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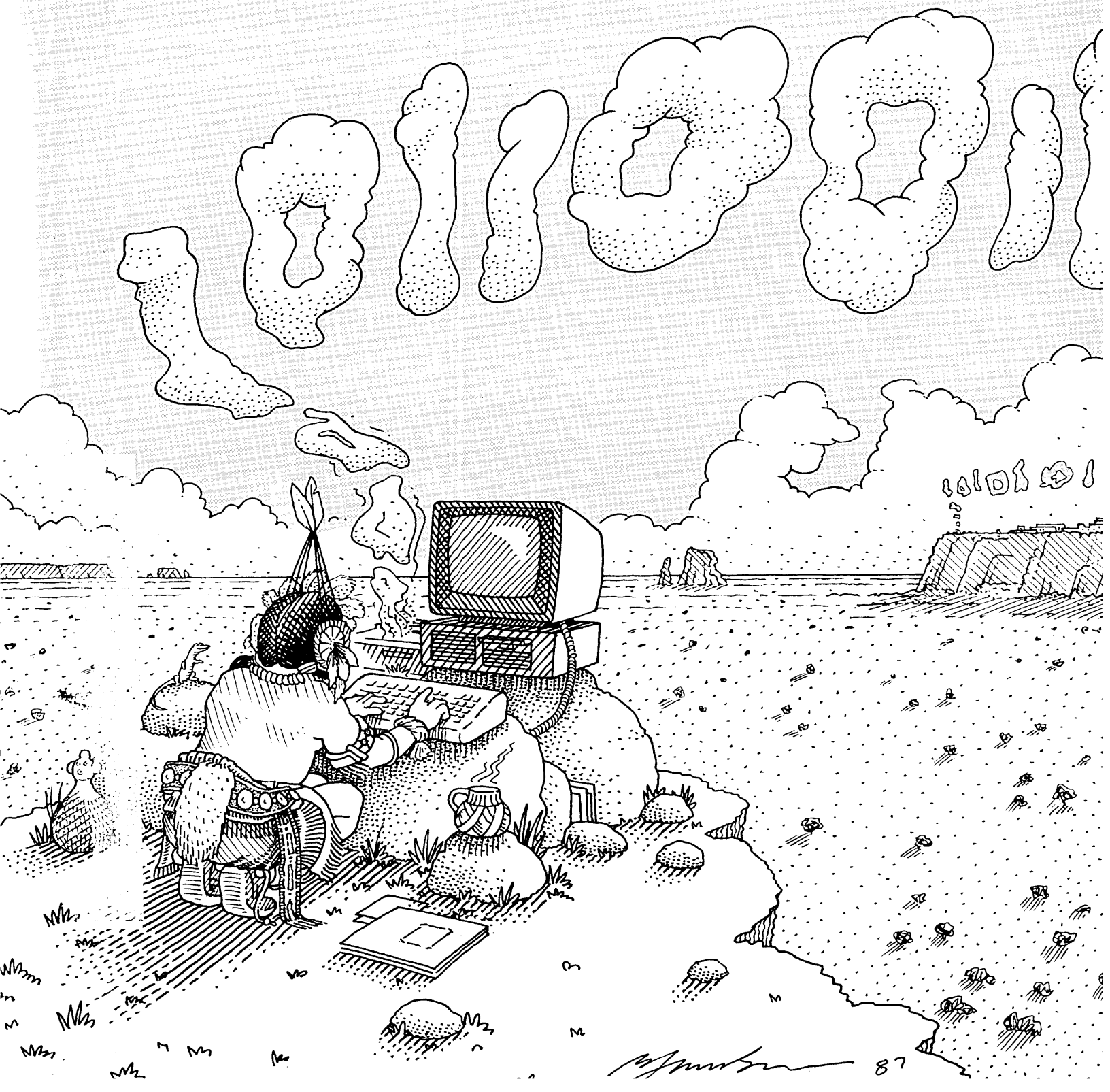
MORROW OWNERS' REVIEW

The International Magazine for Users of Morrow and Other CP/M Computers

Communications



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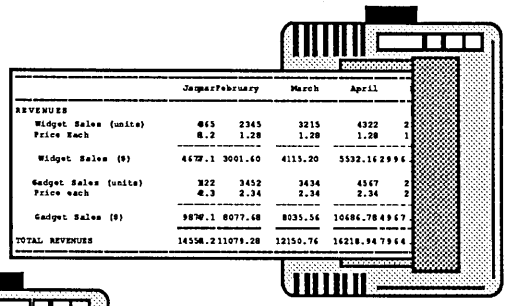

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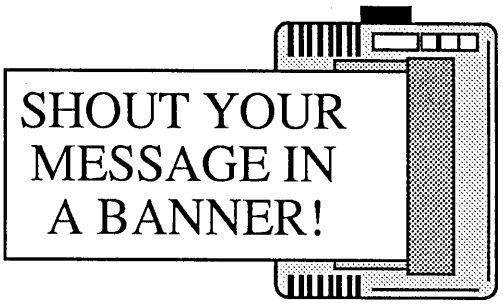

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Letters to the Editor

Waiting for WS 4.0

I'm "desprit" to get the new WordStar 4.0. Please do whatever you can to expedite the CP/M version. I am very happy with my trouble-free Morrow MD2 and do not plan on changing.

Molly Talbot McKinney
Tucson, AZ

(We are in touch with MicroPro and Peter Mierau spoke to a well attended BAMDUA meeting on June 6. Soon we'll try to print a review of a beta-test copy of WS 4.0. In the meantime, keep writing MicroPro about what you want in WS 4.0: ***Lee Lensky, CP/M Update, MicroPro International, 33 San Pablo Avenue, San Rafael, CA 94903.*** *–Ed.)*

Requiem for a Good Mug

At the May 12, 1987 meeting of the Morrow User's Group of Washington, D.C., a vote was taken to disband the group. We felt we could do the most good by sending any money left after paying expenses to MOR to help keep you going longer. You'll get a letter and a check before the first of September. Please continue to keep the high quality of articles and reviews that MOR has delivered. I look forward to each issue.

Robert E. King
Glenn Dale, MD

(It is sad to see you go as it was recently when the Sacramento group terminated operations. Your group put out one of the best newsletters I have seen. I hope your authors will think of MOR when they feel the urge to write CP/M related material. Thank you very much for the "inheritance"; we will put it to good use. --Ed.)

They Shoot Computers, Don't They?

As an owner of an MD-11 and a subscriber to MOR, I read with great amusement your article "They Shoot Computers, Don't They?" (Vol. 4, #3, June/July '87). I would like to obtain permission to reprint this article as a filler item in our humor magazine, the *Journal of Polymorphous Perversity*, which is issued twice a year. Our current circulation is about 1,500. Your article would probably appear under a filler heading such as "Classics in Catharsis."

Glenn C. Ellenbogen, Ph.D., Editor
New York, New York

What the hell is this paean to automatic weapons doing in MOR? Or at least, as an article rather than short "Here's a Weird One" blurb? The country is awash in gun-related murders, NRA is trying to get the Congress to eliminate retraints on the sale and possession of Uzis and Mac-10s, and you guys run a piece about the ecstacies of blowing equipment to pieces! I don't care if it's legal in Georgia.

W.J. Durch
Arlington, Massachusetts

(The Morrow Owners' Review *certainly neither condones nor criticizes the Bullet Stop or the use/ownership of weapons. The article merely presented a semi-humorous, factual story about a place that might interest computer users (or, for that matter, anyone who has ever struggled with hardware of any kind). We try to find interesting topics for the magazine, and it's not always easy. Admittedly, this one was a departure from articles about word processing or C programming, but I felt it would be enjoyed by readers. — Ed.)*

Love My MD2/MD3

Thanks to Greg Smith for sending the new MD3 Rev. 1.1 CP/M distribution diskette so quickly and for explaining the use of the terminator packs, which at first quite befuddled me. Greg's article in MOR was a pleasure to read and the installation process of the DSDD disk drives went without any problems. That menu driven diskette sure made things easy here. It is a pleasure to see 384K of disk space instead of 186 K. I also installed the WestWind 1 Meg RAM card in the machine and programs really fly! I now have a souped up MD2/MD3, thanks to Greg and MOR. Keep up the good work.

Wilmer Hew
Wailuku, HI

Editorial

Our Communication Villages and Ma Bell

Our MOR Bulletin Board System (BBS) — which you can reach at (415) 654-3798 — has developed into an active community. Any beginning BBS is, at first, rather quiet. Gradually, more people call in. Then one day the number of users reaches a critical mass. Suddenly, the quantity of messages soars — and stays up. Another communication village has established itself.

Our little MOR BBS village is almost entirely populated by MOR subscribers and, at the time of this writing, has 167 inhabitants. That represents only about four percent of all MOR subscribers, and about one-fifth of those who own a modem.

Surprisingly, the geographical distribution of callers follows the subscriber demographics quite closely: 50 percent from the three western states and 50 percent beyond. One would think that long distance phone charges would discourage those far away from the San Francisco Bay Area. But maybe those distant callers need the BBS the most. It is still the fastest and most successful way to get help when you need it. PC Pursuit (see page 12 this issue) helps limit the long distance phone bills.

Each day the BBS receives about 20 calls and some 15 messages are posted. The average duration of a call is 13 minutes. This means that the BBS is only busy for a bit more than four hours out of every 24. Weekdays are slightly busier than weekends. While calls come in at all hours, between 30 and 50 percent are placed between six pm and midnight, with Friday night receiving slightly more calls than any other night.

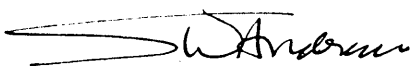
What makes a communication village such as the MOR BBS possible? Personal computers can't take all the credit. They must be linked, by modem, through an extensive telephone system. Just as roads and freeways paved the way for the enormous amount of automobile traffic of today, so the phone system has made possible the 3000 or so BBSs in this country. Weren't we lucky that phone lines were in place and available to everyone when the PC revolution hit?

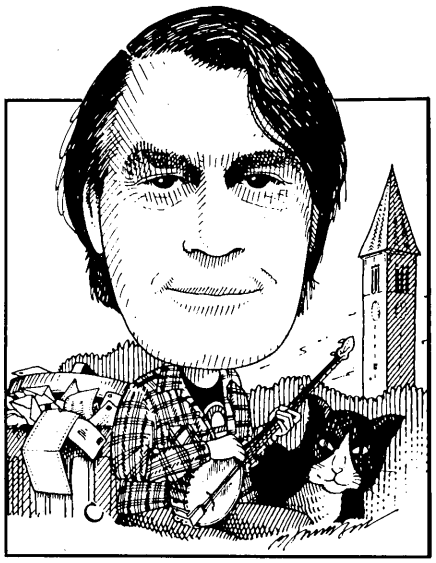
Nonetheless, some people are dreaming of another way to send computer information over long distances. As radio amateurs use computers increasingly, they are actively pursuing the use of radio for computer communication. Read the articles about digital radio service (page 15) and packet radio (page 27). A few ham radio operators are dreaming of nothing less than total independence from Ma Bell and other telephone companies. They paint visions of a national network of amateur stations that automatically transfer message packets among each other until each message has reached its destination. Will this come to pass?

It is a bit like the choice between driving a car and flying a private airplane. To go 20 miles, you take the car. But, if you have to cover 700 miles, it is more fun and faster, even though more expensive, to fly your own plane. So why don't more people fly? Most are put off not only by the expense but also by the time and energy required to learn another skill. Only the small number of car drivers who actually love to fly bother to get pilot's licenses.

We believe that use-patterns in private electronic message traffic will turn out to be similar. Likely the radio hams will have increasing fun with this new computer message medium. But how many computer users outside this small group will be willing to learn the radio amateur skills? How many wish to bother with yet another piece of peripheral equipment? Also, would a computer/radio amateur community be able to standardize frequencies and protocols enough to make a nationwide network feasible and practical?

We feel that, just as private flying supplements car traffic in a small way, so digital radio service and packet radio will supplement the phone-based BBS systems. Like it or not, Ma Bell and her competitors — with their phone lines and their digital services of the near future — will remain the main medium of computer communication for a long time to come.





From the Mailbox

by Bill Steele

ONE of our more prolific correspondents, **Gordon Northrup of Lee, MA,** wants a way to store the address from a business letter and get it back the next time he writes to the same person without having to exit from NewWord, open a database, exit from the database and get back into NW. "Several public domain programs look promising, but turn out to use a whole [2K] file block for one address," he adds. I think the programs Write Hand Man and Presto, both advertised in MOR, might do what you want. Free Filer would let you find an address from just the name and write it to a file, after which you could open that file and write your letter in it. To do this without buying any new programs, there are a couple of possibilities.When you write the second letter, open the old file, delete everything between the salutation and the closing, and write your new text in between. If you prefer to keep the old file, open a new file, copy the old one into it, and proceed as above. Often when I write a letter I copy the address out as a block to a temp file, then later copy that into a file called "SENT" (I also include the date, so I have a record of when I wrote to that party). Later I can open SENT, copy the address I want out of it, exit with ^KQ, open the file with the address in it and write my letter around it. None of this works well if you've got too many letters or addresses. Anybody out there know of a public domain program that will really deal with this?

We're more on our own than ever, so if you know a solution to a problem, don't assume someone else will write in; there are not so many of us that you can count on that. Whether you have questions or answers, keep them coming: ***Bill Steele****, P.O. Box 782, Ithaca, NY 14851, 607/273-2132; MCI: WSTEELE, 254-5833.*

Richard Rose of Petaluma, CA has been using his MD3 with Anchor's Signalman Mark XII modem and Telepath-80 communications program, release 2.4. "When I moved the system from my office to my home I started getting garbage characters-not just a few characters but dozens and dozens, with beeps and Ctrl-L's and J's, in spurts. Apparently transmission out from the terminal was normal. It doesn't happen all the time, and the number called, time of day, weather, temperature of the hardware doesn't matter either. The modem was checked O.K. The telephone lines were checked at the central office and also O.K." My money is on the phone line. Noise on the line or very brief interruptions would produce garbage characters. One way to find out for sure would be to test your phone line with someone else's computer. I've had problems with incoming voice calls for a couple of months. The phone company has "tested" three or four times without finding anything, yet the problems are still there. Call them again and jump up and down a lot. If no satisfaction, complain to the Public Service Commission.

Mr. Rose also asks how he can enter a new business name into Quest. Quest is out of business, but as the the Aug/Sept '86 MOR reports, support has been taken over by the James River Group, 125 N. First St., Minneapolis, MN 55401, (612) 339-2521.

Inspired by the problem of swapping disks between his MD3 and his son's Commodore 128, **Dave Good of Merritt Island, FL** has rewritten OSB.COM to read and write SSDD disks. He sent along a copy of the assembly language listing, which I'll forward to anybody who wants it for the usual fee-an SASE plus 60 cents to run the six pages through the copy machine. We'll try to get it on a FLOB. Thanks, Dave.

Arthur Sherburne of Hollis, NH reports a problem with NULU, the library utility, on FLOB/Aug 85. When he tries to open a library, he gets "error 77, not enough memory." He's blaming this on a lightning surge that hit him last fall, but says all his other software works fine. My guess is that this is the program's way of saying "not enough disk space." FLOBs tend to be crowded. Try copying NULU.COM and the library file you want to open onto an empty disk and try again.

Last time we reported **Lewis Parkhill's** problems getting his MD3 to run a Teletext 1010 printer. Turned out the printer was running at 9600 baud but the computer was sending at a slower rate. Running SETUP cured the problem. General principle: using DIP switches to set the baud rate on a printer (or terminal or any other

peripheral) isn't enough. You always have to set the baud rate at both ends of the link.

Roslyn Lian writes all the way from **Australia,** "I have discovered it is not possible to insert control characters as part of a correction while running Correct-It. The checker will not recognize words that have control characters in them. [Therefore] foreign language words cannot be entered in the dictionary." There's no solution for this; it's just a limitation of Correct-It. The question is, does anyone know of a spelling checker that will handle the combinations of letters and control characters we get when printing foreign language words (e.g., pin^H~ata) in WordStar and NewWord? I would think MicroPro's own, SpellStar, should do it, but since I've never used it I don't know.

Ms. Lian also passes on a tip: in NewWord's MailMerge, "if a request for data using the dot command .av is very lengthy, there is not much space left on the screen to enter the data. If the data is also lengthy the cursor will jump off the screen and the program will jump back to CP/M." In other words, one screen seems to be the limit.

Gerald Merryman of Ashland, OR writes in with a problem that sounds familiar. His Brother M-1709, which is supposed to emulate an Epson FX, won't work with NewWord installed for Epson. After a ".cw10" command for 12 cpi printing it switches to 17 cpi, "and the print head dances back and forth energetically." This sounds a lot like a problem with Gemini printers we discussed in this column in MOR Vol. 3, #1 and #2. But if Ann Landers can do reruns, why can't we? The dancing is caused by the printer switching to graphics mode to do microjustification, and the answer is to turn microjustification OFF, either with the dot command ".ujoff" or by reinstalling NW to come up with it off. No one reported getting the wrong size print, but did have page offset problems when switching print size; that was solved by reissuing a page offset command after the character width change. You might try using the ^PA (alternate pitch) command instead of ".cw" to change width, making sure that the correct codes are patched into that command's slot in NW-look up the escape codes in your printer manual, then patch them in through the "Special Patches" menu of NWINSTAL. One other thing to check is the setting of the DIP switches on the printer, which establish which size it regards as default and which as alternate.

Glenn Ellenbogen of New York City has some hard disk questions and a warning. "I have heard it said that if you're going to leave your computer for an hour or so, don't bother shutting it off, as this only causes greater wear and tear. Wouldn't it make sense to put the computer in PARK, in case there's a power failure? And how do you get the computer out of PARK when you come back? My guess would be to hit reset." Correct. In fact, when you run PARK you should get a message telling you that. See previous issues for discussions on the relative merits of turning the computer off; the consensus seems to be that for two hours you probably should leave it on.

Mr. Ellenbogen also reports that once he turned off his computer, then remembered something he hadn't done and quickly turned it on again. "There was a crackle, a poof of smoke, and the machine was dead; the power supply had blown. The repairman informed me that one of the cardinal rules is, *NEVER TURN A HARD DISK ON UNTIL SEVERAL MINUTES AFTER IT HAS BEEN OFF.* Nowhere had I heard a warning about this." Our own Greg Smith says, "It's not supposed to happen, but I've heard of it," and "Always do what the repairman says."

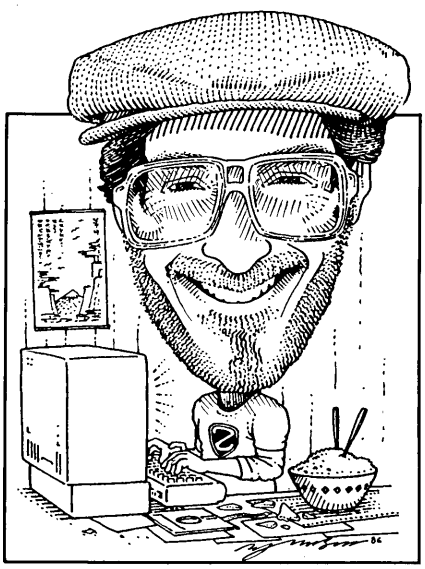
Finally, Mr. Ellenbogen finds that BACKFIELD puts extraneous characters into Pearl files. This is probably a very early version of BACKFIELD; the MOR office has been using the latest version with no trouble. You can order the new version from MOR for $12 and your old distribution diskette.

Speaking of leaving the computer turned on, I get inquiries every so often from MDT-50 owners who envy the automatic screen blanking feature of the MDT-60 and MT-70 terminals. (For those who haven't thought of it, you don't want to leave your terminal on for a long time with the same display, or the letters could be "burned" into the face of the tube.) Here's an only partially satisfactory solution. The following MBASIC program will blank the screen until you press any key. (Fig. 1)

```
10 REM BLANK SCREEN PROGRAM
20 B$=CHR$(27)+CHR$(46)+CHR$(49)+CHR$(27)+CHR$(43)
22 U$=CHR$(27)+CHR$(46)+CHR$(50)
25 PRINT B$
30 K$=INKEY$
40 IF K$="" THEN 30
50 PRINT U$
55 SYSTEM
60 END
```

Figure 1

Disadvantages: 1) The overhead of having MBASIC.COM on one drive. If you have a compiled language like Turbo Pascal, rewrite this and compile it down to a COM program. 2) You can't run it from inside another program, except from the "R" option of WS or NW. Maybe someone out there will write us a memory resident version. I believe Presto, mentioned above, also contains a screen-blanking feature.



Forever Z

By Rick Charnes

I very much appreciate all the letters I've been getting with the large number of excellent suggestions. This is the stuff of which real communication is made and makes being involved in this Z- adventure such a joy. Please continue to send mail to the MOR office and phone calls to my home. Something as delightful as Z-System as life in general feels best when done with the support of a concerned, vital, passionate and enthusiastic community, and that is what we are building here. Whether by BBS, phone network, or mail, staying in touch with and learning from others fundamentally enhances the pleasure and meaning of the entire computing experience. Communication and understanding, remember, were the great promises of the computer revolution. Let's work to make that a reality and take it away from those who would use computers primarily as a tool in their plans for military armament as they bring us closer and closer to global holocaust.

One of the odds and ends culled from discussions on the MOR BBS was a question about error handlers. Error handlers are a little used but very powerful Z-System feature. If you're a less than perfect typist and are tired of CP/M's "????" response when you type something it finds incomprehensible, then error handlers are for you. When an error handler is "installed" in your system and ZCPR3 cannot understand what you've typed in, you're then in the words of Jerry Maloney, error handler enthusiast in Boston,"given a second chance." Simply correct your typing error, hit <CR>, and your command line is run again. I'm not aware of anything comparable to this in the MS-DOS world.

This may not seem so important for those used to CP/M 2.2 with which only a single command may be typed on any one line. Remember, however, that in ZCPR3 many commands may be strung together, separated by a semicolon. I take advantage of this feature as often as I can. If you have a series of commands to run that you don't use very often and therefore for which an alias is not appropriate, simply type them all together at the ZCPR3 prompt. This can be very enjoyable and can save a lot of time especially on floppy systems. Rather than sitting staring at the screen while I am waiting for the results of one command before I can run the next, I often try to anticipate my next several moves and type in as many commands as I can foresee into the future. For instance, if I'm cleaning up my disk and then want to rename a file before working on it I can easily find myself doing something like:

ERASE *.BAK,MARY.LTR;REN JOE.LTR=JOE;NW JOE.LTR

This may look difficult and confusing but if you study it you'll see it's quite straightforward and is a real timesaver. You may find it an enjoyable challenge to discipline yourself enough to anticipate and plan out your next few commands. In this example we take advantage of a capability of many ZCPR3 but not CP/M utilities, that of accepting a **file list** parameter. Here, ERASE.COM is given a parameter of:

"*.BAK,MARY.LTR"

... a list of two files, one ambiguous and one unambiguous, separated by a comma. A quick browse through *ZCPR3: The Manual* will reveal that a dozen or two utilities have this ability. After ZCPR3 has erased these, JOE is renamed to JOE.LTR and then loaded in with NewWord. It's our multiple command line feature that permits us to do this.

But to my point: with long command lines such as these typing mistakes happen rather easily! Enter error

---

Rick Charnes bought his MD-2 many years ago when he thought of himself primarily as a writer. Now a self-admitted fledgling technical type, his computer has turned from tool to toy. His immense love affair with ZCPR3 leaves some occasional time for mundane things like work. He is president of BAMDUA.

handlers. The most common error handler is VERROR, for Video ERROR. To install VERROR, simply type "VERROR<CR>". From then on VERROR is "installed." From then on, anytime you make a mistake, or anytime any of your VFILER or other macros contain a mistake, your error handler is invoked. You are then put into a one-line Wordstar-like editor within which you can then use all the familiar cursor motion commands to correct your input anywhere on your command line. When finished, simply hit <CR> and your command(s) are sent out again.

One warning, though: With ZCPR3.0 you cannot be running an extended command processor such as ARUNZ if at the same time you have an error handler installed. With the new ZCPR3.3 this problem is remedied.

By the way, if you're feeling that you never manually string a series of commands together on the command line and can't imagine why you would ever want to do so, here's an easy one to start out with in order to see how much time you can actually save. Suppose you're on one directory and want to log on to another, do a disk directory, and then perform various operations from there. If you're on A0: and want to work on B0:, without ZCPR3 you would type "B0:<CR>", wait for the system to log you in, then "DIR", etc. Instead, try simply "B0:;DIR<CR>". Why complicate matters with an extra carriage return and a wait, when you could be having fun watching the computer do all the work for you?

I can hardly believe I've let three columns come and go without a mention of the famous "POKE 'N' GO" technique. This is one of the very nicest features of Z-System, something that you easily run the risk of taking for granted. It's especially useful for saving disk space on floppy systems. Suppose you normally run WordStar or NewWord in single space mode and a right margin of 65, but occasionally use double spacing and a right margin of 78. You are tired of having to remember to manually type in your "^OS" to change the spacing, set your new ruler line with "^OR", and finally put in your ^PA code to change the printer pitch to 12. I always end up forgetting to do this when using settings other than my default and find it extremely frustrating. One solution of course is to make a completely new WS.COM or NW.COM disk file with these new settings, but with disk space precious this is silly. With Z-System's alias-making capability there is an easy solution.

Let's take the above situation and see how we can handle it with ZCPR3. The first step is to find the exact patch points in our *.COM file where the values for line spacing and right margin are held. This is done with NewWord by extracting the information from the relevant section in the "patch menus" in NWINSTAL.COM, and with WordStar from one of the many public domain docs providing this kind of information. To set NewWord 2.16 to the above values we find that 0762h should be set to 02, 0713h to 4e (4eh=78 decimal) for the ruler line, and lastly both 0721h and 0723h should be changed to 0A to modify the standard printer pitch from 10 to 12.

Now for the beautiful part. Make either a free-standing alias using our trusty VALIAS or BALIAS or my preferred method an entry in your ARUNZ.CMD, as follows:

```
GET 100 NW.COM
POKE 0762 02
POKE 0713 4E
POKE 0721 0A
POKE 0723 0A
GO $1
```

With ARUNZ/ALIAS.CMD all this is strung together on a single line separated by semicolons, beginning with its name. I have called mine NW78. Here's what happens: in Z-System we have a memory- resident GET command. GET is one of those seemingly arcane features that really performs when called on. It will load the file given as its second parameter at the location in memory given as its first parameter, but *without running it.*. We here load NW.COM at 100 hex, the spot in memory where all COM files load when they run. But here it doesn't actually run; it simply is suspended there, awaiting further instructions. Now we use ZCPR3's resident POKE command, which CP/M also lacks. "POKE 0762 02" will insert the hex value 02 at memory location 0762. Since we have loaded NW.COM into memory we are in effect patching NW! Then GO is the final memory-resident command used in our holy Trinity. GO takes whatever is sitting there at 100 hex and runs it, and the "$1" is of course the name of our file to be edited.

Suppose we wanted to work on our file JOE.LTR. At the ZCPR3 command line we simply type "NW78 JOE.LTR<CR>" and sit back and watch. Our command processor gives us a pleasing visual display of all this POKE-ing, NewWord loads, and we find ourselves in JOE.LTR, double spaced, margin set to 78.

You can have as many of these POKE 'N' GO aliases as you like, setting your word processor to as many default values as you like. Disk space used for all this sophistication? If entered as an entry inside your ALIAS.CMD, 0k.

A couple of notes inspired by letters I have received: the Morrow KEY.COM will not work with the hard disk Z-System. The Morrow BIOS was reworked much more fundamentally than the floppy version in order to Z-ify it. A decision was made in its development that the amount of space KEY.COM took up in the BIOS was not justified by what it did, that this space was more important used elsewhere. Backgrounder II, which has

an extensive key redefinition capability, or Echelon's NUKEY are the programs of choice for hard disk users.

Some confusion has developed about the public directory feature. The best way to learn about it is with the PUBLIC.HLP file on the Z-System disk. If you're logged onto the same drive but a different user area than your public directory, DO NOT create a file with the same name as a file on the public directory. Z- System will assume you are working on the public file and will make any changes to it that you make to your file, such as deletion, etc.

Another caution: declaring a directory public in Z-System works only for all user areas *on that drive*. In other words, if you are logged onto D6: and your public directory is A1:, everything that goes on in your A: drive will have access to the files in A1:, but do not expect your files in A1: to have anything significant to say to operations running on your D: drive. However, there is one "out" here: in their search for overlays, a small number of programs, most notably WordStar, have enough smarts to check also on drive A: of whatever user number you're logged into if they don't find them on the current drive/user. So in our case putting the WordStar overlays into a public directory on the A: drive will do an yeoman's job of servicing your entire system. Other programs, however, such as Correct-It and SuperCalc as I mentioned last time, do not perform this "search on A:" operation and must be dealt with otherwise. Very briefly, an alias should be set up in which the very first command logs on to drive A: of the currently logged user area. Then the source file is accessed from drive A:. I have created a number of aliases that are available on the MOR BBS that deal with this problem.

I'd like to emphasize how much easier and quicker the utility VFILER makes running your entire computer operation, in the time it saves lost to typing errors. Without VFILER, if you have incorrectly typed the name of a file to be edited, for instance, time is wasted retyping your command line. With VFILER and the macros you have written, simply position the pointer on your target file, and hit the macro number or letter. "Point and shoot," as Ted Silveira very appropriately calls it. Nothing could be simpler.

One final comment about VFILER. The command recall and editing program HSH will not and cannot be made to work when running programs from its "Z" option.

As I write (early June) ZCPR3.3 has been released, written by the extraordinarily prolific Jay Sage of Boston. One of the features I like best about it is its incredible flow control package, with more "IF options" than one could possibly imagine. In addition to the "IF INPUT", "IF EXIST," "IF NULL," etc. that we've all come to use and love, it is now possible to test if a file is compressed (squeezed or crunched), ambiguous (wild cards present in the name), and for the presence of any of the three file attributes: system, read-only, and archived. We now welcome IF COMPR, IF AMBIG, IF SYS, IF RO, and IF ARC to an already packed Pantheon of conditionals. Additionally, we now have two entirely new commands related to "IF": "AND" and "OR." As an example of their use, Z-System aliases are traditionally set up so that help messages will display if the user enters the command with either a "//" parameter or no parameter at all. To create an ARUNZ entry for our by-now classic "COPY" alias to do this our line used to have to read:

```
COPY IF //=$1;ECHO SYNTAX:
"COPY [SOURCE]
[DESTINATION]<CR>";
ELSE;IF NU $1;ECHO SYNTAX:
"COPY [SOURCE]
[DESTINATION]<CR>";
ELSE;CP $2=$1;FI;FI
```

Whew! How boring. Now we need only enter:

```
COPY IF //=$1;OR NU $1;
ECHO SYNTAX: "COPY [SOURCE]
[DESTINATION]<CR>"
ELSE;CP $2=$1;FI
```

One other feature of ZCPR3.3 for which alone I would want it is its memory-resident ECHO command. It can finally display lower case characters. I've always felt the upper-case only ECHO-ing looked silly and infantile; we now have the capability to make professional-looking displays, status reporting messages, etc.– a very important part of every fully-utilized Z-System.

Contact MOR for the terms of a ZCPR3.3 upgrade.

By the way, I recommend that you start writing aliases with either VALIAS or BALIAS (or, of course, as I will never fail to suggest, ARUNZ). I recommend you not even touch ALIAS.COM; this program is very much outdated.

More news on the Z280 front. I just learned of this a few days ago and know very little about it, but there is a company by the name of Zedux in Van Nuys, California that apparently manufactures a generic Z280 add-on board. And as if that weren't enough to get the adrenaline going, the real shocker to me came as I browsed through their documentation: they have a genuinely multi-tasking operating system already written for it as well. I know nothing more than what I've read, and merely pass on the information to you. I immediately sent them off a missive requesting more information and a possible Morrow beta-test, but for those whose interest is as piqued as mine their address is 14402 Hamlin Ave., Suite #C, Van Nuys, CA 91401, telephone (818) 787-0113. This could be a real gold mine.

I hope your summer is going well. Z you next time... ■

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ALL SYSTEMS CUSTOM ASSEMBLED, INTEGRATED, and TESTED

Tools for Tyros

by Mike Allen

PROBABLY the most frequent class of question I get asked normally boils down to software installation. "How do I get my SuperBlivit3 program to clear the screen with a CLS command" or "Why doesn't my printer change colors when I give it a ^PY from WordStar" are typical questions of this category.

Speaking of questions, I need some vital information if I am going to try and answer your questions. The biggest thing I need to know is what model MD you are using. I also need to know what ROM and BIOS versions you are using. When you first turn the computer on you will get a message that tells you the ROM revision. After the memory test you will get a CP/M sign-on that identifies the CP/M version number (2.2 or 3.0) and then the revision number which is the BIOS revision. If you are asking questions that relate to the terminal, printer or modem I need to know the manufacturer and model and, in the case of printers, whether you are using serial or parallel interface. As far as software, the same thing goes. A lot of the questions about NewWord, for instance, could be traced to the fact that you aren't using version 1.32 or 2.17. There were a lot of buggy versions that got out.

*Send your questions and comments to **Mike Allen** at 400J Summer Wind Way, Glen Burnie, MD 21061.*

What is software installation and why do we need to do it? Well, that's a fair enough question. As I mentioned earlier CP/M went a long way to insure that software could run on many different machines. However there was no standardization of peripherals. Different terminals can do different things as can different printers. Also the number and storage ability of disk drives vary from machine to machine.

Rather than try to make software that could take all these variables into account (which would probably make a HUGE program if it could even be done) software manufacturers took two different approaches. Programs like MBASIC assume that terminals and printers can do no fancy things and hence don't try. Other programs like NewWord allow you to tell the program what your printer and terminal can do. This is called installation and is normally only done once (when you get the program) unless you change something.

The advantage to non-installed software is that it is ready to go as soon as you run it however it won't take advantage of all the neat things your printer or terminal can do. Installed software takes advantage of the features of your terminal and printer. That means, for instance, that underlined text shows up underlined on your terminal when using NewWord version 2.xx. You can use the italics capability of your printer.

Many software manufacturers also allow you to tailor the software to your own particular tastes. Most word processors allow you to set up what level of menu to use, whether to be in the document or non-document mode, etc.

There are basically three methods to install a program. The easiest to use is actually a separate program that gives you a bunch of menus and choices. Then it will modify the actual program for you. NewWord, WordStar, SuperCalc and LogiCalc are like this. Their installation programs are NWINSTAL, INSTWS, INSTALL and LCSET. These programs are well documented within the manual that applies to the particular program. The secret to using them is planning.

The second method also uses an installation program, but instead of be-

ing menu driven it gets its inputs from a pre-prepared data file. Personal Pearl is of this type. Its installation program is called WELCOME and the data file is called INSTALL.DAT. To install this type of a program you need to edit the data file using a word processor in the non-document mode. Again the secret is planning.

The third method requires making actual changes to the program using a program supplied with CPM, DDT (or SID with CPM 3.0). This is not a job for a beginner, but it can be done with patience and planning.

Morrow realized that installation was a messy task at best and one that the novice user may not be up to. Some soul (bless his pointy little head) decided to automate this process for us. This was done when you first turned your MD on and it ran a program called INIT. If you remember back that far the program asked you how many disk drives you had, what type terminal and what kind of printer and whether it was parallel or serial. It then proceeded to run the installation programs for all the supplied software.

There are just a few reasons that we should need to run the installation program for our software. The most obvious one is that you've gotten a new or upgraded piece of software. Another is that you've changed some hardware, like getting a new printer. Finally you might decide that the present installation is not quite suited to your purposes. For instance you might want NewWord to come up with the insert toggle turned off. If you fit any of these categories by all means re- install your software, but PLAN IT OUT FIRST!

I guess by now the message of this column is obvious; plan, plan, plan. The people who gave you NewWord think it important enough that they gave you forms in the manual that you could fill out ahead of time.

The first thing to do is read the section in the software manual about installation. It may be hidden in some obscure appendix, but it is probably there somewhere. NewWord gives you an entire section called Nuts & Bolts as well as appendix B of the NewWord Encyclopedia. Personal Pearl hides it in appendix C of the Reference Manual. SuperCalc puts it in appendix C of the User's Guide. LogiCalc is in appendix B of the User's Manual. I don't have WordStar, so I don't know where it hides there, but I'm sure it is there somewhere. Borland, (bless 'em) puts a quickie instruction right up front in Turbo Pascal (page 12) and then gives a very good discussion in appendix L.

The next thing you have to do is decide what you want to do. If you are installing for a terminal, see if it lists your terminal in the choices. If not, try an ADM-31 and if that doesn't work, try an ADM-3A. The exception to this is a NewWord 2.xx upgrade. Do NOT change the terminal installation since it has been customized for Morrow MDT-60/70 terminals so that underlining and bold print will show on the screen.

Printers are a little messier. NewWord gives you a menu of printers to choose from. If your printer isn't on the menu, check your printer manual and see if it acts like (emulates) some other printer. Your dealer may be able to tell you, but don't count on it. With NewWord you can always drop back to the DRAFT or SIMPLE printer, but you loose so many goodies that way.

Other programs, like WordStar, don't have specific printers supported but expect you to 'patch' the program from the installation program. This is much like using DDT. Patching and the use of DDT for patching will be next issue's column.

No matter how you look at it, the secret is to plan out what you want to do. If you are installing for a printer or a terminal read the manual on the printer and manual and see if it will do what you want it to. No need to try and install italics for your printer if it can't do it. See if your program supports your terminal or printer by name. If it doesn't, try and find out if your device acts like one of the devices it does support. Finally become familiar with what you can do with the installation program. This might take some digging but the information is there somewhere! (Maybe)

Now I know people are going to say 'all he's told me to do is read! I wanted to know how.' That is true. It would be impossible for me to cover all the different permutations and combinations of hardware and software that is out there. I could go into a step-by-step description of how to install NewWord 2.16 on a 4 drive MD-3 with 3.1 ROM and bios, a MDT-60 terminal and an Epson MX-80 with Graftrax+ (my system) but how many people would that actually help. Even if there were bunches of people out there with my same system, no two of us could probably agree on how we wanted NewWord installed.

The bottom line is that you will have to try a few times yourself before you start to feel comfortable with the installation method. By doing it yourself (with help when you hit a serious snag) you will learn a lot and be prepared for the next time you want to install some software. The only thing to remember is work on a copy. You might screw something up, but if you do it on a copy, who cares? Also by digging through the manual you might discover wondrous things that you didn't know.

When you hit snags, ask people. If there are no Morrow people you can tap locally, there is always MOR. If you have a modem and a modem program running call the MOR BBS. There are lots of smart people who are more than willing to help. You can always write MOR or any of the columnists. (A SASE is appreciated.)

Having said all this let me add that if there is sufficient interest displayed, I will be glad to go through any specific installation programs (that I have) in a future column. Just let me and/or MOR know. See y'all in a couple of months.

Telenet's PC Pursuit

Big Business Telecommunications Reaches the Consumer

By Jim Bottom

THE information revolution got new artillery when Telenet's PC Pursuit came on line less than two years ago.

The flat-fee, packet-switching telecommunications system for personal computer users is bringing the revolution home, offering affordable means to reach electronic bulletin boards and on-line information services from the comfort of one's Morrow, IBM, clone or Kaypro. The significance of home information retrieval might go unnoticed for the present as the Telenet toddler grows out of its infancy. And, a Federal Communications Commission proposal to add as much as $5 an hour in access charges to computer-based services next year threatens to place the revolution back in the exclusive hands of business. In the meantime, those growing numbers of PC users who have discovered this cheap, alternative hook-up to the outside world are themselves hooked. Let's face it. Few services in our dubious "service economy" actually cost less the more you use them. PC Pursuit does. And, though far from perfect, telecommunicating is just plain fun as well as functional.

For a $25 start-up fee and $25 per month billed to a Visa or MasterCard charge card, PCP users have 24-hour access — though the flat fee covers only evening and nighttime hours — to 25 major cities through more than 450 local access phone numbers. That means you can reach big-city bulletin boards and computer information exchanges locally from such well-known burgs as Deadhorse, Alaska and King of Prussia, Pennsylvania.

And the list is growing."We just expanded into eleven cities, so I don't think we'll be expanding any more this year — though I can't guarantee that either," says Beth Kirkwood, telemarketing representative at Telenet's Reston, Virginia headquarters. Kirkwood says Telenet's primary business isn't serving weekend hackers. The reason the rates can be offered so cheaply, she says, is because the public data network is already in place, used during peak business hours by major mainframe operators. PC Pursuit is designed to go on line when businesses shut down for the day.

That doesn't mean you can't use PC Pursuit during the day for your own small business. For a reduced fee over what normal prime-time telephone usage costs, or $10 to $14 an hour, you can have access to the same packet-switching as the "biggies" of Wall Street.

What is packet switching? It's a interconnected system used daily by hundreds of companies operating centralized computer systems linked to branch offices, like those bank branches in your own home town. These businesses use a local node or connection point that's hooked into a special long-distance network. The branch office calls a local number that passes the call through one node of the packet-switching network to another to reach the firms central computer.

How does it work for the PC user? Registered users call a special local access number, if available, using a modem, and of course their Morrow, IBM, clone or Kaypro. According to Kirkwood, many living outside the local area of an access number can still keep their computer's telephone bill below the national debt level using PC Pursuit. She says in many case the long distance charge to the access number should be offset by the reduced packet-switching system rates.

When you are connected to the local node's modem for the first time, things can be a bit confusing. A couple or three carriage returns, brings forth a prompt where the user enters his or her PCP access code, the area code being called, password and transmission baud rate. Following this the user enters the number of the bulletin board being called. There are many digits to dial, unfortunately, and PC Pursuit is anything but forgiving. Make one keyboard error and you must start the entire process over again — and again.

Fortunately, in the true tradition of PC hacking, there are already several excellent programs available that automate the entire process, even to continually redialing "busy" numbers. One of the best of these is a program called PCPIMP, which is not a modem program, but a auto-dialing program to be used with IMP, MEX, or other modem software.

PC Pursuit does have some serious limitations. It's own growing popularity is one. As more users join the information revolution armed with PCP,

Continued on page 14

Jim Bottom is a science writer and free-lance journalist with a background in advertising, public relations, photojournalism and now, with three CP/M compatible machines, computing. He lives in Salem, Oregon.

PC Pursuit is Worth Its Weight in Phone Bills ...

By Jon Koerner

PC PURSUIT is a service offered by Telenet for personal computer owners who frequently communicate long distance with bulletin board systems (BBSs) and remote computers (RCP/Ms). If you, as I do, frequently connect with the MOR or BAMDUA (or other) BBSs from across the country, using either AT&T or some alternate long distance telephone service provider, you have probably found that your phone bills increased at a remarkable rate as you became more "addicted" to the capabilities of computer communication. I was often spending $50 to $75 per month for long distance "BBSing." Thanks to PC Pursuit, I now spend only $25 per month for virtually unlimited long distance computer communication.

Further information on PC Pursuit (PCP) is available through their own toll- free BBS (800-835-3001, or 703-689-2987 in Virginia), although you will often find it busy. You can get further information, and also sign up for the service, by calling a PC Pursuit representative at 800-835-3638 (703- 689-5700 in Virginia). I will provide a brief summary here to acquaint you with the basics so you can decide whether this service might be beneficial to you.

The cost of the service is a one-time $25 registration fee, plus $25 per month thereafter (whether you use it or not). There is a local phone number in most major cities in the U.S., which you call to initiate connection with your desired BBS. That local Telenet number routes your call (over dedicated, relatively noise-free lines), to your destination city ("node"). There are currently 25 PCP "node" cities (a node is a city, or area code, where PCP has equipment to receive your call and route it to a local BBS). These 25 cities (and the number is expanding) presently include: Atlanta, Boston, Chicago, Cleveland, Dallas, Denver, Detroit, Glendale, Houston, Los Angeles, Miami, Milwaukee, Minneapolis, Newark, New York, Philadelphia, Phoenix, Portland, Research Triangle Park, Salt Lake City, San Francisco, San Jose, Seattle, Tampa, and Washington, D.C.

I signed on with PCP in late February, and for the first three months wasn't happy with it because the 415 (San Francisco) area code "node" was usually busy. That is, this node, which allows only so many callers through simultaneously, was usually full. I complained to PCP Customer Service several times about it, and they then expanded the node's capacity. Even after they had done so, it didn't seem to help. I would call multiple times per night, even up to 4:00 AM or so, and find it busy. And the log on procedure is time consuming, only to then find you can't get in. So I was paying $25 per month for basically nothing. I did connect a few times, but not as often as I would have liked.

Then, in May, I downloaded a public domain program from BAMDUA called PCPIMP (this works with my favored modem program, IMP; there is also a version for MEX users). This automates the log on process, and will do continuous tries until the node frees up and you connect. The 415 node, as always, is usually busy on my first attempt, but it then continues retrying until it connects. This can take anywhere from 1 to 150 retries (approximately 3-6 per minute). So I just do something else that doesn't require the computer (it is tied up) in the meantime.

Conclusion: With PCPIMP, PC Pursuit is worth the bucks. It is not perfect, but it is worth the $25-50 savings I'm getting and actually I'm saving more than that, because now I'm calling in more than before, when I was paying AT&T. I cannot speak about the 24 other "nodes" that you can connect with through PCP: I don't call NY, DC, Chicago, etc. (However, I have been told that the San Francisco 415 node is the busiest one, so this may not be as much of a problem with calls to BBSs elsewhere.) I do plan, however, when I have a bit more free time, to explore BBSs elsewhere, now that it is not so costly to me. The most important thing for me is connecting with BAMDUA and MOR, they are my life-support system with the Morrow, and PCP has helped me stay in close touch with them. I would recommend PCP to any BBSer who is consistently spending over $25 per month on BBSing. Good luck.

more favorite bulletin boards like MOR BBS are becoming harder to connect to.

You can't monitor your calls with a speaker because the call is really going through several modems, your own modem not being directly connected. Therefore, you can't hear the recorded announcement telling you a number has been disconnected or changed. While PCP will tell the user "busy" when the call can't be connected, you have no way of knowing if the destination modem is even on line. (There are ways around this using the PCP Racal-Vadic command set instead of the Hayes commands, but this takes a little experience.) A constant "busy" from PCP could also mean the BBS you are calling is not within one of the 25 PCP city areas.

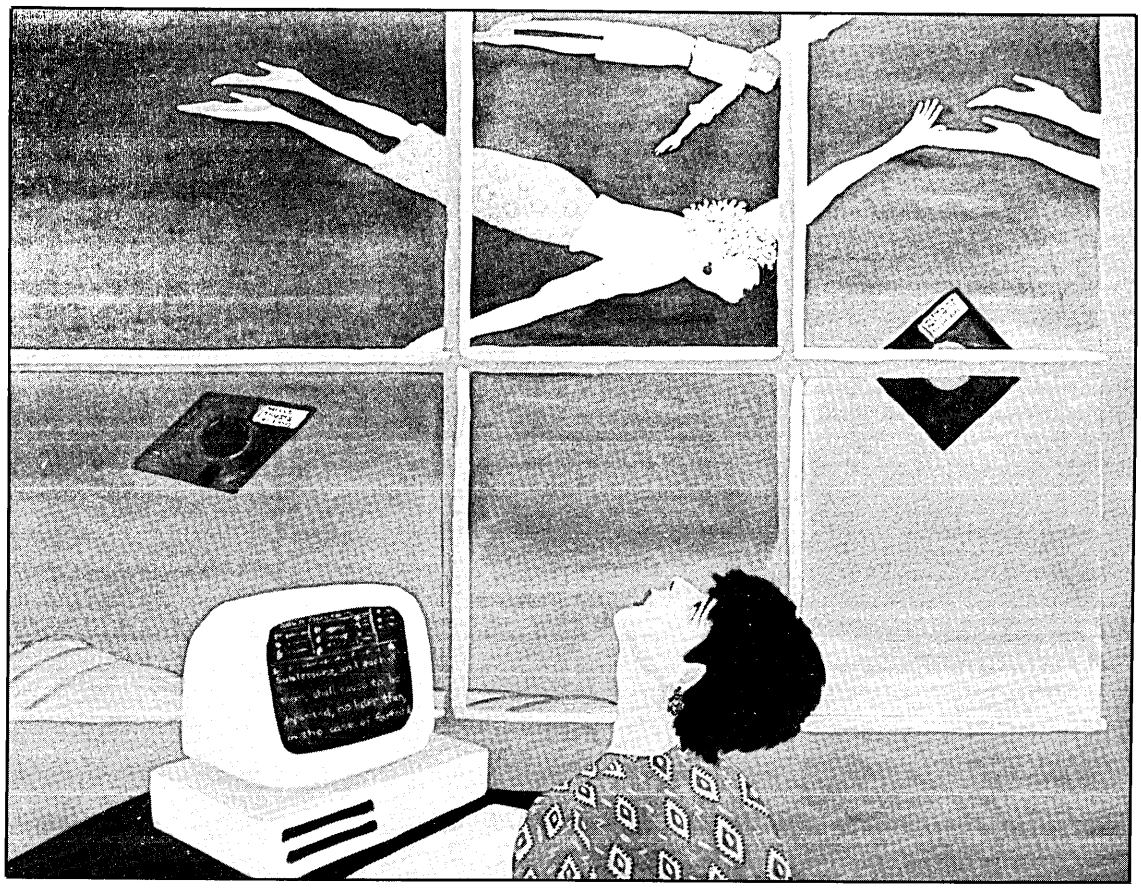
Also, packet switching effectively reduces the speed of telecomputing, particularly to busy node areas like San Francisco, the Morrow Mecca. While you may be sending or receiving data at 1200 bits per second, the effective transmission rate may be nearly half that speed. That's important to callers to those bulletin boards that have tight time limitations. Some file transfers may take up that entire period.

User support from Telenet is still somewhat lacking, though there are toll-free numbers for registration and information (1-800-TELENET), customer service (1-800-336-0437), online guide for users (1-800-835-3001). After all, the service is, at this point, still only a stepchild to Telenet's business data network. A user bulletin board called Net Exchange (703-689-3561, or for customers by typing "PURSUIT," your user ID and password at the Telenet/PCP prompt.) provides user-to-user support.

"That's for our users to be able to access in case they have uploading and downloading problems," says Kirkwood. "They can talk to others that are using that same type of software package. There's so many packages out there, there's no way we could keep knowledgeable about them all." She confirms Telenet is producing a not-so-regular subscriber newsletter that updates the list of telephone exchanges available and added services.

In spite of drawbacks and concerns for its future, there's no doubt that PC Pursuit has opened up a world of information to computer hobbyists, in-home workers and serious, at-home data freaks. There will be many more subscribers, too, says Kirkwood.

"You see, we're going to keep expanding PC Pursuit," she promises. That's easily understood, for like Henry Ford and his assembly-line model T, PC Pursuit is responsible for bringing a much sought-after product to the little guy — you and me. And that's a revolution in itself. ■



This oil on canvas painting by Joan Mocine, a legal secretary/word processor, depicts a secretary sitting at a Morrow computer wishing she were outside with the free-floating non-workers. She depicts herself in the painting as the woman "flying" just outside the window. Mocine works for Oakland, California attorney Stephen Bedrick.

Digital Radio Service — Radio Wave of the Future

Did You Say One Million Bits Per Second?!?

By Paul Loudon Christensen

OVER the past year or so, many of you may have heard of a new computer to computer link under consideration by the Federal Communications Commission (FCC). You also may have heard that this newly proposed medium was rejected by the same. Now, in most cases, that would be that. But not this time. A funny thing happened on the way to the trash can. This, you probably don't know about, so here it is: The rest of the story!

Don's Brain Child

For the benefit of those that have heard nothing on this subject, a little background is in order. In October of 1985, Don Stoner of Mercer Island, Washington, petitioned the FCC to reallocate a portion of the radio frequency spectrum for use by personal computer owners. He requested two megahertz (MHz) of the little used six meter Ham Radio Band (52-54 MHz just below TV Channel 2).

Had his proposal been accepted, it would have provided computer users with a no cost, license free means of information exchange. This concept has tremendous appeal, especially at the end of the month when the bills for "on-line" time start rolling in.

Don's idea, now commonly referred to as the Public Digital Radio Service (PDRS), is unique in many respects. To begin with, the idea itself is nothing less than bold. Imagine, computer communications with out Ma Bell? Then there is the *one million bits per second* baud rate and the automatic relay of data by user stations (including yours) until it reaches the addressee. At these speeds, the contents of an entire disk could be transferred in less than five seconds. ***Wow!***

Relaying by stations would eliminate the need for expensive mountaintop repeaters. In order to accommodate this high data rate, the petitioner suggested that the entire two megahertz be used as one wide band channel. Each station, or radio modems as they're often called, would put out only enough power to contact the other users closest to them. That way others just out of range could use the channel at the same time. Couple this with a carrier-sense collision avoidance system and you have a fully automatic, interference free link to the outside world.

At this point some of you may be thinking that this sounds like a local area network (LAN). Well, right you are! Because that is exactly what it is, with two important differences: First it would be wireless, and second it might be more appropriate to call it a *wide* area network. The reason for this is, as long as there are stations within range of one another, between yourself and the person you wish to contact, your data will go through. *Note:* You might turn it into a LAN, for linking home or small business computers, peripherals, etc., by installing smaller antennas. Although we have not covered every aspect of this concept, it is my hope to have given you a taste of what may come.

Why the Feds Said NO

You'll remember that I said the FCC has rejected this proposal. Their primary reason: The frequency space asked for is allocated by the International Telecommunications Union (ITU) for ham radio use only. Dog-gone "hams" have all the fun! But, here is the neat part, they did say no to the choice of spectrum but not to the idea. In fact, they went so far as to praise the suggestion and recommend other frequency space where it might be located. Now we're cooking! The suggested frequency range is also a

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Paul Loudon Christensen is a radio and computer experimenter and innovator, and publisher of the Radio Computing Digest.

ham band (902-928 MHz.). It was just given to them but carries little use or interest on the part of hams. It just may be where the masses finally gain access to the air waves. By the way, the ITU has no say on this frequency range. That's one for us.

In principal, a PDRS at these higher frequencies would work the same as one at the originally proposed lower band. There would be two important variations: Instead of one wide channel, a multiple (possibly 200 of them) channel scheme would be set up. Then with each channel being 50 kilohertz or less in width, a maximum speed of 19.2 kB is all that can be expected. This is mainly due to the problems encountered with digital communications at the higher frequencies. Hopefully the FCC would grant the use of more power to make greater digital hops, thereby offsetting the slower delivery of your data. Another negative of using this band is the greater cost of manufacturing radio gear that will effectively operate in it. None the less, the first rigs to come off the assembly line should run in the $500 range, with the price coming down to about $100 as more people get into it. At this point the most important thing is the submission of a new petition. The complexities presented at this frequency range require a several fold increase in preparing a workable concept. But fear not, for Mr. Stoner is busy preparing a new proposal and expects to submit it by the end of this year.

The Second Attempt

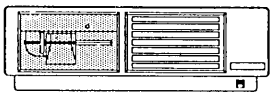
In order for this new petition to succeed, it will require the undying support of computer users. To support it you will need a source of information that will keep you updated on its progress. This writer will endeavor to keep this and other computer related publications PDRS bright. Still, many may wish to have greater and more immediate details on the subject. If you fall into this group, please feel free to contact ether Don Stoner or myself. Better yet, for the cost of copying, postage and handling, I'll send you all the information that I have collected and written on the subject. This package includes the original petition as well as the follow up filings, Don's PDRS update letters (originally sent to all interested parties), plus a copy of my own *Radio Computing Digest* (RCD). RCD is a monthly newsletter "devoted to: Low cost, License-free, Wireless Computer Communications." As an exclusive to the readers of MOR (because you seem like a bright bunch) several excerpts from the premier issue of RCD are herein offered for your enjoyment:

First Word

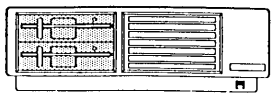
Communications is to this new informational age as transportation was to the retiring Industrial Age. Without

Greg's Tip

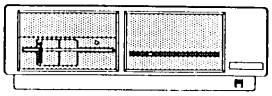
By Greg Smith



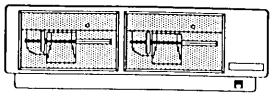
MD1



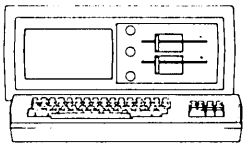
MD3



MDHD



MD2



MD3P

At first glance, this MD might look like the MD1, however, this MD has a hard disk drive which can be easily identified by the small red light in the panel to the right of the floppy drive. This MD has many names, although this group of MDs is often referred to colletively as the MD Hard Disks (MDHD). Their names are derived from the capacity of the hard disk, and include the MD5, MD11, MD16, MD32 and MD64. The capacity of the hard disk, however, is the only difference between these MDs.

These MDs have either one (MD1) or two (MD2) single-sided disk drives. Mechanically, MD1s and MD2s are the same as MD3s except for the number and capacity of the floppy disk drives.

The only substantial difference between the MD3 and MD3P is that the MD3P has the monitor built-in (making it portable, in theory). They both have two double-sided floppy disk drives.

Not All MD3s Are the Same

The MD1s, MD2s, MD3s, and MD3Ps belong to one of two families of the MD product line: either Rev. 1 (has no parallel port) or Rev. 2 (has a parallel port) motherboard. To determine which group your MD belongs to, check what your ROM Rev. is by turning on your computer and noting the second line of text that appears. ROM Revs. 1.0 through 1.6 have Rev. 1 boards, ROM Revs. 2.1 through 3.1 have Rev. 2 boards.

wagons, ships, trucks and planes, the Industrial Revolution could not have become the Machine Age. Without transportation to move the products of an industrialized society, those products would be of little value. In a like manner, what value is information if you can't move it to market? If the telegraph, telephone, radio, television and satellites were never invented, we would not be in the middle of the Informational Revolution. The captains of the Machine Age were those with power over transportation. Who will be the captain(s) of the informational society?

From Telecomputing to Radio Computing

Long distance telephone costs have never been lower. In fact, you can count on them dropping even more, with another battle in the communications war. BUT...how about when the competition dies? Will the new captains(s) still strive to keep costs low? Or will the present 13 cents per minute call to any state jump to $13 for one across town? Telecomputing is great. You can transfer a multitude of data with a small wallet. Nonetheless, your wallet must have a bulge. Wouldn't it be wonderful if those with a smaller bulge could acquire such communicative power? Enter: Radio computing...

The telephone network depends on wires for interconnections. Wires require regular maintenance and periodic replacement. But the carrier of radio waves is essentially maintenance-free and never need replacing. The wireless medium (air or space) is a product of nature, and nature sends no bills. The expense of wireless communications is but a fraction of its wired counterpart. Example: You can install a complete Citizens Band (C.B.) radio station for under $100. With an average of three dollars per month for electricity, maintenance and eventual replacement, you come out with a substantially better buy for your money. Alas, are there no negatives to radio communication? For many reasons, radios will probably never completely replace telephones. Wireless operations can't provide reliable, real-time, long distance connections. Due to seasonal, daily and even hourly variations in radio propagation, spur of the moment voice contacts are limited to a few hundred miles. In other words, for a talk with someone across the country or around the world, Ma Bell is hard to beat. On the other hand, for local contacts, Ma Bell can't compete with Mother Nature.

In actual (real-time) conversations (voice contacts), the wireless operation does have its limits. Fortunately, computer data does not require real-time transfer, nor does it make much use of the human voice. For these reasons, local and national even international data transfer via the wireless medium is possible with what is known as: Packet Radio Communications.

RCD's Purpose

On the cover of my publication a powerful promise is made. It reads as follows: Radio Computing Digest (R.C.D.) is dedicated to low cost, license free, wireless computer communications. Of course, there is more to it than such a simple statement can portray. Just the same, it does, in a nutshell, describe what we are about. RCD's first and foremost interest is in helping you to assemble a radio computing station with the least cash outlay. Second: We show you ways to organize community wide Local Area Networks and Radio BBS's. Finally: RCD assists you in connecting with other LANs in the hopes of an eventual national network. Just how we're going to do this is detailed in the following paragraphs.

RCD is also here to help organize the power of the computerized family behind this concept. Computer users

MORROW
CP/M™ SYSTEMS
CPM IS A REGISTERED TRADEMARK OF DIGITAL RESEARCH INC
*MD2. . . . . $288.00
*MD3. . . . . $388.00
*MD5. . . . . $649.00
*MD11. . . . . $719.00
*MD16. . . . . $789.00
* WITHOUT FRONT DRESS TRIM & NAME PLATE
SAVE EVEN MORE ORDER WITHOUT SOFTWARE AND SAVE 50.00 ON A FLOPPY SYSTEM 75.00 ON A HARD DISK SYSTEM
WE ARE SAVING THE REST OF OUR STOCK FOR REPAIR PARTS
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REPAIR PARTS
QUAD DENSITY DRIVES 79.00
MD1,2 OR 3 MAIN BOARD 45.00
MD5,11,OR 16 MAIN BOARD 199.00
MD2 TO MD3 CONVERSION KIT 129.00
MD1,2,OR 3 PWR SUPPLY 35.00
MD5,11,OR 16 PWR SUPPLY 95.00
MDT70 OR MD3P KEYBOARD 35.00
MD3P COMPLETE BOARD SET 104.00
SEND FOR COMPLETE LIST ..... FREE
Call for a copy of 15 day trial agreement. Tax & freight extra. Send check or add 1.90 for COD. Price may change. Store Price may differ. While supplies last. No POs, terms, or credit cards
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4401 OAKPORT OAKLAND CA, 94601
OPEN 10am-6pm
CLOSED SUN & MON
CALL OUR BBS 415-261-4513
15 DAY MONEY BACK TRIAL
CALL OR WRITE FOR A COPY

have as much right to the air waves as any other group. To insure this right, we must speak out both individually and collectively. RCD will attempt to offer a collective voice. In addition to the above cited principles, RCD will present the latest information in several areas:

— Changes in the proposed Public Digital Radio Service (PDRS).

— Licensed alternatives for radio computing.

— The location of and the rules regarding license free operating frequencies.

— What the FCC is doing in matters concerning your operations, and how to deal with them if the need should ever arise.

— How to get the most out of your on-the-air work, without interfering with others.

— How to set up stations and networks quickly and easily, with the equipment that is currently being manufactured.

— How to convert gear that you already own, for less money.

— Equipment designs that lower costs, increase speed and generally improve your operations.

— The technical side of radio computing.

— Equipment resources (where to get it) for radio modems, wireless transceivers, antennas, etc.

— Consideration for potential future uses.

— Listings of the most recent up-and-running radio LANs and BBSs.

— Updates on publications, services and products offered by PLC's RCD.

— You and your input is RCDs most valuable asset, therefore ample room will be provided for your thoughts and ideas!

There it is, an order made to go. We hope to please your palate. RCD accpets no outside advertising, so only our readers set the bread on RCDs table. If you're ready, dinner will now be served.

License Free Operating

There are other ways of getting on the air without seeking Big Brother's special approval. The FCC, in its great wisdom, has seen fit to grant unlicensed use of certain frequency ranges or bands, as they're often called. RCD will focus its energy on the use of these bands, as well as the promotion of the PDRS idea. Before you can gear up to operate on these bands, you'll need some basic information. You should be forewarned that data transmission on some of these bands does not carry the FCC's approval. Just the same, with the proper considerations, you should be able to use them without hassle. It will depend greatly on the present use of these frequencies in your area.

RCD has identified seven possible bands for your use. Of them, only three are FCC sanctioned for digital transfer, classed as experimental frequencies. Any mode of data (packet, AMTOR, RITTY, ASCII, etc.) and any radio frequency (RF) mode (AM, SSB, FM, CW, etc.) may be used on them. They are the 7, 200 and 1750 meter bands. The seven meter band is located at 49 mH. The "AM" broadcast frequencies make up the 200 meter band. With 1750 meters located at 175 kilohertz (kH.). You may use the AM band, as long as you don't cause any interference to the licensed broadcasters. This should be feasible in most cases.

The other possibilities are the four, five, eight and eleven meter bands. Four meters is your "FM" broadcast band. The 25 radio control channels, at 72 mH, make up five meters. With the 20 cordless telephone channels (10 at 46 mH & 10 at 49 mH) you have the eight meter band. Finally, on eleven meters, you'll find the 40 "CB" channels. Please remember that these last four bands don't carry FCC approval for digital communications. On the other hand, all but one lack restrictive clauses. RCD believes that the only valid criteria for using these bands is that you don't interfere with the present users.

Uses for Radio Computing

Besides doing many of the things that you now use telecomputing for at a continuing cost, there are many possibilities for radio computing with a much lower expense. Local user groups could pass data back and forth, day in and day out, with out tying up a phone line. Your group could pass out electronic copies of its newsletter. The editor would send the issue to one or two close stations, they would pass it to the ones closest to them, and so on, until it has reached all of its readers.

A packet radio BBS would be more efficient and easier to use than its telephone counterpart. Rather than continually redialing to get in, you would send out your packet and go about your business. If your packet was a request for information, the BBS would, in the same manner, packet it back to you. All the while, your computer could be doing other things! You would just check your "mail box" (modem) when ready. Just think of it — more out of your time, money and computer. With one long range station, your community could have a direct link to distant cities. In time we might span the continent. Indeed, your imagination is radio computing's only limit!

For more information contact Don Stoner, the PDRS petitioner at:

6014 East Mercer Way
Mercer Island, Washington 98040
-or-
Paul L. Christensen
Radio Computing Digest
P.O. Box 916
Oroville, Washington 98844

Send nine dollars to RCD for a complete copy of RCD's premier issue and the other documents that were mentioned above. Nearly 100 pages total. ■

MOR Products

Original ***User's Manuals*** published by Morrow.

Prod #	*Description*	*Price*
601	Correct-It User's Manual	8.00
602	CP/M 2.2 User's Guide (for MD2 & MD3)	12.00
603	CP/M Plus Guides (for hard disk MDs; 5 books)	35.00
604	MBASIC User's Guide	12.00
605	MD Companion Guide (for everyone who isn't compatible with CP/M)	12.00
606	MD User's Guide (for MD2 & MD3)	12.00
607	MD Hard Disk User's Guide	12.00
608	Morrow Software Sourcebook (1983 edition)	8.00
609	NewWord User's Guide	12.00
610	Pilot User's Guide	12.00
611	SmartKey User's Guide	8.00
612	SuperCalc User's Guide	12.00

Service Manuals to help repair or enhance your machine. (Even if you don't do the repair yourself, your repairman probably will need them.)

Prod #	*Description*	*Price*
700	Complete manual set (701-710)	80.00
701	Micro Decision Service Guide w/ schematics for Rev. 1.1 & 2.0 (for MD2 & MD3)	25.00
702	Diagnostic II User's Manual (disk sold separately)	25.00
703	Hard Disk MD Service Guide w/ schematics	25.00
704	SA 200 Shugart Mini Floppy Drive Preliminary OEM Manual (for SS drives)	15.00
705	SA 455/465 Shugart Mini Floppy Drive Service Guide w/ schematics (for DS drives)	15.00
706	MDT20 Terminal Reference Guide	10.00
707	MDT20 Service Manual	12.00
708	MDT50 Video Terminal Service Manual	10.00
709	MDT60 Video Terminal Service Manual w/ MT70 Video Terminal Supplement	15.00
710	David Block's original MD Q&A book	6.00

ZCPR3 is a Morrow-bootable CP/M 2.2 replacement by Echelon for the MD3. Complete with two disks and manual, the ZCPR3 kit provides an operating system superior to CP/M 3.0. This kit currently only available for ROM Rev. 3.1. For more information on any of the **Z Supplement** disks (Prod. 803, 806 & 807) send a SASE to MOR, attn: ZCPR3 Dir.

Prod #	*Description*	*Price*
801	ZCPR3–including: Z-System, 85 utilities, help disk and *The Z-System User's Guide.*	59.50
802	Diagnostic II disk	45.00
803	ZCPR3 Utilities source. Five disks with the source code to some of the latest Z-System utilities.	35.00
804	ZCPR3: The Manual	20.00
805	Out-Think–Outline processor	45.00
806	Z-System source code. Four disks with source code to some of the system segments and BIOS.	
807	ZRDOS. Assembled ZRDOS without ZCPR3 plus HLP files.	40.00

ROM Upgrade Kits contain instructions, ROM chips and software—everything you need to bring your machine up to date. (Some software that won't run on older machines *will run* with an upgrade.)

Prod #	*Description*	*Price*
901	ROM Upgrade Kit for MD3	35.00
902	ROM Upgrade Kit for MD Hard Disks	45.00
903	Mike Allen's Clock Kit (MACK) (see ad one page 21 and article in MOR, Vol. 4, #1, p. 35.)	49.00

Floppies of the Bimonth

With every issue of **MOR,** we compile floppies that contain public domain programs, short articles and other interesting tidbits. Each **Floppy of the Bimonth (FLOB)** costs $8.00. Listed here are the **FLOBs** for this issue. A list of all **FLOBs** to date is available upon request.

A Note on Using FLOBs

Some of the files on **FLOBs** have been compacted to allow us to put more on a **FLOB.** When you receive your **FLOB,** you will need to return these compacted files to their original form. The last three letters in a filename (known as the extension), will indicate how the file has been processed. To aid in determining how the varous files have been processed, symbols preceding the filename indicate what you will need to return the files to their original form. A list of the symbols follows:

✓ Indicates that a file has been squeezed. NSweep (on FLOB #2401), UNSQ, and a host of other programs will unsqueeze files for you.

✙ Indicates that a file has been crunched. UNCR (on FLOB #4301) or LT (a library utility on FLOB #4303) will uncrunch files for you.

◊ Indicates that files necessary to this program are in a "LBR" or library file. You will need to extract (and often unsqueeze) the files before using them. NULU (on FLOB #3301), LU, and LT (on FLOB #4303), are a few of the programs that can extract the files for you.

Prod #4401 — August '87 #1

Because some files have been crunched, LT.COM (a utility to uncrunch and extract the files) has been included for your convenience. For complete documentation see FLOB #4303.

◊ ✙ CHEF-5.LBR	Computer recipe database.
◊ ✙ HEBREW.LBR	Language drills for learning Hebrew.

Prod #4402 — August '87 #2

The files on this FLOB that end with ".ARK" are archive files (something like a library file. UNARC.COM and brief instructions are provided on the floppy). For complete instructions on UNARC, see FLOB #4305.

◊ LEISURE2.LBR	Nifty, extensive computer ledger book.
QUOTE.ARK	Random quote-for-the-day generator.
REFIND2.ARK	References Indexer for researchers.
SCHEDULE.ARK	Hour-by-hour daily planner.

Prod #4403 — August '87 #3

Both programs on this FLOB are archive files (something like a library file). UNARC.COM and brief instructions are provided on the floppy. For complete instructions on UNARC, see FLOB #4305.

DIMS103.ARK-	Information Management System; like PCFILE, a simplified but useful database system. Requires extensive MBASIC editing for your terminal.
MINDER.ARK	Date-minder; like SCHEDULE (above) but more complicated.

Prod #4404 — August '87 #4

Some of the files in both of these libraries have been crunched. LT.COM (a utility to uncrunch and extract the files) has been included for your convenience. For complete documentation see FLOB #4303.

◊ ✙ DZ-NOV86.LBR	Dazlestar: a WordStar-like screen-oriented debugger, sophisticated but easy to use.
◊ ✙ Z80DIS22.LBR	Another extensive debugger/disassembler.

Prod #4405 — August '87 #5

◊ 1KUTILS.LBR	Small (1K) memory-resident utilities.
◊ A68K.LBR	Assemble 6800 (MacIntosh) mnemonics on your Morrow.
◊ BUTCH.LBR	Eliza's bar-room uncle.
◊ EPEX11.LBR	Simple CCP replacements; no configuration needed.

Prod #4406 — August '87 #6

This FLOB contains programs for CP/M Plus (Morrow hard disk machines). Because some of the file have been crunched, LT.COM (a utility to uncrunch and extract the files) has been included for your convenience. For complete documentation see FLOB #4303.

◊ ✙ CCP105+.LBR	Latest version of CCP+, includes Unix-like HIST ability.
◊ ✙ DIRDIRS2.LBR	Version of SDir for CP/M+ systems using CCP+.
◊ ROLID10.LBR	RSX utility to log drive in as Read-Only.

Prod #4407 — August '87 #7

Since some of the files on this FLOB have been crunched, UNCR has been provided as a convenience. For complete documentation, see FLOB #4301.

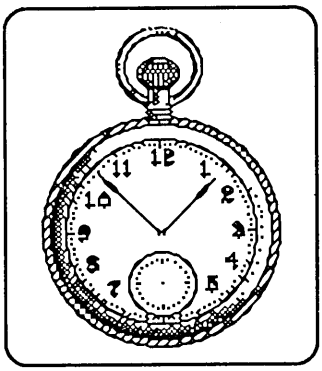
✙ APRBEST.LZT	One CP/M group's pick of the best PD software around as of April '87.
◊ ASMHELP.LBR	An introduction to assmebly-language programming.
✙ CPM/TIPS.DZC	Reprint of early technical info on CP/M 2.2.
✙ DISKLUBE.DZC	Info on lubricating Shugart 8" disk drives.
✙ LEGEND.TZT	The Legend of the Lost Dutchman's Goldmine.
✙ PDFT0487.LZT	Quick list of PD file-transfer systems around the country.
✙ RCPM0587.LZT	Latest list of Remote CP/M Systems around the country.
✙ RS232.HZP	Helpful information on RS232 serial communications lines.

Only **$49**

The MACK

Order Product #903

Put a real clock in your Morrow!! The Mike Allen Clock Kit (MACK) is a ready-to-assemble and install version of the real-time clock described in his recent MOR article (MOR, Vol. 4, #1, p. 35).



Indespensible for a BBS! Great for tracking time for the IRS!

With the complete instructions you can install this clock in your MD2 or MD3 (with Rev. 2 boards only) or on your MD Hard Disk machine (Rev 1.9 ROM only — see MOR Product #902 for update info).

Compatible with the popular program DateStamper (see review on page 39). Also read "The Best of Times" on page 37 by Jim Bottom. He discusses other uses for a real-time clock.

An inexpenisve solution for your clock needs. Keeps you organized and leaves an electronic "trail."

Only $49 (order product #903 from order form on page 26). Shipments begin August 20.

Now's the time to get a MACK!

The Z System

By Echelon, Inc.

You Never Had It So Powerful!

Ready to Run!

Now you can get a complete, ready-to-go replacement for CP/M and your MD3 ... the ZCPR3 kit.

The ZCPR3 kit runs all conventional CP/M programs, and includes:

- **ZCPR3 for Morrow**
- **ZRDOS**
- **Z System User Guide** an 80 page text
- **On-Line Help Disk**

Extended command processing Searches other disks and user areas when typing CP/M commands with PATH function.

ZCPR3 greatly enhances your computing abilities on the Morrow Computer. Here's your chance to improve your computing and work!

- **Library Files** Group together commonly used utility programs into a one single entry file.
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Publisher

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Packet Radio

Radio-Based Computer Communications for the Home Computer

RADIO amateurs in Canada, Sweden and the United States have been experimenting with *packet radio*, a system of computer-based communications. This new mode provides high-speed communication with efficient use of the spectrum, and resists adverse band conditions.

Packet radio can be used not only for informal amateur QSOs (amateur radio contacts) and traffic handling, but it has additional possibilities for data exchange between hams with computers, bulletin board and message systems and remote computer programming.

What is Packet Radio?

Packet radio is a communication system in which information is digitally encoded. In this respect, it is similar to RTTY or ASCII, but with important differences. The differences are key to insuring error-free reception while allowing maximum spectrum use through shared frequency use.

Data integrity is provided by packet radio through a "handshaking" technique and error detection.

Along with each transmission, a computed value called a "frame check sequence" (FCS) is sent, which allows the receiving station to check for errors. The station acknowledges an error-free packet with a special "ACK" signal. If the sending station does not receive a signal within a given time period, it automatically retransmits the packet.

This article originally appeared in the May, 1987 issue of FOGHORN and was written by the Tucson Amateur Packet Radio Group and Clarence G. Welsh.

A packet also contains identification of the destination station, permitting several QSOs to take place on the same frequency. A packet radio station can automatically ignore any packets not addressed to it.

Due to the very short duration of most packet transmissions, the user does not need the channel most of the time. The time between transmissions is available to other users on frequency, a system known as *time-domain multiplexing*.

On a busy channel, the user notices an increased delay time before getting transmission replies, but the packet radio equipment takes care of automatic transmissions and sorting out the replies meant for the station. The user never "hears" the QRM (man-made interference).

What is a Packet Radio Station?

Packet radio requires the use of a microprocessor-based controller at each station, and it will obviously appeal to the ham who already has a computer in his shack. It does not, however, require that the operator be a programmer, or even that the station have a personal computer. All that is necessary is a terminal, a terminal node controller (TNC), and an amateur radio transceiver. The terminal can be a simple display (CRT) or typewriter terminal that produces ASCII characters, a personal computer, or even a commercial mainframe computer.

What is needed is a terminal with a keyboard to allow communication and a screen or printer to display incoming information. Even inexpensive terminals that use TV sets for the display are available.

The way in which most terminals encode ASCII characters is in an "asynchronous" format. Since they are encoded as they are typed, there is a flag consisting of one or more "mark" (binary 1) values to mark the beginning and end of each character. The device decoding the characters expects a specific *baud rate*, or number of transitions from "mark" to "space" (binary 0) per second during the character, but no particular time interval between characters themselves.

The terminal node controller is the heart of the packet radio system. It has one port connected to the terminal or computer, and communicates through it by asynchronous ASCII format at the baud rate required by the terminal. The TNC converts the data stream from the terminal to a packet by attaching a "header" showing the destination of the packet and control information for the network, a tail containing the result of the FCS calculation for error detection, and flags to mark the beginning and end of the packet.

The second TNC port connects it to the transceiver microphone and speaker audio lines, and the PTT line. Ordinarily, the TNC produces AFSK modulation by putting one of two tones into the microphone input, corresponding to a "mark" or "space." In this fashion, the packet is sent out on the air at the packet channel baud rate, which is unrelated to the terminal baud rate at the other port of the TNC.

The receiving TNC reverses this procedure, decoding the audio tones from the speaker audio line of the radio, removing and reading the header and tail information, and passing a successfully received packet to the terminal at the terminal baud rate.

The part of the TNC that does the translation between the sequence of tone levels and the characters is called a "modem," short for MOdulator-DEModulator. A modem may or may

not be built into the TNC board.

Most packet radio modems operate at 1200 baud, which corresponds to about 1200 or more words per minute, although the FCC now authorizes much higher baud rates on some amateur bands.

The audio tones used are 1200 Hz and 2200 Hz. This frequency choice is that of the Bell 202 modem, available as surplus.

The final component of the packet radio station is an amateur radio transceiver. Most packet radio activity so far has been in the two meter band (144-148 MHz). The only important requirement of the radio is that its audio frequency response at 2200 Hz be adequate. In other words, the two meter FM rig you may already have is probably just fine.

What the TNC Does

The TNC consists of a special purpose microcomputer containing all of the necessary software and hardware to communicate with your terminal, assemble a packet, operate your transmitter and receiver to send and receive a packet, and decode a packet.

The special functions of the TNC which would be difficult to implement with an ordinary personal computer are the use of protocol to communicate with other TNCs and real-time control.

The encoding and decoding of packets involves a carefully standardized set of procedures called "protocol." This basically determines the exact form of the header and tail parts of the packet. The header allows receiving TNCs to automatically determine the purpose of the packet, e.g. net check-in, part of a QSO, or ACK to a previous transmission. The tail contains the FCS, which allows the TNC to automatically determine whether the packet was received correctly, and if so, to automiatically acknowledge it.

Since the protocol is programmed into the TNC, the operator does not need to know exactly what his packet "looks" like. In particular, he does not need to know how the destination of his packet is indicated. The operator communicates with other amateurs by call sign, and the TNC translates the call sign into the identification required by the protocol.

The TNC is required to perform a number of tasks simultaneously, including responding to events such as the receipt of a packet or instructions from the operator in real-time (in other words, as they happen).

This makes programming in BASIC undesirable, because it uses an "interpreter" which reads each program line and translates it into machine-type instructions every time the line is executed *(although BASIC compilers are available and in use—Ed.)*

The time required for the translation would prevent a program from responding rapidly enough in a packet radio environment. In order to meet the speed requirement, an assembly language program or equivalent is required. While BASIC looks about the same on any computer, assembly language is different for every machine. If the TNC were replaced by personal computers, program development would have to be redone for each variety of computer.

In addition to maintaining the right pace, the TNC must also constantly "listen" at both ports simultaneously while putting packets together or taking them apart. Personal computer hardware may not even be capable of this sort of multi-task application.

Programming individual TNCs must be as easy as possible, since there will inevitably be unforseen problems in the initial software. Additionally, hardware changes may necessitate software changes. For this reason, TNCs are designed around erasable, programmable read-only memories (EPROMs), which normally function like the ROM of a personal computer where the vital software is stored in an indestructible form. However, if the need arises, they can be reprogrammed by "burning in" the new program using special equipment.

What is a Packet?

A packet is the basic message unit in packet radio. It ordinarily consists of a text message typed in by the operator, sandwiched between the header and tail information required by protocol.

In a typical QSO, a packet would be encoded and sent out by the TNC when the operator ends a line of typing by hitting the ENTER or RETURN key. In any event, the length of a packet is limited, usually to 128 characters. This helps to prevent a single user from "hogging" the channel, as well as making sure that the sending and receiving TNCs don't get swamped with information.

A packet need not consist of ASCII or Baudot character strings, however. It could contain information in other coding systems, such as BCD or EBCDIC or even binary data such as a compiled computer program. The TNC, which uses a "bit oriented protocol" based on a standard called High-level Data Link Control (HDLC), can encode any of these equally easily.

An advantage to this choice of protocol is that the function it requires is available on a single, large-scale integration (LSI) chip, which simplifies the TNC hardware and software.

A second advantage of HDLC protocol is that the beginning and end of the entire message are flagged, making the start and stop bits for each character unnecessary when the packet is transmitted in "synchronous" format.

The "frame" of an HDLC is represented below.

: FLAG : ADDRESS : CONTROL : DATA : FCS : FLAG :

Each packet field is encoded as a sequence of 1's and 0's (bits) to be transmitted as "mark" and "space" tones. With the exception of the DATA field, all fields are generated by the TNC as it assembles the packet for transmis-

sion. The operator is concerned only with the contents of the DATA field.

The FLAG is a unique bit sequence which identifies the beginning of a packet to the HDLC controller. This pattern corresponds to no sequence encountered in any other field, except possibly in the transmission of binary data. Even then, provisions exist for distinguishing data from the flag sequence.

The ADDRESS field contains routing information for the packet. This may include the destination station, the originating station, and possibly intermediate routing data if the packet will be relayed to the destination. The destination and orginating stations might be identified by a network address number or by an amateur call sign, depending upon the exact protocol form used.

The CONTROL field describes the purpose of the packet to the network. It identifies packets with such functions as network check-in or check-out request, packet acknowledgement or requests for information from net control. It may also contain a sequence number for a multi-packet message that must be received in the correct order.

The DATA field contains the message being sent, which ordinarily is the text typed by the user converted in an ASCII data string.

In the case of a packet identified in the control field as performing a control function, the DATA field may be absent.

The FCS allows the receiving station to verify that the packet has been received correctly.

The final FLAG marks the end of the packet.

What is a Packet Network?

A local area packet radio network (LAN) consists of a net control station and a number of individual operators. The net control station is sometimes referred to as the "station node" and the individual stations as "terminal nodes." The net may also contain a digital repeater or "digipeater," which may be the net control station or a separate repeater station.

The repeater station may be a single frequency simplex repeater which retransmits any correctly received packets, or it can be a "normal" split-frequency repeater.

As operators sign onto the net, they are recognized by the net control and given net address codes. An operator desiring to start a QSO with another net station subsequently has his transmissions addressed to that station.

Any operator may choose to have his TNC receive all transmissions, rather than just those addressed to his station. Of course, the TNC only acknowledges those transmissions intended for that station.

The operator whose station is functioning as net control participates in exactly the same way as the other operators. The net control functions are taken care of automatically by his TNC.

As more packet radio LANs become active, there will be the possibility of link stations with access to two distinct LANs. These stations can be members of both nets and serve as communications links through which packets originating in one net can be funneled to an addressee in the other net. The gateway station reformats packets with another layer of protocol-containing inter-network linking information and transmit it to another gateway station in a distant LAN.

Three possibilities are being explored for long-distance links.

1) Ground Relays — TERRACON will be a high-speed, ground-based linking system utilizing UHF and/or microwave relays. It could potentially handle most long-distance packet radio communications in the United States and Canada. It will probably be a few years before TERRA-

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CON is implemented as a useful system, and somewhat longer before the continent is linked.

2) Satellite Service — AMICON will be a satellite-based network utilizing one of the special-services channels on the AMSAT Phase III-B satellite, using a reserved five KHz segment of the mode-B transponder (up on 435 MHz, down on 145 MHz). AMICON allows intercontinental linking and contact with isolated areas not accessible to TERRACON. High data rate experiments are being planned for the 23 cm uplink/70 cm downlink (mode L) translator.

PACSAT is a new satellite class designed solely for digital communications. Current designs call for multiple packet radio uplinks on 435 MHz into a low-earth orbiting (LEO) UoSAT-class OSCAR satellite containing a packet radio repeater (digipeater). A common downlink on 145 MHz would provide either real-time repeating service, or a delayed message storage facility, using up to one megabyte of on-board storage. This "flying packet radio mailbox" could also have more traditional digital channels, like RTTY and ASCII.

There are also possible plans for a packet radio digital repeater aboard the AMSAT Phase III-C satellite.

3) Short-Wave Links — SKIPCON is AMRAD's projected HF network of LAN gateway stations. The nature of HF propogation requires slower data rates (75 to 600 baud) and error correction as well as error detection protocol. A form of error-correcting code for amateur radio known as AMTOR may be the best candidate for handling the vagrancies of HF channels.

SKIPCON experiments have been conducted since the end of 1981.

How to Get in on Packet Radio

There are currently two TNC designs available. The first packet radio TNC was designed by the Vancouver Amateur Digital Communications Group (VADCG). The Vancouver TNC is available as a bare board and requires a power supply, external modem and parts. It comes with instructions and notes on the power supply, and a modem kit is also available from VADCG. The TNC design is based on the Intel 8085 CPU and 8273 HDLC controller, and includes 4K bytes of 2114 RAM and 4K bytes of 2708 EPROM.

The Tucson Amateur Packet Radio group (TAPR) is currently testing a second TNC design. This TNC has the modem, radio interface, serial and parallel terminal interfaces, and power supply circuitry (exclusive of the transformer) on a single board. It is based on the 6809 microprocessor and holds a total of 24K bytes of ROM and 6K bytes of RAM on the board. The 1933 chip it uses is compatible with the 8273 chip used on the VADCG board, and the TAPR TNC will be capable of VADCG-compatible protocol.

In order to make use of packet radio you must be an amateur radio operator. There are five classes of amateur radio licenses, each granting additional privileges.

1) NOVICE — Requires a Morse code test of five WPM, elementary theory and regulation (examination elements 1 & 2). This license grants telegraphy-only privileges in 3700-3750, 7100-7150, 21,200-21200 and 28,100-28,200 KHz; 200 watts POEP output maximum.

2) TECHNICIAN — Requires a Morse code test of five WPM, elementary theory and regulations, general level theory and regulations (examination elements 1, 2 & 3). Grants all amateur privileges above 50.0 MHz plus Novice privileges. This is the license necessary to operate packet radio on the Amateur 2 Meter Band (144-148 MHz).

3) GENERAL — Requires a 13 WPM Morse code test, elementary theory and regulations; general theory and regulations (examination elements, 1B, 2 & 3). Grants all amateur privileges except those reserved for Advanced and Amateur Extra Class.

4) ADVANCED — Requires a 13 WPM Morse code test, general theory and regulations, plus intermediate theory (examinations elements 1B, 2, 3 & 4A). Grants all amateur privileges except those reserved to Amateur Extra Class.

5) AMATEUR EXTRA CLASS — Requires a 20 WPM Morse code test, general theory and regulations, intermediate theory, plus a special examination on advanced techniques (elements 1C, 2, 3, 4A & 4B). Grants all amateur privileges.

Information on becoming an amateur radio operator may be obtained by contacting local radio clubs or by writing to:

The American Radio Relay League
Newington, Connecticut 06111

Florida has a very active packet radio community. The Florida Amateur Digital Communications Association, 812 Childers Loop, Brandon, FL, 33511, has been in the vanguard of activity. Additional information on packet radio in Florida may be obtained by contacting Gwyn Reedy, W1BEL at the above address.

Most of the amateur radio operators involved in packet radio are actively involved with computers. Many run home-built Xerox 820-1 "home brew" units. Others are running Kaypros, Commodores, or whatever else can be used.

Most Florida digipeaters are using BBS systems known as the W0RLI BBS. These are CP/M systems operating with Xerox 820-1s.

This article doesn't provide an overview of packet radio with the hopes that the information gives readers who are not yet hams a desire to become such.

It's a great hobby, and when you match it with computers, it's terrific. ■

CP/M to DOS

Running CP/M in a DOS Environment can be Simple and Inexpensive

By Ralph W. Mathisen

MANY experienced, or even novice, users of CP/M systems often run into a recurring problem: how to communicate with the increasing number of users of DOS-based systems? In many instances, CP/M users even are compelled by necessity, circumstances, or desire to become DOS users themselves. What are they then to do with their several years' worth of CP/M material, both data and software? All too often this material ends up gathering dust on a shelf.

It is possible, of course, to buy one of the Z80 coprocessing boards which fit right into one of the slots in an IBM PC or compatible. This method is certainly the most efficient, as it allows for CP/M programs to continue to run directly with a Z80 processor under the regular Digital Research CP/M operating system. These boards, however, tend to cost several hundred dollars. Many CP/M users have a hard time justifying the expense, especially when their primary interest may be merely to convert their CP/M data to DOS format. The latter concern can be met by any of the data conversion programs on the market, such as CONVERT or XENOCOPY. These programs, however, have the same problem as the CP/M boards: they are expensive. Some of them have another problem as well. Rather than allowing CP/M disk formats to be read, or written, directly on a reassigned DOS drive, they force one to go through a cumbersome process of file-by-file copying via the software interface.

Fortunately, there are now in the public domain two programs, RUNCPM and Z80MU, which can solve both problems (running Z80 based programs and reading CP/M disks) quickly, efficiently, and inexpensively. I have tested both programs on an AT clone running under DOS 3.1.

RUNCPM

RUNCPM is available in the public domain as SIG 561, although some marketers list it under different names and numbers. It is a product of Micro Interfaces Corporation, 6824 N. W. 169th Street, Hialeah, Florida 33015, (305) 823-8088. The public domain version of this program has only very limited documentation, so a little experimenting is necessary to determine exactly how it works, and what its capabilities and limitations are. Potential users might be advised to write directly to the distributor for a complete, documented version.

Ralph W. Mathisen has a B.S. in Astrophysics (Univ. of Wisconsin), an M.S. in Mechanical Engineering (Rensselaer Polytechnic Institute), and a Ph.D. in Ancient History (Univ. of Wis.). He previously worked as a computing analyst with United Aircraft Research Laboratories and at the University of Wisconsin Space Medicine Laboratory. Currently he is an Associate Professor of Ancient History at the University of South Carolina, with research interests in computer applications for the study of Ancient History and the construction of large biographical databases.

Upon running RUNCPM, the user is presented with a menu of three options. Option 2, "Configure CP/M System / Select Terminal Emulation," should be chosen first. The user will now be given a list of eight choices, which encompass a large range of configuration options. The first choice will prompt for 38 possible terminal emulations. The second choice assigns one of two PC types ("IBM PC or Compatible," or "MS-DOS PC"). The third assigns one of seven possible video modes (monochrome, color or graphics). The fifth option is for color monitors only, and assigns any of seven colors to 25 lines. The sixth redirects I-O for the console, list, reader, and punch devices.

The fourth option sets the Logical Drive Assignments. This option is the most difficult one to comprehend. Careful attention to it is needed in order for the disk emulation to work. (See Figure 1).

Figure 1

```
Drive A=E:
Drive B=F:
Drive C=C:
Drive D=D:
Drive E=E:
Drive F=F:
Drive G=A:
Drive H=A:
Drive I=A:
Drive J=A:
Drive K=A:
Drive L=A:
Drive M=A:
Drive N=A:
Drive O=A:
```

In essence, the first letter of each pair of drive specifications represents the drive assignment on the DOS system, the second letter represents the drive assignment on the CP/M system. Furthermore, the CP/M drive needs to be assigned twice, first to the physical DOS drive to which it is to be mapped, and second to the logical drive to which it is to be referred. Here, DOS physical drive A: has been equivalenced to CP/M logical drive E:. But this is not enough. DOS logical drive E: also must be equivalenced to CP/M logical drive E: in order for the system to work. This all may seem a little cumbersome, but this is the way that it works. In a similar way, DOS drive B: has been assigned to CP/M drive F:. In order for the program to operate correctly, the following statements also must be included in the CONFIG.SYS file:

```
DEVICE = ANSI.SYS
DEVICE = READCPM.BIN
FILES = 20
```

Once the configuration has been done, the other two options now can be run. Unfortunately, option #1, "Enter CP/M Mode," does not appear to work at all. CP/M commands which do not appear in DOS, such as SAVE, USER, ERA, and so on do not function, although DOS commands work properly. Similarly, CPM .COM files (which the documentation states should be given the extension .CPM) just lock up the system, although DOS ,COM and .EXE files run just fine. The command "QUIT" can be used to leave the system.

Option #3, however, "Select CP/M Disk emulation," functions extremely well. The user may choose from two lists containing a total of 33 allowed CP/M disk emulations. Once an emulation has been chosen, the user is then asked to "What is CP/M Drive's Logical Assignment." Here, it is necessary to give the letter assigned in the Configuration File, e.g. "E:" for the A: drive, or "F:" for the B: drive. Curiously, the assignment of one drive in this way also will assign any other drives listed in the Configuration File as well. Note, too, that only one drive emulation will work at a time (the most recent one). So if virtual drive E: has been assigned as a Morrow drive, drive F: (if it was assigned in the Configuration File) also will function as a Morrow drive. To change to another CP/M format, one must re-run RUNCPM with option #3.

If the user now exits to DOS after completing this CP/M disk emulation selection, the E: and F: drives will function as CP/M drives, whereas the A: and B: drives will continue to function as DOS drives. If, for any reason, the user now chooses to run RUNCPM in "CP/M Mode" (Option #1), the A: and B: drives will be nonfunctional, regardless of whether DOS disks or CP/M disks are placed in them: attempts to read either of these drives will result in the message "Cannot find COMMAND.COM."

This program, therefore, solves the problem of how to transfer data between CP/M and DOS systems. A DOS drive is made to emulate a CP/M drive, and it can both read and write in CP/M mode. I have used it extensively with disks written on a Morrow MD2,

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and I can attest that in this mode it works very effectively. There remains, however, the problem of how to run CP/M programs (.COM files) in a DOS environment. This can be done by using the program Z80MU.

Z80MU

Z80MU is a Z80 emulator which runs under DOS. It was written by Joan Riff for Computerwise Consulting Services, P.O. Box 813, Mclean, Virginia 22101. It was designed to be used as a Z80 development system which could be run in a DOS environment. It provides a software emulation of the Zilog Z80 and CP/M 2.2, and it was placed in the public domain (see, e.g., PC-BLUE 185) with no copyright notice, no request for a financial contribution, and no guarantee. The most recent version is 3.10, dated March 14, 1986. This supposedly is the last public-domain version.

The actual Z80 emulation is done by an 8088 assembly language subroutine, whereas the mock CP/M interface to the user is written in Lattice "C." Z80MU itself takes up about 93K, and another 64K is occupied by the standard CP/M segment. The developers of Z80MU recommend at least another 64K for control tables, and suggest that the user should have at least 256K RAM available. The program also requires DOS 2.0 or higher.

As to accuracy, the documentation states that the emulator emulates the Z80 almost perfectly and that it is 100% accurate, even down to an exact emulation of all six flag bits in the flags Register. Even the half- carry and add/subtract flag bits are emulated. For faster execution, the emulator ignores the two unused bits in the flags register; these, therefore, will not act exactly as they would on a real Z80. This program will effectively run virtually all Z80 code as it stands. It is as good or better than any of the other Z80 emulators on the market, whatever the price.

The developers of Z80MU admit to being less precise in their emulation of CP/M 2.2, because they wished to abandon some of the limitations of CP/M in favor of the benefits of DOS. They also wanted to include more built-in commands, and to keep the TPA (Transient Program Area) as large as possible. Nevertheless, they did create a user interface just like that of CP/M, as are the BIOS and BDOS (except for hardware specific functions, and CP/M disk formats: the BDOS calls have been converted into the DOS equivalents). The available TPA is 65,022 bytes, which is larger even than that of add-on boards.

According to its extremely detailed documentation, Z80MU has the following capabilities:

1. Complete emulation of Z80 object code, including all six active bits within the Z80 Flags Register.
2. Emulation of CP/M 2.2, with the exception of hard ware-specific functions.
3. Advanced commands for debugging Z80 software (eliminating the need for DDT.COM), including:
   a. Illegal Opcode control (treated as FAULTs or NOPs).
   b. BDOS function trace.
   c. Instruction TRACE and NOTRACE, with Z80 PC traceback.
   d. Breakpoints.
   e. Dump CP/M memory in HEX and ASCII.
   f. Patch CP/M memory in HEX, decimal, binary, ASCII characters, or ASCII strings.
   g. Symbolic labels may be defined and used instead of CP/M addresses.
   h. Z80 register and flag display and alter, including alternate regs/flags and IFF1, IFF2, IMF, I, R regs.
   i. CP/M memory move and find.
   j. Intel HEX files can be properly read into CP/M memory, as well as created from CP/M memory.
4. An "emulated VT52 terminal" (serial ASCII terminal) for full-screen CP/M applications.
5. A full disassembler much like Ward Christensen's RESOURCE.
6. Limited SUBMIT file support.
7. Access to all PCDOS programs and commands.
8. CP/M software reads and writes PCDOS files (but not CP/M files), and can be organized with the PCDOS directory structure (instead of using CP/M's "user number" idea).

The prompt reads "Z80 A>," and all the built-in CP/M commands function properly. Transient commands which have been tested include ASM, DDT, DUMP, ED, LOAD, and PIP. New commands include HELP or ?, for online help, and COLDBOOT! to cold-boot the 64K CP/M segment. Soft ware tested by the developers of Z80MU includes Chang Labs' MemoPlan, dBASE II, LU version 3.00, MBASIC, PMATE-80 rev. 3.02, S-BASIC Basic compiler v5.4b, Software Toolworks 'C' compiler, Target PlannerCalc spreadsheet, Telecon 'C' compiler, and WORDSTAR 3.0 & 3.3 with MAILMERGE. Most other programs familiar to Morrow users, such as BAZIC, LOGICALC, PILOT, SETUP, and SYSGEN, seem to work properly. Other software, such as the MDM711 series of modem programs, Nevada FORTRAN, and public-domain PASCAL, also works.

Hardware-specific commands and programs, however, will not run at all, or will run improperly. Programs like STAT, DU-77, and DUMPX, which directly access the disk and expect it to be in CP/M format, will not run. Similarly, SPELSTAR expects to find the CP/M CCP (Command Control Processor) in the CP/M 64K TPA, and it is not there. Programs which look too closely at the CP/M FCB (File Control Block) also may have difficulty. Furthermore, all programs which use full-screen editing also may have problems dependent upon the type of terminal used on the DOS system. Z80MU expects a VT52 type terminal.

There are several other caveats and limitations associated with Z80MU. For one thing, it is helpful to keep

CP/M .COM files separate from DOS .COM files, preferably in different directories. Attempting, accidentally or otherwise, to run a DOS .COM file under Z80MU, or a CP/M .COM file under DOS almost always will result in the system hanging up, and the need for a DOS cold boot. The developers of Z80MU also warn that if the program ever is aborted, it is advisable to reboot the DOS machine immediately. This is because Z80MU alters the DOS BREAK interrupt. When Z80MU exits normally via the EXIT command, the interrupt is reset, but if Z80MU is aborted, the interrupt is left pointing to an meaningless location in memory. Another thing to remember is that Z80MU requires an easily accessible copy of DOS COMMAND.COM, preferably on hard disk or RAM disk. This can be done via the "SET COMSPEC=" command in an AUTOEXEC.BAT file, or the "SHELL" command in a CONFIG.SYS file. Also, because Z80MU accesses the ROM BIOS directly, all DOS functions, such as I/O redirection, become inoperative while it is running. CP/M I/O redirection of course functions normally.

A further drawback of Z80MU, its inability to read CP/M disk formats, however, can be solved. This can be done by running Z80MU in conjunction with RUNCPM. It is necessary first to set up the CP/M disk emulation, as described above, with RUNCPM. Then, when Z80MU is executed, drives A: and B: will be available as DOS drives, and drives E: and F: as CP/M drives. This will give the best of both worlds, and it now becomes possible to read and write CP/M disks directly in the E: and F: drives while Z80MU is executing. Although drive- specific CP/M programs still will not work, CP/M data can otherwise be read and CP/M programs executed directly from CP/M disks.

A final limitation of Z80MU is its speed. Even though it is the fastest available software-based CP/M emulator, it is still rather slow. This is an inevitable result of the great amount of processing needed to convert the Z80 codes to DOS compatible Intel code. The effective speed can be estimated by using the Z80MU commands SPEED? and HOWFAST? On an 8 MHz. IBM AT clone, the best Z80MU could do was 0.914 MHz. Z80MU appears to be particularly slow in I/O intensive procedures, even when a hard disk or a virtual RAM disk is used. Therefore, those who have converted to DOS machines who still intend to make extensive use of their CP/M software might be well advised to invest in one of the CP/M boards. But for the occasional use of CP/M software, when speed is not of essence, Z80MU makes it possible to continue to use in a DOS environment CP/M programs which otherwise would be inaccessible. ■

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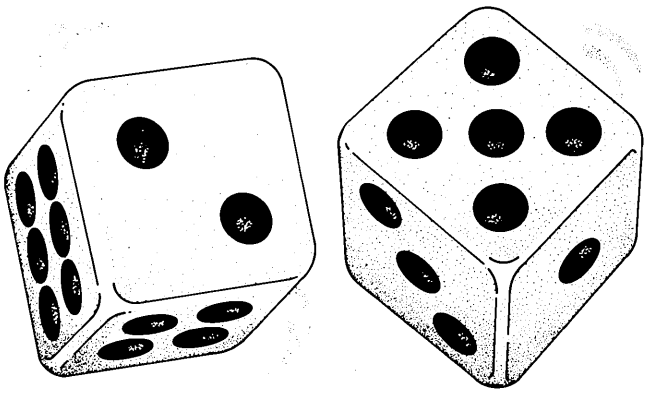

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The Z Primer

ZCPR3 for Beginners

By Richard Marwin

AS a recent purchaser of the MOR bootable ZCPR3 system, I feel compelled to share some of my experiences. Although the system comes with a "Read Me First" document and the "Z-System User's Guide," it impressed me most that I was told all of the wonderful things that ZCPR3 can do (and it can), but nowhere was I told *how* to do them. So let's take things one at a time and perhaps I can save others the pain I suffered getting started.

The "Read Me First" starts out by recommending that you make backup copies of the disks using a complete disk copy program such as Morrow's BACKUP.COM (included on the MASTER disk). Right away, I was in trouble. As always, I first put a read-only tab on the distribution disk to make sure I couldn't hurt it. Then I put a blank disk in drive B, the MASTER disk in drive A and pressed the reset button. I then got a menu to select the terminal. The next sequence is probably unique to me, but I'll tell you what happened.

My MD3 came with the Freedom 100 terminal and I guess I missed the "Free 100" listing on the menu. Knowing it is configured to emulate the ADM 31, I made that selection. I was promptly informed that the disk was write-protected so I had to remove the tab. When I tried it again — *Disaster!* When it returned to the menu, all that was on the screen were the bright selection numbers and everything else that should be half intensity was completely missing. That included all the instructions and prompts. I recalled that selection five was to reset the terminal, so I tried that for just about every terminal on the list but the half-intensity script was permanently missing. I wrote MOR about my problem, and they kindly sent a replacement MASTER disk which worked perfectly.

With the new MASTER disk I repeated the process, first selecting the "Free 100" from the menu and being rewarded with the main menu on the monitor complete with all the half-intensity instructions. Those of you with other monitors will find all of them on one of the three monitor menus which are accessed by pressing the "+" sign.

Then I tried option three from the main menu to make a backup copy. This invokes the Morrow BACKUP.COM program. Following the instructions on the screen, I pressed the carriage return expecting a copy to be made. At this point, the A drive lamp came on, the drive clicked a couple of times, and that was that. Since the B drive lamp did not come on, it was obvious that no copy had been made.

Then I remembered the article in MOR Volume 1, Number 1 on page 34 — "Quieting Down Your Morrow," describing how to increase the step rate of the disk drives so that they run much more quietly. I had long since done that with great success and satisfaction. Evidently the Z-system also comes with the quiet drive arrangement. Another article in the same issue refers to the "Sleepy Drive" syndrome which may be a contributing factor. In any event, I dug out my original CP/M disk with the noisy drive system still on it and used the BACKUP.COM on it. This was accomplished by putting the CP/M disk in drive A, the formatted blank disk in drive B and keying in "BACKUP". Following the instructions on the screen I then replaced the disk in drive A with the Z-System MASTER disk and hit return. This time the disk copy proceeded normally (with noisy drives). now the distribution MASTER disk was retired to my master disk file and I proceeded using the copy (properly write-protected).

Richard O. Marwin is an electrical engineer living in Santa Clara, California. He works for Lockheed Missles and Space Company working with digital command and control systems.

You will notice from the foregoing that placing the distribution MASTER disk in the computer and pressing "reset" results in getting the terminal menu and that invoking it results in a write to the master disk as it creates the terminal parameter program. From my experience this seems risky — I always hate to write *anything* on a distribution disk. A safer procedure would be to start out with your CP/M system disk and use the BACKUP.COM program on it to make a copy disk of the ZCPR3 MASTER disk and then use the copy for making your terminal selection.

Now that the copy MASTER disk is made and write-protected, it is only used from now on to make working disks. One way of doing this is to place it in drive A and a completely blank disk in drive B. From the main menu, select option two to format the disk. I am assuming you have previously selected option one and carefully read the introduction to the Z-System. It's too bad there is no way to make a hard copy of this for reference. Now that the disk is formatted, select option four to create a working disk. You will get a page of instructions for the following menu. That menu has three options: 1, for a complete Z-System using 59K; 2, for a partial Z-System using 61K; and 3, for a partial Z-System using 63K. Why the complete system uses less space than the partials is beyond my comprehension. In any case, I have found no reason to ever use anything but the first option. This uses the Z-System ZEX utility to execute a series of commands. It will SYSGEN the disk in the B drive, which means it puts the Z-System operating system on the outermost tracks of the disk as explained on page 2-1 of the User's Guide, and then it copies several programs to user are A15 of the disk. This is also explained in the User's Guide. At this point it returns you to another page of instructions leading to another menu allowing the selection of the number of utilities to copy to the working disk.

From this menu, selection one copies *all* of the utilities to your disk in drive B, leaving only about 20K free on the disk. Now, why would you want to do this? The answer is simple. This is the disk that allows you to experiment with the Z-System itself and I recommend you make such a disk. There is little else you can do with it except use it as a resource of the utilities you may want later to copy individually or in some combination to other working disks that you use for your everyday work.

Now how about that second disk that came with he Morrow bootable package? That disk contains a vast number of help files, many in libraries and mostly squeezed. What do you do with it? It's easy. Whenever you are using the all-up Z-System disk you just made in drive A, it (or better, its copy) should be in drive B. Then whenever you invoke the help command, the system finds the help file on drive B and displays it to you. You will find it contains a print feature that allows you to practically make your own manual for the Z-System. In fact, you will find help files over and above the information contained in "The Manual."

When I reached this point in my learning, my next question was how in heck do you use the Z-System with everyday programs such as WordStar, LogiCalc, and so on? Good question, and one I asked MOR when I wrote them about my problems with my original distribution disk. Greg Smith kindly provided the answer that is nowhere in the "Read-Me-First" or the "User's Guide," or in the"ZCPR3 — The Manual," for that matter.

The answer is that you put your MASTER disk copy in drive A, your working copy of your system program disk, such as WordStar, in drive B, press the reset button and select option four from the menu. This causes the Z-System to re-SYSGEN your working disk and replace CP/M on the outer tracks with the Z-System. It then places the necessary files into user area A15. Don't be nervous, this in no way destroys any of your programs on the disk which will all be in user area A0. Having done that, from the next menu on the screen you will probably want to select either option two or three to copy some of the utilities onto the disk depending on how much free space was available in the first place. Remember, option two assumes no more than 170K previously used and option three assumes no more than 294K previously used.

If you have followed these steps, you are now on your way to being a Z-System users and the "User's Guide" and "ZCPR3 — The Manual" will have much more meaning for you. You'll also find Rick Charnes' excellent "Forever Z" columns to be more meaningful.

In summary, the rank beginner (such as I have so recently been) should do the following:

1) Write protect distribution disks before doing anything else.

2) Make your backup copies of the distribution disk using your old CP/M system disk.

3) Use the backup copies for all further activity.

4) Put the Master backup in drive A and hit the reset button.

5) Follow the menu to select your terminal.

6) From the Main Menu, format and make a working disk in drive B. From the sub-menu, select item one to make a complete (59K) system and from the next sub-menu copy all utilities by selecting item one. This will be your Z-System familiarization disk.

7) Place any of your current system working disks you want to convert to the Z-System in drive B and from the main menu select item four. Then, from the sub-menu, select either item 2 (170K remaining) or item 3 (294K remaining) to copy some of the utilities. All such disks will operate in the Z-System in the future. ■

The Best of Times

The Value of Using a Real-Time Clock

By Jim Bottom

THERE are no fewer than 18 — count them e-i-g-h-t-e-e-n— clocks of various size and function in my modest, three-bedroom home, not including an assortment of cheap, digital wrist watches. No, I don't have a punctuality fetish. It seems one can hardly buy a product these days without a clock and maybe a calendar stuck on or in it, from micro-wave ovens and coffee makers, to radios, televisions and ball-point pens. I simply have my fair share while marveling at the incalculable marketing wisdom that assumes all of us are consumed with time.

So be it. But given this accumulation of digital and analog apparatus why do I plan to add Mike Allen's computer timepiece (MOR Vol 4, #1, p. 35) to my Morrow MD3?

For starters, I want proof to show the Internal Revenue Service that I really do use the Morrow–and my two other CP/M compatible machines–for business. I'll do that using the Allen MD3 clock and an appropriately modified version of Plu*Perfect Systems DateStamper software. I already use the software to "date-stamp" my files relatively speaking. That is, I use it to keep track of the relative order of files I produce and manipulate. DateStamper can also produce reports for the IRS that document my computer use.

DateStamper, for which with shipping costs I paid $55, is worth its price for this "relative clock" purpose. However, it works best in concert with a hardware timepiece, automatically and precisely dating files and logging hours and minutes spent working on a file for a particular client or business. This hardware and software combination records time, whether or not it is displayed on the computer screen, as an observer would perceive it — in elapsed increments we're accustomed to using: seconds, minutes and hours. Thus we have the term "real-time clock" added to our microcomputer vocabulary.

While CP/M Plus and CP/M 86 operating systems as well as MS-DOS all have time and date-stamping built in, the earlier CP/M 2.2 system used by MD2 and MD3 machines has no such facility. Thus, owners of these, as well as owners of many Kaypro, Osborne, and other popular 8-bit machines, have had to rely on add-on hardware for the benefits real-time clocks provide.

Such benefits include the ability to automatically stamp a date and time on a file each time I revise it. That means by installing the real-time clock I'll know immediately the latest version of any file worked on more than once. There won't be any doubt about which file should be saved and which can be erased.

I might also date-stamp files received by modem from bulletin boards such as MOR. If, for example, I've captured messages from the BBS that I want to save for reference as a single file, that file can be dated so I'll know what to read. Subsequent date-stamping of ASCII files from MOR BBS would give me means to identify saved messages by date. If I ran my own electronic bulletin board, I'd use the clock to automate message maintenance, time-and date-stamping new messages, automatically deleting long-standing "old" messages.

Finally, the day may come when I decide to use my MD3 for a home management or security system, programming it to run heating and air conditioning, lights and various home appliances. A real-time clock with its battery-backed power would be a valuable addition to this 24-hour system for one important reason: It economically satisfies the requirement that a 24-hour system have a means to easily recover from a power failure. I may have to reload the program, but I won't be doing a lot of clock resetting.

Real-time clocks for the Morrow can be found for under $100. The MACK MD3 Real-Time Clock can be built for under $19, and his MDCLCK12.LBR software is available for $8 on FLOB #4109 or free from the MOR BBS.

I can't think of a better hardware investment for my MD3, which already boasts an electronic RAM disk (the SWP, Inc CO-POWER-Plus) and the Mini-Winnie Hard Disk from Advanced Concepts Engineering. An add-on real-time clock is an important enhancement that will give me one more reason to brag about my Morrow--time and time again.

Here's what you can expect from most add-on clocks in your MD2, MD3 or Morrow hard disk machine all performed by an important CMOS (complementary metal-oxide semiconductor) real-time clock/calendar chip.

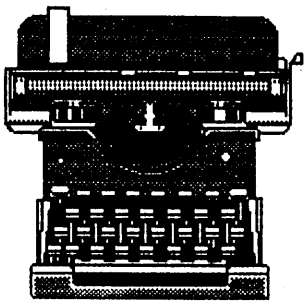
It will:

—keep track of seconds, minutes, and hours in a 24-hour or 12-hour format as well as the day of the week.

—tell the numbered day of the month, the month and the year.

—adjust automatically for leap years, and allow the user to set and correct the time.

—uses its battery to keep the clock "ticking" for long periods, perhaps months or years in spite of the power being turned off. ■



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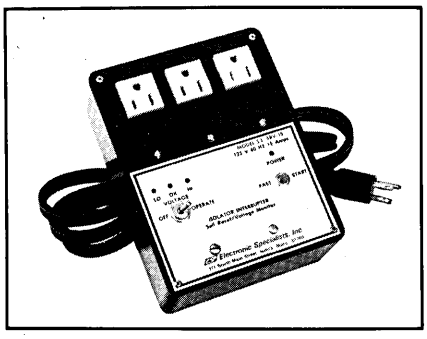
Level III ($99.95) includes file restructure, addition of new fields, interfield communications, running totals, indexing to disk rather than only in RAM, and other file manipulations. Also included is a program to produce a 14 column profit/loss statement from a check register file and an access program called FBACCESS.

Two other partial levels are available for CP/M and other systems. The company is in the process of enhancing the program, as well.

For further information, contact EWDP Software, Inc., P.O. Box 40283, Indianapolis, IN, 46240, or call (317) 872-8799 or CompuServe 73210,3516.

Unattended Computer Protection

Natick, Massachusetts — Electronic Specialists, Inc. has announced the expansion of their "unattended system power interrupter line." Designed to protect unattended computers and other systems from violent power fluctuations or outages, the interrupters disconnect AC power when irregularities occur.



Automatic and manual reset models are now available. In addition, straight blade and twist configurations for 15, 20 and 30 amp circuits are offered. The product costs $210. Contact Electronic Specialists, Inc., P.O. Box 389, 171 S. Main Street, Natick, MA, 01760, or phone (800) 225-4876.

New Upgrade Policy for Smart Checkbook Users

McLean, Virginia — SoftQuest, Inc., publishers of "Smart Checkbook," announced that all users of version 1.4 of the product for the Morrow may now trade their disks and receive Smart Checkbook version 2 at a reduced price. Retailing for $100, the trade-in price is $60 plus $2.50 shipping and the original program disk. Users get the new program disks and a completely rewritten manual. Users may upgrade to any computer format that Smart Checkbook supports, including the IBM PC, single- and double-sided Morrow, and many other CP/M or DOS formats.

Smart Checkbook version 2 incorporates many new features and enhancements suggested by users and is totally compatible with the version 1.4 data files. New features and enhancements include: Up to 85 budget and 85 tax categories for the Morrow (up to 200 for DOS), and the user can change categories at any time; the ability to split an amount among any 15 categories; full budgeting, including a "what if" set up; automatic address and memo printing on checks; combine accounts into a single report or table, even if the accounts are on different disks; switch accounts without leaving the program; single keystroke entries, in most cases; and net worth, backup and disk directory capability.

For more information, contact SoftQuest, Inc., P.O. Box 3456, McLean, VA, 22103, or call (703) 281-1621.

Desktop Publishing Alternative

Pollock Pines, California — The *Resource Manual for Typesetting with Your Computer* offers a simple method for customers to use their own computers and to save keystrokes. The manual guides the reader through step-by-step instructions showing how to transform the inexpensive computer into a professional typesetting terminal.

The manual suggests three methods for finding professional typesetters interested in linking up with computer owners, and includes profiles of several typesetters in various parts of the country. The book also offers many keyboarding tips and codes needed to produce photographically typeset copy.

The *Resource Manual for Typesetting with Your Computer* costs $15 and is available from Arrow Connection, P.O. Box 899, Pollock Pines, CA, 95726, (916) 644-2341. ■

DateStamper

This "Timely" product Helps Organize Your Work

By Rick Charnes

DateStamper; Plu*Perfect Systems, P.O. Box 1494, Idyllwild, CA, 92349; (714) 659-4432; $49; available in general or KayPro versions; Only for CP/M 2.2.

BACK in the winter of 1987 during my regular transcontinental BBS travels I found myself constantly running across messages referring to two programs DateStamper and Backgrounder II, both by Plu*Perfect Systems in southern California, about which people seemed unable to stop raving. The course of discussion on one of my favorite bulletin boards in particular Newton Centre Z-Node in Boston had seemingly been given over entirely to these two programs for a period of several weeks.

I was initially slow to take notice as I am often conservative when it comes to new software purchases. I have since acquired both programs, seen what a total change in my operations they provide, and now utilize them both on a daily basis. I would like in this issue to share some of my experiences with DateStamper, and next time deal with Backgrounder II.

It was actually only thanks to a minor catastrophe I had a few months ago, that DateStamper could have prevented, that I now understand what all the hubbub was all about. These two utilities add a major dimension to CP/M computing that has been sorely missing from our repertoire, and as such deserve our fullest support.

About three months ago I did something fairly outlandish with my system; I decided it was time to reformat my hard disk. The Mini-Winnie's response time was getting much slower than I remember it having been during the couple of months after first attaching it to my MD3. Of course all hard disks will do this eventually as segments of files become scattered over the disk. Methodically I backed up the entire 20 megabytes onto 50 floppies or so, reformatted, copied them back, and experienced no problems except for one minor detail. I maintain an 80k dBase II file of which for good measure I am constantly making several backups on to different floppies each time it is modified. Well, it turns out I had been less than zealous in marking on the floppies which version was the most recent. Result? After the reformatting I had about 6 different versions of the same file staring me in the face, and I simply had no idea which one should assume its dutiful place on my hard disk. It took me about 2 hours of visually comparing the data on each of these, running a "difference" utility on the files and phone calls to non-existent telephone numbers to see which was the most current.

Afterwards I had three or four beers and bought myself a copy of DateStamper.

With DateStamper I would have been able to see the exact creation date of each of these files and simply chosen the most recent. This program places an electronic "stamp" on your files through which various of several utilities can then read the date a file was (a) created, (b) modified, and (c) accessed. The amazing revelation for me was that this can be done WITHOUT a real-time clock.

In addition to the stamping of date *per se*, for those without a clock there is an additional feature called a "relative clock" that marks each file with the value of a counter the program maintains. It is an ordinal stamping, marking the "time" of file access relative to other files. Each time you access, modify, or create a file on your system, from the time you turn on your computer or cold boot, DS marks the file with this simple number count in the form "+nnnn" representing the "time" this file was used relative to other files used during that day. It is a rather ingenious way to deal with the absence of a real time clock.

For instance, if you edit JOE.LTR with NewWord and then create COMMAND.ZEX with VDE.COM, when you look at your directory with the special DateStamper directory program you will see something like Figure 1.

```
>>> Drive C1:   70 files, using 588k (1336k FREE)      +0181 09 Jun'87
 -- file       size       created          accessed          modified --

C1:COMMAND .ZEX   4k | +0156 09 Jun'87
C1:JOE     .LTR   8k | +0087 06 Jun'87  +0153 09 Jun'87  +0154 09 Jun'87
C1:NW      .COM   8k |                  +0152 09 Jun'87
C1:VDE     .COM   4k |                  +0155 09 Jun'87
```

FIG. 1

I have eliminated some unnecessary listings here and changed some values to make it easier to understand, but it should be clear how this "relative clock" counter works in assigning "+nnnn" values. Our first file accessed is NewWord, and that is assigned a value of "+0152", meaning it was the 152nd file access of the day. Next JOE.LTR was accessed (+0153) and ultimately modified (+0154). Then an ac-

Rick Charnes is president of BAMDUA and is a columnist for MOR. He lives in the San Francisco bay area and can be reached on the MOR BBS or at (415) 826-9448 or 821-4345.

cess to VDE (+0155) to create COMMAND.ZEX (+0156). This relative clock counter is a very convenient way to keep track of the order of your operations and hence is of great assistance in generally keeping control of your system and its commands. Z-System users with the command recall shell HSH.COM loaded into memory as well are able to combine the two to retrace with a rather striking accuracy which command accessed which file and in what order relative to other commands.

All the BBS messages and advertising notices I had been reading, however, had given me the erroneous impression that this relative clock was the only "stamping" the program did. It was only after I purchased it that I realized there *is* full **date** stamping even without a real time clock, as shown above. The only thing the user must do to generate these dates is enter it manually at computer power-on or cold boot. I have found this almost no inconvenience at all as I have incorporated it into my Z-System STARTUP alias. CP/M users can simply have AUTO.COM boot it up. After that, the date is "locked" into memory and can even be displayed on-screen independently with a DATE.COM command.

Of course users with a real time clock can simply choose their particular model from the menu provided and will be up and running in no time with full stamping of both date and time.

DateStamper uses approximately 1k of memory for CP/M 2.2 users and 1.25k for the Z-System version. It is not compatible with CP/M 3.0. I am running it on the most memory-hungry Morrow Z-System configuration, with 2k additionally taken up by the Mini-Winnie hard disk driver and Backgrounder II on top of this and I experience no memory problems. I should emphasize that it runs perfectly on a straight CP/M 2.2 system and is not in any way, shape, or form a special Z-System utility. It is furthermore fully compatible with Smartkey. Not only have I experienced no memory problems when running it with our favorite key redefinition program, but there appears to be no requirement that one necessarily be loaded before the other as is the case with many "resident system extensions" of this type.

I was a little disappointed with the instruction manual, at least in regard to its insufficient instructions pertaining to installing it on my particular set-up with Backgrounder II and Z-System running as well. I wrote a letter of complaint and have somehow found myself with the (rather enjoyable) job of writing up a Z-System addendum to the next edition of the DateStamper instruction manual. Users not needing to perform special configurations such as mine did will probably find the 70 page manual quite comprehensive, and I have appreciated the willingness of Plu*Perfect to go out of their way to assist me in this regard.

DateStamper comes with several configuration programs, both for its own internal operations and for one's terminal. They are quite straightforward and easy to follow, except for Z-System users who must get used to following the options for a category rather ignominiously dubbed "Unknown BDOS"! Giving such a name to an operating system so many of us have come to know and love is disconcerting to say the least. (I have since come to understand that the manual and the bulk of the program were written before the authors of DateStamper became Z-System aficionados.) Z-System users will choose the file DATSTMPZ.COM whereas those with CP/M 2.2 will choose DATSTAMP.COM.

One other change I would make in the manual would be to instruct users to configure DateStamper with the program DSCONFIG as the very first step, before installing DateStamper itself. Additionally, when running Backgrounder II and Z-System on top of DS, a necessary preliminary step should be to run SETUPDS, to situate DateStamper precisely at memory location EB80h, 80h bytes above where the Z-System IOP would normally load. I very much would have liked to have had this information when I first got the program; it is non-existent in the manual. Also, since the manual was written before the introduction of Backgrounder II, there is no mention of the special procedures one must follow in this case. Floppy-disk Z-System and CP/M users need make no adjustments, and can install DateStamper in its default location, below the operating system. In either case, once loaded into its proper place I have run it in several different situations with no memory problems or incompatibilities.

After running the configuration options, the program PUTDS creates a file !!!TIME&.DAT on each disk on which you desire date stamping. This read-only file then contains the actual information from which the various utilities read the date. After this step, you are ready to go.

Since CP/M 2.2 users have not made a program of this type — taken for granted in the MS-DOS world — an important part of their repertoire, software companies and public domain programmers have been somewhat lax in the task of developing applications and utilities that support date stamping. To remedy this situation, Plu*Perfect provides as part of the package a disk of several public domain utilities that have been modified by them and others to support date stamping. Most important in this regard is SDD.COM, a special version of SD.COM, the standard CP/M "Super Directory" program. It is this program that created the directory listing in Figure 1. Once you begin to use it as your everyday directory program, it is most enjoyable and interesting to see a listing of dates along with your files. Supplied as well are modified versions of Irv Hoff's MCAT and XCAT cataloging programs, which become superlative tools as they can now read in the date provided by DateStamper.

Additionally provided on the separate disk is source code in assembly language and BDS-C to use as a guide in mak-

ing modifications to already existing programs to allow them to support DateStamper. One assumes as DS's popularity grows we will see an increasing number of standard utilities and applications modified in this manner.

For months now I have been using special DS-supporting versions of the Z-System utilities VFILER, PPIP (a standard Z-System copy program, similar to MCOPY), and PRINT.COM. Furthermore, returning the favor, there is a special Z-System version of DateStamper's SDD.COM that allows named directories to be referenced from the command line. Patches to MexPlus and dBase II are available as well for CP/M users.

Perhaps most powerful of all the programs provided in the package is DateSweep, DateStamper's superb file management utility. DateSweep begins where NewSweep leaves off. In addition to the usual functions provided by a program of this type, it allows the user to access and group files by their temporal relations. In other words, you can view (or set the read-only bit on, or unsqueeze) only those files modified on or after, say, August 1, 1987. It also has the very valuable "negate selection" feature that sophisticated directory programs such as XDIR have. If you would like, for instance, to set the SYStem attribute on all files that were modified before August 31, 1987 and do NOT have the extension of .DOC, DateSweep can handle that with ease.

The most important application of this ability to group files by temporal relations, however, provides what I believe to be perhaps the most useful application of DateStamper as a whole. It gives CP/M 2.2 users the ability to do true "incremental" file archiving or backing-up, a feature normally possible only with CP/M 3.0 or Z-System. If you are a CP/M 2.2 user who regularly backs up important files, you probably have often wished there were some way to back up in a single command only those files worked on during any given day's session. Backing up one's entire disk seems a waste of time, and doing the files one by one is no better. C/PM 3.0 and Z-System use the archive bit which gets turned off or "reset" when a file is modified. At the end of a day an archiving program can be loaded which runs through the disk and backs up only those files whose archive bit is turned off. Up till now, CP/M 2.2 users have had no way to perform this kind of backing up. With DateSweep, however, this function is replicated by simply tagging only those files modified, for example, during the day's operations, and then using DateSweep to copy only these to the backup disk. This works very nicely and provides a very valuable feature to CP/M 2.2 users.

This capability is taken to its logical and extraordinarily useful conclusion with DateSweep's ability to perform full operations, including exit from the program itself, by taking options and parameters from the command line. Only a very few CP/M programs have this degree of sophistication. NULU is the only other that comes to mind. This means, of course, that it can be run from a SUBMIT, EX, or ZCPR3 alias script or, alternately, straight from the operating system prompt. This is very valuable for automating operations. The most important application here, of course, and one for which this feature of DateSweep is ideally designed, will be to include a DateSweep command line in any backing-up submit file you use as the very last operation of the day's work. The day can then be entered as a parameter on the command line. A file called BACKUP.SUB that, for instance, will send all files modified on any given day over to the C: drive would look like:

```
DATSWEEP $$S`$1``CC:`UNX
```

Then, from the command line, "SUBMIT BACKUP =082887" will back up all files modified on the exact date August 28, 1987.

Though this will most probably look like gibberish until one becomes familiar with DateSweep's commands, it is apparent that this feature is extremely useful and in fact most enjoyable to watch in operation. You will no doubt find yourself dreaming up all sorts of exotic combinations with which to experiment. Although since I use Z-System I can do my backing up using the archive bit method I find myself often using DateSweep to do so because of the pleasure I find in watching the attractive console display exhibited during an automation so automated. Power and performance like this is very rare in the CP/M world.

Although the DateStamper directory program SDD.COM does not have an option to display only files from a certain date, this function as well can be replicated by DateSweep. For instance,

```
DATSWEEP $S`=082887``X
```

typed from the command line (or again, a batch script) will load DateSweep, display only those files modified on August 28, 1987, and return you to the command line.

An alternative to either batch control or manual input from the command line would of course be to put any of the above commands into a SmartKey definition, with a pause where the user will insert the date. I find this feature of DateSweep extremely useful and an absolute pleasure to work with.

DateSweep also can be configured for an attractive graphics display on Morrow and other terminals. When running SETTERM.COM, the program that installs all the various DateStamper utilities to one's terminal, when prompted for the characters to be used as a vertical and horizontal bar, rather than entering the usual single characters "|" and "-", respond instead with a multiple character sequence. First the two characters that turn graphics mode on (for most of us, <ESC>,$), then the character that translates into a vertical

or horizontal bar when graphics mode is on (I believe "I" and "J" respectively for the MDT70), and finally "<ESC>,%" to turn graphics mode off. This works to produce a very attractive display for this excellent program.

A program called LOG.COM is also provided with DateStamper which records the total amount of time spent on any of several user-selected task categories such as "business," "personal," "education," etc. This can be very useful for tax purposes.

Here's a "teaser" for those considering purchasing the CP/M task-switching program Backgrounder II as well and are wondering what special features accrue from running both programs simultaneously. At work I use the MS-DOS word processing program WordPerfect and have always thought it slick the way one can touch a function key and watch the program spit out the current date into the document on which I'm working. It's a very handy feature and I had always thought it a shame it couldn't be done in CP/M. Well, now it can. When Backgrounder, which has very extensive key redefinition capabilities, and DateStamper are running simultaneously, the character sequence "\,d" (backslash, "d") will read the date from DateStamper and insert it in your document. This is very nice and very convenient for letters, memos, etc.

Now for the final, and in many ways crucial, question for us Morrow users: when we will have an inexpensive real time clock? Before I realized that DateStamper *does* provide *date* stamping without a clock, my intention was to save my pennies until I could afford the $99 for a Kenmore Z-Time. Now, however, we have two other options. My brilliant and industrious fellow columnist Mike Allen is hard at work producing a Morrow-compatible clock that appears will be available at a much more reasonable price than the Kenmore. I will most probably be one of the first to grab one when Mike finishes his work. (See MACK ad on page 21).

On the other hand, in many ways I am quite satisfied with DateStamper as is and feel no need for the time stamping a clock will provide. My operations are such that accuracy within each day is not that terribly important. Different users will have different needs in this regard. I am only grateful that we now have these options from which to choose.

Support for this product is excellent. Bridger Mitchell, chief technician at Plu*Perfect, has provided me with the most generous and knowledgeable assistance. Though the excellent telephone support will be convenient for some users, Mr. Mitchell has frequently made himself available on the national BBS circuit. I much prefer to save myself money with this method rather than long-distance voice calls, by using PC-Pursuit, the nationwide BBS service ($25 flat fee per month, (800) 835-3638 for information) through which Mr. Mitchell has graciously answered even my most arcane of technical questions on several different bulletin boards. Most users, however, will find the manual perfectly adequate

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for dealing with any problems that might arise.

The price for DateStamper has recently been lowered to $45 and at this price is a bargain. Plu*Perfect Systems is one of the few companies that continues to provide excellent products and continuing support to CP/M users. They were the company that developed the TurboRom that Kaypro users have found so valuable, along with a host of other excellent enhancements. Programmer Bridger Mitchell is one of the Echelon (creators of the Morrow Z-System) team working on a new operating system to take advantage of the new and powerful CP/M-compatible HD64180 and Z280 microprocessors.

DateStamper is a product that gives us a capability we have long needed, and I would urge all Morrow owners to investigate its possibilities.

For Your Information

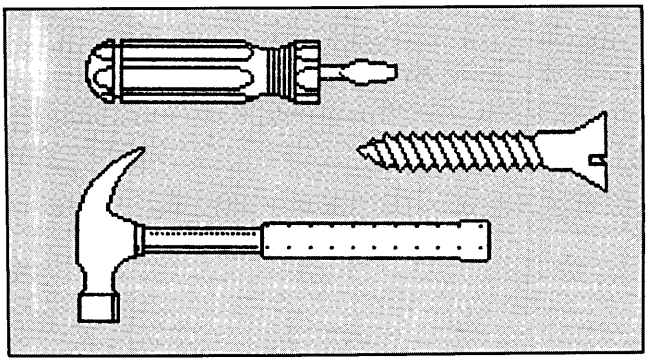
Repair Shops

Since the Repair Shop listing in the last MOR, we have received a few updates on shops that work on Morrow equipment:

Wemco, Inc.
205 E. Frank Phillips Boulevard
Bartlesville, Oklahoma 74003
(918) 336-3890
(MOR Reader Jim Rementer writes that "Wemco has two full-time service technicians, and was an authorized dealer for Morrow Designs.)

Pacific InfoSystems
2855 El Cajon Boulevard
San Diego, California 92104
(619) 284-6800
Contact: Mark Bradbury

Please address any repair updates to Serge Timacheff, Managing Editor, MOR.



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Big Board I,II	✓	✓	✓		
Xerox 820-I,II	✓	✓	✓		
Micro Mint SB-180	✓	✓	✓		
Gemini Zorba	✓	✓	✓		
Osborne	✓	✓	✓		
Sanyo MBC-1150/ 1160/1200	✓	✓	✓		
AVL Eagle (with mods)	✓	✓	✓	(You may delete $90	
Alspa II	✓	✓	✓	for external systems	
Epson QX-10	✓	✓	✓	less P/S enclosure	
Morrow MD-2,3	✓	✓	✓	Add $6.00 for extra	
Z-80 S-100 Computers	✓	✓	✓	long cables)	

The key to the Mini-Winnie system is the INSTALL program, which links your drive and your computer, the way YOU want it. Extensive menu options allow selection of any ST-506 compatible drive, as 1 to 4 logical drives within CP/M at any drive letter. Diagnostic and formal capability provided to match the installation. Distributed in SOURCE form. Compatible with most other add-ons, including SWP CoPower, ZCPR3 and microsphere.

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SOFTWARE, WordStar, Pearl, LogiCalc, MBasic, SmartKey, and manuals. $95. (415) 455-5816.

FOR SALE: Complete word processing system MD2, Dual drive, monitor, much software, Okidata 82-A printer, and many extras. Write for complete list. $700. Contact Micheal Postek, 7260 Titonka Way, Derwood, MD 20855, (301) 963-5790.

FOR SALE: Morrow Design MD2, dual floppy, 64K, terminal, like new with S/W. $500, B/O. (415) 499-1066.

Anitque XEROX 820-1 w/manuals and software – $299. Aztec-C compiler, CP/M and MS-DOS (unused) – $50 each. C source BASIC-C w/EC editor (unused) – $50. R. Baer, 949 Scott, Palo Alto, CA 94301, (415) 321-9721.

SAVE $$$: If any of you computer buffs have phone bills of more than $120/mo., I can save you $$$ with AT&T service, O-Plus dialing, and call from any phone to any phone in the 50 states. Bob Fife, 187 Spruce St., New Smyrna, FL 32069 – (904) 423 1659.

MD2 Rev 2.2 (good) & **MD2 Rev 1.3** (fair) + Freedom 100 (Liberty term. – excl. cond.) + original software & manuals + NewWord + many SSDD disks + comp. file MOR. (805) 242-2271. $375 complete or offer.

Morrow MD11 with MDT60 terminal. Perfect condition. Owner's manual, CP/M 3.0 original software plus RM Cobol, Smart Checkbook, Real World Payroll, Print Master, and Meal Planner. Best offer. Phone (215) 431-1798.

Important Announcements

HARD DISK REPLACEMENT AND THE MD216

Many of the old hard-disks now used in our MD-HDs will soon wear out and are not available anymore. They can be replaced with the new half-height disks now on the market, but they need changes in many of the CP/M 3.0 system files. Your FLOB hunter/gatherer and BAMDUA BBS Sysop Steven Wartofsky has been spending some of his time at MOR on developing this information, which will soon be available. It includes ways to convert any MD-HD (5,11,16,34) into any MD-HD while using the new half-height disks. Steve has also been developing a new machine, the MD216. Really? Well, not quite. Actually it is an MD11 where two 16 Mb hard disks replace the single 11 Mb disk. MOR and BAMDUA will initially build three MD216's, one for each BBS (MOR and BAMDUA) and a third one as a general purpose machine. Progress reports on this project will be on the MOR BBS.

HEAR YE QUEST USERS

If you use QUEST and want to enter a new company name you'll need also to enter a special serial number to make QUEST perform past the demo stage. To get that number from now on: Mail $30 to JAMES RIVER GROUP (see ad, back cover) attention James Hillegass and add your name, address and the new company name exactly the way you'll enter it, minding lower and upper case, spaces, etc. If you buy a new serial number you may request a limited amount of support if you need it.

ORDER A MACK FROM MOR

If you are interested in a kit to assemble a clock for your MD3, or MD-HD (5,11,16,34) you can place your order now with MOR. Price $49. The Mike Allen Clock Kit (MACK) consists of a small PC Board and all the tiny parts you need plus instructions on how to assemble them and connect the clock to your machine (it fits inside). See Important Announcements in MOR June/July '87 for more details and the article "The Best of Times" in this issue on page 37 about using a clock. This clock can be used with DateStamper, which itself is reviewed on page 39 of this issue.

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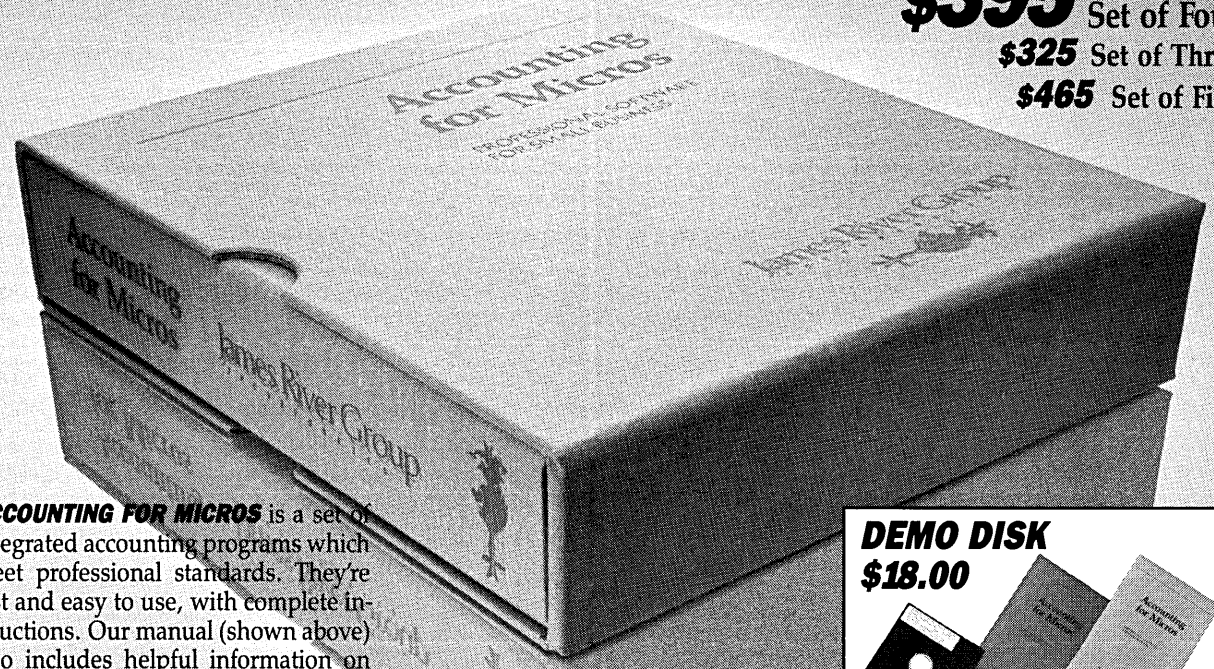

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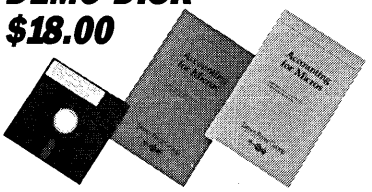

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