Burroughs

System Software Operation Guide Volume 1

B 1000 Systems

(Relative to Mark 13.0 System Software Release)

Distribution Code SC

Priced Item
Printed in U.S.A.
September 1986

5024508

Comments or suggestions regarding this document should be submitted on a Field Communication Form (FCF) with the CLASS specified as 2 (S.W:System Software), and the Type specified as 1 (F.T.R.), and the product specified as the 7-digit form number of the manual (for example, 5024508).

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

LIST OF ILLUSTRATIONS

LIST OF TABLES

INTRODUCTION

Purpose of Manual

The B 1000 Systems System Software Operation Guide is a reference manual for computer operators. Its purpose is to provide all the necessary details to operate the B 1000 system software.

Organization of Manual

This manual consists of seven sections and two appendices. Each is briefly described as follows:

Section	Contents
1	INTRODUCTION TO THE SYSTEM Provides a brief introduction to the B 1000 computer system and lists the related documents.
2	OVERVIEW OF CONTROL INSTRUCTIONS Provides an overview, by function, of the system control instructions.
3	INITIALIZING THE SYSTEM Provides the necessary information to initialize a B 1000 computer system.
4	PROGRAM CONTROL INSTRUCTIONS Provides a description of all the program control instructions available in the B 1000 operating system.
5	SYSTEM COMMANDS Provides a description of all the system commands available in the B 1000 operating system.
6	NETWORK CONTROLLER OPERATIONS Provides a description of the network controller operations.
7	SYSTEM OUTPUT MESSAGES Provides an alphabetical list of all the B 1000 operating system output messages and the operator actions required.
8	SYSTEM HALTS Provides a list of the B 1000 operating system halts and the operator actions required.
A	MCP MEMORY MANAGEMENT Provides a functional description of memory management on the B 1000 computer system.

B SYSTEM PERFORMANCE MONITORING

Provides the operational details of the system performance monitoring capabilities on the B 1000 computer system.

C DISK FILE ACCESS METHODS

Provides a functional description of the disk file access methods available through the B 1000 operating system.

D FILE SECURITY

Provides the operating details of the file security capabilities of the B 1000 operating system.

E NOTATION CONVENTIONS

Describes the notation conventions used in this manual.

Related Documentation

The following documents are referenced in this document:

B 1000 Systems System Software Operation Guide, Volume 2, form 1169091.

B 1000 Systems Network Controller Installation Manual, form 5025257.

B 1000 Systems Network Definition Language (NDL) Language Manual, form 1073715.

B 1000 Systems CANDE Installation and Operation Manual, form 1152006.

B 1000 Systems SMCS Installation, Operation and Functional Description Manual, form 5016488.

B 1000 Systems COBOL74 Language Manual, form 1168622.

B 1000 Systems Report Program Generator II (RPGII) Language Manual, form 1152063.

B 1000 Systems Burroughs Network Architecture (BNA) Installation and Operation Manual, form 1151974.

B 1000 Systems Work Flow Language (WFL) Language Manual, form 5025265.

SECTION 1
INTRODUCTION TO THE B 1000 SYSTEM

Soft Console Screen Displays

The following paragraphs describe the commands available to control the soft console displays on B 1990 systems. The first three letters of each command are its abbreviation.

OPR	The OPR command causes a display of the operator information registers and some system operating instructions.
STK	The STK command causes a display of all 32 locations of the A-stack and TAS register.
REG	The REG command causes a display of the contents of the processors registers, psuedo registers, and scratchpad registers.
CSE	The CSE command causes a display of the contents of the ELOG and a select set of registers that are for systems operation.
RDTEXT	The RDTEXT command causes a display of the contents of the CSE set of registers. Also, up to 255 text characters from memory can be displayed.
NOTEXT	The NOTEXT command clears the 255-character text area of memory and deletes the text display from the screen.
MAC	The MAC command presents a display of the micro-processors input/output ports and key variables used by the firmware.
S16 S24 S39	The S16, S24, and S39 commands cause a display of the S-Memory contents. The memory locations displayed are those locations that were most recently displayed for the particular screen requested. A power up or halt causes a default starting location of zero.
CK	The CK command causes a display of Cache Memory.
H9TEST	The H9TEST command causes a display of the H9 MAINTENANCE PROCESSOR SELF TEST ERROR SUMMARY display. This display is also attempted at power-up time if an error occurs.
HTEST	The HTEST command performs the same function as the H9TEST command on systems with a console diskette.

B 1990 Systems with Console Diskettes

B 1990 systems manufactured after the first quarter of 1985 have been enhanced by replacing the console cassette drive with a console diskette drive. The screen displays have been changed to reflect this enhancement.

The STATUS line now contains the word DISK followed by the default file name to be used by the AUTO, DISK, LOAD, or MTR commands. The default file name is the name of the last utility program that was invoked by the AUTO, DISK, LOAD, or MTR command. This default file name can be up to eight characters in length. The file names of the system utility programs are:

SYSTEM FILE NAME	DISKETTE FILE NAME
CLEAR/START	CLRSTART
PACK/INIT	PACKINIT
COLDSTART/TAPE	COLDTAPE
COLDSTART/DISK	COLDDISK
STANDALONE/DISK-DUMP	SADKDUMP
DISK/DUMP	DISKDUMP

The following soft console commands are available for the B 1990 console diskette systems:

AUTO — The AUTO ["<auto-file-name>"] [ON/OFF] command changes the default file name associated with the AUTO, DISK, LOAD, and MTR commands and the variant status. If the variant is ON or not specified, then after each POWER-ON or HTEST, the MTR "<auto-file-name>" GO commands are executed without operator intervention. If file name is not specified, the current default file-name will be used for the AUTO start.

NOTE

Although the AUTO command with <auto-file-name> changes the default <file-name> used by the DISK, LOAD and MTR commands, the default <file-name> for these commands is also changed anytime one of these commands is issued with a different <file-name>. The default <auto-file-name> is only changed when an AUTO "<auto-file-name>" command is executed.

DIR — The DIR command loads the directory from the console diskette to the Maintenance Access Control (MAC) memory and displays the directory on the console screen.

DISK — The DISK ["<file-name>"] command sets DISK mode and executes a LOAD "<file-name>" command. If the file-name is omitted, the current default file-name is used.

LOAD — The LOAD ["<file-name>"] sets the mode to DISK and loads the specified file. If the file-name is omitted, the current default file-name is used.

MTR — The MTR ["<file-name>"] command CLEARs the system, sets DISK mode and executes a LOAD "<file-name>" command. If the file-name is omitted, the current default file-name is used.

UNLOAD — The UNLOAD command causes the head of the diskette drive to be restored. The file pointer is positioned on the first record. All subsequent commands are delayed until the restore is completed.

Master Control Program (MCP)

The Master Control Program (MCP) is a modular operating system that handles complex and repetitive functions and makes programming and operations efficient and productive. The MCP provides the best coordination and processing control for system throughput by allowing maximum use of all system components. Operator intervention is greatly reduced through complete resource management. Because all program functions are performed under this centralized control, changes in scheduling, system configuration, and program size can be readily accommodated, resulting in greater system throughput.

System Description

The following functions are controlled by the MCP.

- Loading
- Handling interrupts
- Controlling input/output (I/O) up to 150 files per task
- Selecting and initiating programs
- Handling I/O errors
- Maintaining the system log
- Allocating memory and disk storage
- Overlaying data and code segments
- Multiprogramming

The MCP services the following peripheral equipment.

- 96-column card devices
- 80-column card devices
- Data Communications (single-line and multiline controls)
- Disk Cartridges
- Disk Packs
- Diskettes (Floppy Disks)
- Head-per-Track disks
- Line Printers
- Magnetic Tape Cassettes
- Magnetic Tapes (7-track, 9-track, and phase-encoded)
- MICR Reader-Sorters
- Operator Display Terminal (ODT)
- Paper Tape Devices

Device Requirements

The following equipment is required for the B 1000 operating system. This equipment is not dedicated to the operating system and can be used by any user-written program.

Device	Usage
ODT or Console Printer	Operator Communication
Disk	Auxiliary storage

Central Service Module

The Central Service Module (CSM or GISMO) is a microcoded routine that performs the following functions in an equivalent hard-wired machine:

- Handling and detecting interrupts.
- Passing control to or from the MCP, usually on an interrupt.
- Controlling all I/O activity, such as I/O initialization, data transfers, and I/O termination.
- Managing interpreter activity.

Interpreters

Interpreters are microcoded routines, or firmware, that perform the operations specified by the program. Each language has its own interpreter.

Task Schedules and the System Mix

Figure 1-1 shows the overview of the task schedules and the system mix, and the commands that affect the movement of tasks from the waiting schedule, job queues, tasking schedule, and the system mix.

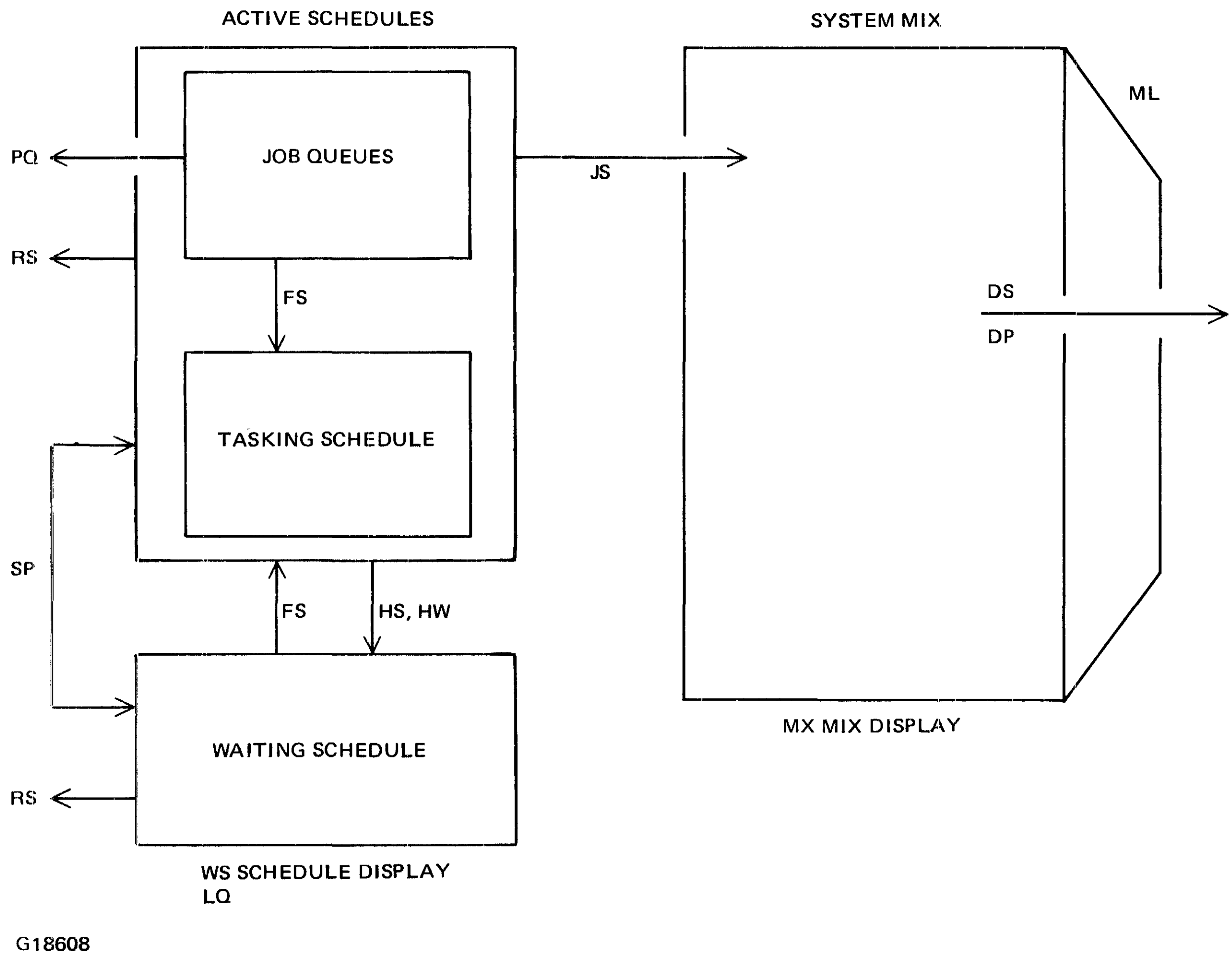


Figure 1-1. Diagram of Task Schedules and System Mix

The basic operation of the B 1000 operating system waiting schedule, active schedules, and mix are described in the following paragraphs.

Waiting Schedule

The waiting schedule contains the tasks that are currently waiting for the completion of another task, for a specific date and time to begin execution, or have been explicitly held in the waiting schedule by the HW or HS system commands. The following commands are allowed for tasks that are in the waiting schedule.

FS System Command

The FS system command causes the task to be removed from the waiting schedule and enter the active schedule.

HW System Command

The HW system command designates that certain tasks are to be placed in the waiting schedule to await the end of job of another specific task or until the system operator enters the FS system command.

RS System Command

The RS system command removes a specified task from the active schedule, job queue, or tasking schedule.

SP System Command

The SP system command changes the schedule priority of a task in the waiting schedule.

WS System Command

The WS system command lists the status of the tasks in the waiting and tasking schedules, and in job queues.

Active Schedules

The active schedules consist of the tasking schedule and job queues; they contain tasks that are candidates to enter the system mix. The tasking schedule is a special variant of the job queues, into which synchronous tasks (such as WFL tasks) and certain MCP-initiated programs that are intended as extensions of the operating system are scheduled. Unlike the job queues, all tasks in the tasking schedule are equal candidates for execution. If insufficient system resources are available to run the first program in the tasking schedule, the MCP merely moves on to the next program. In the job queues, failure to execute the first program in a queue holds up the queue until either the necessary system resources are available or the ordering of jobs within the queue is altered with the appropriate system commands. Throughout this document, the union of the job queues and the tasking schedule are referred to as the "active schedules," except where they must be individually distinguished. A task moves into the system mix when all its required resources are available, and mixlimit restrictions permit. The following system commands are allowed for tasks in the active schedules.

FS System Command

The FS system command causes the specified task to be moved from its job queue to the tasking schedule and thus be made an immediate candidate for execution.

HS System Command

The HS system command causes the specified task to be placed in the waiting schedule.

JS System Command

The JS system command causes the operating system to check the active schedules and to attempt to move the top entries into the mix if memory is available.

RS System Command

The RS system command removes a specified task from the active or waiting schedules.

SP System Command

The SP system command changes the schedule priority of a task in the active or waiting schedules.

WS System Command

The WS system command lists the status of the tasks in the waiting or active schedules.

System Mix

The following system commands affect the status of tasks in the system mix.

DP System Command

The DP system command dumps a task's memory and discontinues the task from the system mix.

DS System Command

The DS system command discontinues a task in the system mix.

ML System Command

The ML system command sets the maximum number of jobs that can be in the system mix below the priority of 9.

MX System Command

The MX system command displays the current tasks in the system mix.

Control Instructions

The MCP is directed to perform particular actions by the system operator through the use of control instructions.

There are two types of control instructions: program control instructions (described in section 4) and system commands (described in section 5).

The following rules apply to all control instructions supplied to the MCP.

- If the percent sign (%) character appears in a control instruction, all information following the percent sign (%) character is ignored for control purposes. This allows comments to be included with the control intructions for documentation purposes. However, if the percent sign (%) character is enclosed within double quotation mark (") characters, the percent sign (%) character is used as part of the control instruction and is not treated as a comment.
- Any program name or file name containing the following special characters must be enclosed within a double quotation mark (") character.

Character Symbol	**Character Name**
;	semicolon
,	comma
=	equal sign
/	virgule
"	double quotation mark
%	percent sign
	blank (forbidden as first character)
<	less than
(	left parenthesis (in other than first position)
+	plus sign
*	asterisk (in other than first position)
'	apostrophe
)	right parenthesis (except as last non-blank character)
:	colon (any character without an explicit terminal key)

Any special characters not contained in this list do not require a double quotation mark (") character to enclose the name.

Example 1:

"FILE%001"

Example 2:

"%3"/"%ABC="

The virgule (/) character in this example separates the first name from the file name and is not enclosed within double quotation mark (") characters.

Example 3:

"/XYZ"

The virgule (/) character is part of the first name and must be enclosed within double quotation mark (") characters.

Example 4:

TESTFILE/#0000000001

The pound sign (#) character is not listed as a special character and does not need to be enclosed within double quotation mark (") characters.

All control instructions are described in the following paragraphs under headings that imply that each instruction must consist of a separate card image. This is not necessary. If the text of one control instruction is delimited by a space or a semicolon character, this is considered the logical end of that control instruction.

Sources of Control Instructions

The following paragraphs describe three sources of control instructions: 1) punched cards, 2) the Operator Display Terminal (ODT), and 3) the ZIP statement.

Punched Cards

If punched cards are used to communicate a control instruction to the MCP, the following rules apply.

Column 1 of the first control card must contain an invalid character for 80-column cards or a question mark (?) character for 96-column cards. An invalid character or question mark (?) character cannot appear in any other column. Columns 2 through 72 of the card can contain control instructions in free-field format. Control information is limited to the first 72 columns of the card.

Operator Display Terminal (ODT)

Control instructions can be communicated to the MCP from the operator display terminal (ODT) by the four steps that follow.

1. Place the unit in LOCAL mode by pressing the LOCAL key.
2. Set the cursor to the HOME (upper, left-hand corner) position. If the control instruction does not fit within the space provided at the top of the screen, the KB INP.LINES system command is used to increase the reserved space as necessary. It is not mandatory, however, to stay within the INP.LINES area.
3. Enter the control instruction. Errors can be corrected directly by using the cursor-positioning keys. On a page mode terminal, terminate the command by pressing the ETX key.
4. Press the XMT key and the control instruction is given to the MCP.

When the MCP has read the control instruction, the ODT is left in receive (RCV) mode to allow displaying of any responses by the MCP. If it is necessary to view the screen for any length of time, place the ODT in LOCAL mode so the MCP is not able to change the screen. The operator must leave the ODT in RCV mode when not entering a control instruction.

It is often necessary to view messages that are no longer displayed on the screen. Scrolling the display backward or forward is possible by using the KB system command.

Transmitting any single-character input message causes the most recent page of ODT output to be refreshed. On a non-B 1990 system, the SPCFY key also causes the screen to be refreshed.

ZIP Statement

Control instructions can be communicated to the MCP by the use of a ZIP statement in an executing program. The ZIP statement in the program must reference a defined data area where the control statement is located. Refer to the appropriate language reference manual for the specific syntax regarding the ZIP statement.

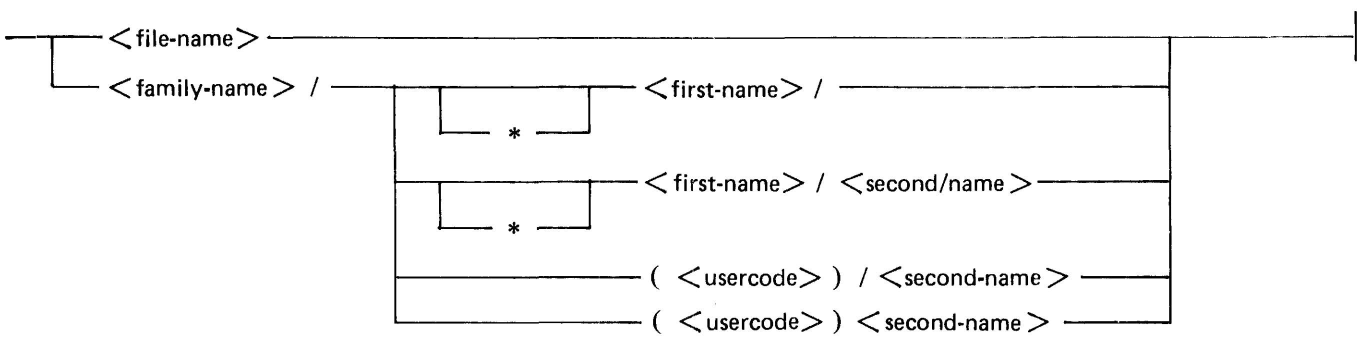
Generic Terms

A number of generic terms are used within this manual to describe the syntax of system commands and output messages. These terms are defined in the following paragraphs.

file-identifier

A file-identifier term identifies and references a file.

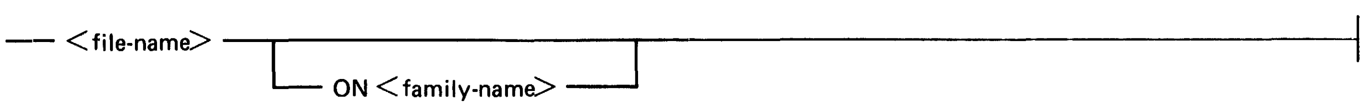
Syntax:



file-title

A file-title term references a file and the name of the disk on which it resides.

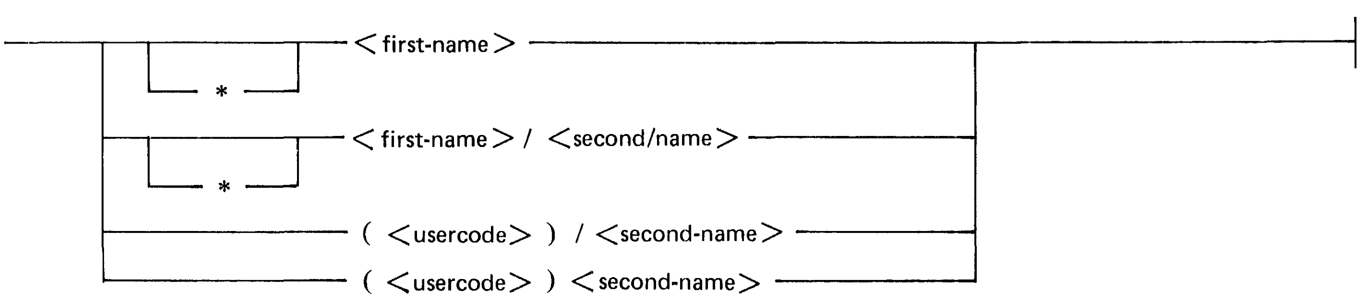
Syntax:



file-name

A file-name term references a file without regard to the media on which it resides.

Syntax:



Semantics:

<family-name>
A <family-name> is the name of a disk or a pack. A <family-name> can also be the name of a tape volume in some Work Flow Language statements. A <family-name> consists of one to ten characters. A <family-name> of DISK refers to the system disk.

*
The asterisk character is used in a file name to specify that the usercode is NOT to be applied to the file name.

<first-name>
A <first-name> is the first part of a <file-name>. A <first-name> consists of one to ten characters. When the asterisk syntax is used, the asterisk character counts as one of the ten characters in the <first-name>.

<second-name>
A <second-name> is the second part of a <file-name>. A <second-name> consists of one to ten characters.

<usercode>
A <usercode> is a name assigned to a user to secure system and file access. When a <usercode> in parentheses is the first part of a <file-name>, the file belongs to the user represented by <usercode>. A <usercode> consists of one to eight characters.

program-name

The program-name term is a file-identifier which is the name of a program.

compiler-name

The compiler-name term is a file-identifier which is the name of a B 1000 compiler.

interpreter-name

The interpreter-name term is a file-identifier which is the name of a B 1000 interpreter.

unit-mnemonic

The unit-mnemonic term is a name that consists of one to three characters and identifies a peripheral device.

The following unit-mnemonic terms are assigned to the peripherals attached to the system by the operating system.

Unit-Mnemonic Name	Device
CDx	Card Reader/Punch
CPx	Card Punch
CRx	Card Reader
CSx	Magnetic Tape Cassette
DCx	Disk Cartridge
DKx	Head-per-Track Disk
DPx	Disk Pack
FDx	Diskette ("Floppy Disk")
LPx	Line Printer
MTx	Magnetic Tape
ODT	Operator Display Terminal
PPx	Paper Tape Punch
PRx	Paper Tape Reader
SRx	MICR Reader-Sorter

The letter x represents any one of the upper-case letters A through Z, or digits 1 through 9, for assignment to multiple units of a specified type. The units begin with the upper-case letter A through the upper-case letter Z, then continue with the digits 1 through 9.

SYSTEM disk

A SYSTEM disk is a disk pack that is initialized as a SYSTEM type pack. Refer to the PACK/INIT or SYSTEM/DISK-INIT utility programs for a complete description of how to initialize a disk pack as a SYSTEM disk. One or more SYSTEM disks must be present on the system for the MCP to function. Head-per-track disk is always considered a SYSTEM disk. The <pack-id> or <family-name> of a SYSTEM disk is always DISK. The name of the actual disk, which is displayed in response to an OL system command may be anything desired.

user disk

A user disk is a disk pack or cartridge initialized as a USER type pack. The MCP does not need user disks present to function. No user disk may be named DISK.

mix number

The mix number is a number assigned to a program by the operating system when it enters the active schedule. This number must be specified when the operator desires to change the state of an executing program or give messages to a program.

SECTION 2
OVERVIEW OF CONTROL INSTRUCTIONS

This section contains an overview of the control instructions available to the operator of the B 1000 system. There are two types of control instructions: program control instructions and system commands. Program control instructions are described in detail and are listed in alphabetical order in Section 4. System commands are described in detail and are listed in alphabetical order in Section 5.

Program control instructions and system commands are grouped into functional categories in this section. A brief description of each instruction is included. This section is intended as a cross reference for an operator who needs to perform a particular function and needs to see a group of control instructions related to that function.

Some control instructions can be used to perform more than one function and, therefore, appear in more than one functional category.

Interrogating and Changing the Time and Date

DR (Date Reset)
Changes the current date maintained by the MCP.

TD (Time and Date)
Displays the current time and date maintained by the MCP.

TR (Time Reset)
Changes the current time maintained by the MCP.

WD (What Date)
Displays the current date maintained by the MCP.

WT (What Time)
Displays the current time maintained by the MCP.

Interrogating the Status of Programs in the Mix

CU (Core Usage)
Displays the amount of system memory in use by one or more executing programs.

DB (Data Bases)
Displays the active DMSII data bases.

MX (Mix)
Displays the priority and status of one or more programs in the mix.

QP (Query Program)
Displays the control attributes of an executing program.

TI (Time Interrogation)
Displays the amount of processor time accumulated for an executing program.

TS (Test Switches)
Displays the switch settings of an executing program.

WM (What MCP)
Displays which MCP and related system software are currently being used.

WY (Why)
Displays the priority and status of one or more programs in the mix.

Responding to Program Messages

AC (Accept)
Precedes a response to an ACCEPT message from a program; cannot be delimited with a semicolon (;) character.

AX (Accept)
Precedes a response to an ACCEPT message from a program; can be delimited with a semicolon (;) character.

FM (Forms Mounted)
Response to a SPECIAL FORMS REQUIRED message from a program.

OF (Optional File)
Response to a NO FILE message from a program when the file has the OPTIONAL file attribute specified.

OK (OK)
Response to a program waiting operator OK.

Status Checking

AB (Auto Backup)
Displays the current autoprint value or reserves a line printer for the autoprint function.

BB (Backup Blocks-per-area)
Displays or sets the number of blocks per area assigned to printer backup files.

BF (Backup Files)
Displays all current printer and punch backup files, and program dumpfiles.

CD (Control Decks)
Lists all pseudo decks on disk.

CT (Correctable Error Table)
Interrogates or changes the size of a table in memory used for logging memory access errors.

CU (Core Usage)
Interrogates the amount of memory in use by any or all programs running.

DB (Data Bases)
Determines which DMSII data bases are in use.

DF (Date of File)
Displays the creation date of a disk file.

DL (Disk Location)
The DL system command designates the system default pack for backup files and dump files.

FN (File Names)
Displays the internal and external file names currently in effect in a program.

HN (Hostname)
Displays the logical hostname of the system.

IC (Interpreter Count)
Displays the current size of the MCP interpreter dictionary.

ML (Mix Limit)
Displays or alters the current MCP setting for the number of jobs with a priority less than nine allowed in the mix.

MM (Memory Management)
Interrogates or alters current parameters used in prioritized memory management.

MP (Memory Priority)
Displays the memory priority of a running program.

MU (Multipack Files)
Displays the multipack file information table.

MX (Mix)
Displays the status of all tasks in the mix.

NET (Network Mode)
Displays the current network mode of the B 1000 BNA system.

OL (Output Label)
Displays the label of the device specified in the request.

PD (Print Directory)
Displays whether or not a file is in the disk directory.

PF (Print Fetch)
The PF system command displays messages from a task that contains a Work Flow Language (WFL) FETCH specification and is awaiting a fetch action.

PP (Processor Priority)
Displays the processor priority of a running program.

PR (Priority)
Displays the processor and memory priorities of a running program.

PV (Pack Override)
Interrogates or alters the pack override status associated with a usercode.

QF (Query File)
Displays the program control attributes of a program on disk.

QP (Query Program)
Displays the program control attributes of a running program.

SD (System Drive)
Denotes additional disk devices as system disks.

SM (Set Data Base Parameters)
Displays the current DMSII data base parameters.

TD (Time and Date)
Displays the current time and date.

TG (Trace Gismo)
Interrogates or alters trace flags used in system dump analysis.

TI (Time Interrogation)
Displays the current processor time used by a running program.

TO (Type Options)
Displays the current setting of the operating system options.

TS (Test Switches)
Displays the current switch settings of a task in mix.

WD (What Date)
Displays the current date.

WM (What MCP)
Displays the name of the executing version of the operating system.

WS (What's in the Schedule)
Displays the contents of the waiting and active schedules.

WT (What Time)
Displays the current time.

WW (What Name Table)
Displays the entries in the Name Table.

WY (Why)
Displays the status of all tasks in the mix.

Messages Concerning Program Status

DP (Dump Program)
Initiates a program memory dump and discontinues the task.

DS (Discontinue)
Terminates a program and closes all files.

IL (Ignore Label)
Ignores a label on an input device when a FILE NOT PRESENT condition is encountered for a program that requires the input device.

MR (Discard Most Recent File)
Discards the most recent file and saves the old file when a DUPLICATE FILE ON DISK condition occurs.

OK (OK)
Continues a program that was suspended by either of the following conditions.

1. The program was suspended by the ST command.
2. The program was suspended waiting for a disk file, more disk space, or more memory and the file, disk space, or memory, respectively, was made available.

OU (Output Unit)
Directs an output file to the device specified.

RM (Remove)
Removes the old copy of the file and replaces it with the new copy when a DUPLICATE FILE ON DISK condition occurs.

UL (Unlabeled)
Assigns an unlabeled tape file or a MICR reader-sorter file to a program from a specified unit. The unit must be ready.

Disk Operation and Interrogate Messages

CH (Change)
Renames files within a disk directory.

DF (Date of File)
Displays the creation date of a file.

FN (File Names)
Displays the internal and external file names of the program.

IL (Ignore Label)
Assigns a different input device for an input file.

KA (Analyze Disk)
Prints disk file information on the line printer.

KC (Print Disk Segments in Character Format)
Prints designated disk segments on the line printer in character format.

KP (Print Disk Segments in Hexadecimal Format)
Prints designated disk segments on the line printer in hexadecimal format.

MH (Modify Header)
Changes the attributes of a disk file.

MU (Multipack Files)
Displays the multipack file information table.

OL (Output Label)
Displays the current label of a device.

PD (Print Directory)
Interrogates whether or not a file is on disk.

PF (Print Fetch)
The PF system command displays messages from a task that contains a Work Flow Language (WFL) FETCH specification and is awaiting a fetch action.

PG (Purge)
Purges the disk directory of a designated disk and makes the disk a scratch disk ready for output.

PO (Power Off)
Makes a phase encoded (PE) tape or disk device go offline. This command should be used prior to removing tape or disk media from a device.

PV (Pack Override)
Displays, sets, or resets the pack override bit for a usercode.

QF (Query File)
Displays the control attributes of a program.

RC (Recover Data Base)
Recovers a DMSII data base when the data base needs recovery.

RE (Remove)
Removes disk files from disk directories.

RL (Relabel)
Changes the label on a user disk.

RT (Remove Multipack Table)
Removes the multipack file information table.

SM (Set Data Base Parameters)
Sets the DMSII parameters of the data base.

SQ (Squash)
Reallocates disk space to reduce checkerboarding.

USER (Usercode)
Associates following text with a specific usercode.

XC (Remove Segments Temporarily)
Temporarily removes disk segments until the next CLEAR/START operation.

XD (Remove Segments Permanently)
Permanently removes disk segments until the disk is reinitialized.

Handling the System Options

DQ (Default Queue)
Displays, assigns, or voids the default job queue.

IC (Interpreter Count)
Sets the number of entries allowed in the interpreter dictionary of the operating system (MCP).

JQ (Job Queues)
Displays parameters of one or all job queues.

KB (Keyboard Options)
Interrogates or modifies the message formatting characteristics of the Operator Display Terminal.

MQ (Make or Modify Queue)
Creates, deletes, or modifies parameters of job queues.

RO (Reset Option)
Resets the designated operating system option.

SL (Set Log)
Invokes the logging functions of the operating system.

SO (Set Option)
Sets the designated operating system option.

TO (Type Options)
Displays the current settings of the operating system options.

Handling Memory Dumps

DM (Dump Memory)
Dumps memory assigned to the designated program and then continues execution.

DP (Dump Program)
Dumps memory assigned to the designated program and then discontinues the program.

PM (Process Memory Dump)
Prints a program memory dump, or packages a system memory dump for later analysis. If used without a designated dumpfile number, the system memory dump is processed.

Handling Magnetic Tape Devices

CL (Clear Unit)
Clears the unit. The user program is discontinued.

FR (Final Reel)
Notifies the operating system (MCP) of the last reel of an unlabeled tape file.

IL (Ignore Label)
Ignores the label on a designated tape drive and accepts the current tape as input.

OL (Output Label)
Displays the label name of a tape on the designated tape unit.

PG (Purge)
Purges the label on a designated tape unit and makes the tape a scratch label ready for output.

PO (Power Off)
Unloads a phase encoded (PE) magnetic tape.

RY (Ready)
Readies a tape that has been locked.

RP (Ready and Purge)
Readies a locked tape and purges it to create an output scratch tape.

SN (Serial Number)
Initializes a tape with the new specified serial number.

UL (Unlabeled)
Accepts an unlabeled tape into the system after a FILE NOT PRESENT condition occurs. Tape unit must be ready.

Handling Peripherals

AL (Align Forms)
Prints one line on the line printer to assist the operator in lining up a special form.

CL (Clear Unit)
Discontinues a program using the designated unit and readies the unit for subsequent use.

CQ (Clear Queue)
Clears messages backed up in the ODT queue.

KB (Keyboard Options)
Controls ODT and may redesignate the line printer for output or recall ODT messages.

LT (Load Train Printer Table)
Loads appropriate train printer translation table under control of the operating system (MCP) if changing train.

OL (Output Label)
Displays the label name on the designated unit if in use by a program or status (ready or not).

OU (Output Unit)
Directs output to the designated unit.

RY (Ready)
Readies a peripheral device for the operating system (MCP).

SV (Save)
Makes a peripheral not ready to the operating system (MCP) until an RY system command is entered to change the peripheral status to READY, or reserves a peripheral for later use by a specific job.

Changing the Status of Programs Running in Mix

DP (Dump Program)
Dump memory and discontinue program execution.

DS (Discontinue)
Discontinues the designated program.

GO (Go)
Resumes a program that has been suspended.

HI (Cause Exceptionevent)
Causes the exceptionevent of a running program .

IV (Invisible)
Interrogates or changes the visibility/invisibility of a task.

LP (Lock Program)
Locks a program in the mix so it cannot be accidentally discontinued by the operator.

LPx (Line Printer)
Sends a message to the copy of SYSTEM/BACKUP that has a specific printer in use.

MCS (Message to MCS)
Sends text to that program currently in the MCS or MCX name table slot.

ML (Mix Limit)
Changes the upper limit to the number of jobs able to run in the mix.

MM (Memory Management)
Controls certain attributes of the memory management system.

MP (Memory Priority)
Changes the memory priority of a running task.

NC (Network Controller)
Sends the associated message to the network controller.

PP (Processor Priority)
Changes the processor priority of a running task.

PR (Priority)
Changes the processor priority of a running task.

SB (Seconds Before Decay)
Sets the number of seconds that a code segment in memory has before the memory priority of the code segment is decremented by 1.

ST (Stop)
Suspends a program in the mix and rolls it out to disk.

SW (Set Switch)
Sets the switches of a program in the mix as designated.

Performing Hexadecimal Conversion and Calculations

CP (Compute)
Computes binary, hexadecimal, and octal conversion as well as basic arithmetic calculations.

Controlling Programs in the Schedule

FS (Force from Schedule)
Forces the designated program from the waiting schedule to a job queue, or from a job queue to the tasking schedule.

HS (Hold Schedule)
Moves a program from an active schedule to the waiting schedule and holds it until an FS system command is entered for the program.

HW (Hold and Wait)
Holds a program in the waiting schedule until a designated program goes to end of job.

JS (Jiggle Schedule)
Causes the MCP to re-check the active schedules for jobs to move into the mix.

LQ (List Queues)
Lists job queue entries and displays current contents of job queues.

PQ (Purge Queue)
Removes all tasks from a specific job queue.

RS (Remove from Schedule)
Removes the designated task number from the schedule.

SP (Schedule Priority)
Changes the schedule priority to a new level. If there is a task hung in a job queue (for example, waiting for an interpreter) and other tasks are waiting for that task to move into the mix, then the SP system command can be used to lower the schedule priority of the hung task so that the other tasks can enter the mix.

WS (What's in the Schedule)
Displays the contents of the active schedule, tasking schedule, and job queues.

Controlling Backup (Spooling) Functions

AB (Automatic Backup)
Designates a line printer to automatically print backup files as they are released.

AL (Align Forms)
Prints one line on the line printer to assist the operator in lining up a special form.

AP (Auto Print)
Inserts a printer backup file into or removes entries from the autoprint queue.

BB (Backup Blocks-per-area)
Displays or sets the number of blocks per area to be used when creating printer backup files.

BF (Backup Files)
Displays the backup files and dumpfiles currently on disk.

BR (Backup Reset)
Changes the current backup file integer to avoid large, unwieldy numbers.

DL (Disk Location)
The DL system command designates or interrogates the system default pack for backup files and dump files.

LPx (Line Printer)
Sends messages to the program that has the line printer LPx in use without the necessity of ascertaining the mix number.

OU (Output Unit)
Assigns a disk or tape device for a backup file in response to a PRINTER OR PUNCH REQUIRED condition.

PB (Print Backup)
Prints or punches designated backup files.

RB (Remove Backup)
Removes designated backup files (same as RF).

RF (Remove Files)
Removes designated backup files (same as RB).

Controlling Pseudo Card Readers

CD (Control Decks)
Displays the current pseudo decks on disk.

ED (Eliminate Deck)
Removes a pseudo deck currently being read by a pseudo reader.

IL (Ignore Label)
"#" designates a numbered pseudo reader.

LD (Load Decks)
Initiates the system load control function.

RD (Remove Decks)
Removes pseudo decks on disk that are not currently in pseudo readers.

RN (Reader Number)
Changes the number of pseudo readers.

Handling the Log Files

EM (ELOG Message)
Enters a message into the engineer's log.

ER (Error Rate)
Displays error rates on selected disk drive units or packs and optionally resets their historic error rate.

ET (ELOG Transfer)
Creates a new log and prints the old log in full or a log summary.

LC (Log Comment)
Enters a message into the system log file.

LN or LG (Log Transfer and Print)
Transfers and prints the system or ODT logs. Old logs can be removed when no longer needed. A new log is created after the transfer operation. Sends the associated message to the network controller.

SL (Set Log)
Initializes the system or ODT log file and sets the number of segments per area. Entering SL 0 resets the log file.

TL (Transfer Log)
Transfers the old system or ODT log file and creates a new system or ODT log without printing the contents of the old log.

Changing the System Software Environment

CM (Change MCP)
Enters new software in the Name Table or purges an entry from the Name Table.

HALT (Halt)
Brings the system to an orderly halt.

SD (System Drive)
Designates the disk units to be used as multipack extensions of the SYSTEM disk.

SE (Switch Enable)
Enables sensing of console switches by software while the system is running.

Burroughs Network Architecture (BNA) Commands

AT (At)
Specifies the hostname of a system in the BNA network to which a message is to be routed.

HN (Hostname)
Displays or sets the logical hostname of the B 1000 system.

NET (Network Mode)
Changes or queries the network mode of the B 1000 BNA system.

NW (Network Message)
Sends the text of a message to the BNA network services manager program.

JOBSTART (Initiate Job Transfer to Another Host)
Requests that the task file on disk be sent to the host in a BNA network and that the task be run there.

Work Flow Language (WFL) Commands

SECURITY
Changes the securitytype and securityuse of disk files.

START (Start a WFL Job)
Executes the WFL job task.

WFL (Work Flow Language)
Specifies that WFL syntax is used in the command that follows.

SECTION 3
INITIALIZING THE SYSTEM

Hardware Initialization

The following paragraphs describe the creation of system cassettes and user disks.

How to Create the System Cassettes

There are six system cassettes used in conjunction with the B 1000 operating system. They are as follows:

Cassette Name	Description
CLEAR/START	Brings system to an operable state.
COLDSTART/DISK	Coldstarts system from a disk pack.
COLDSTART/TAPE	Coldstarts system from a SYSTEM tape.
DISK/DUMP	Dumps a disk pack sector-by-sector.
PACK/INIT	Initializes disks.
STANDALONE/DISK-DUMP	Dumps a disk pack file-by-file.

Creating the CLEAR/START Cassette

To create a CLEAR/START cassette, execute the SSLOAD/MAKCAS program with program switch 2 equal to 0 and enter the file identifier CLEAR/START through the ODT with an AX (accept) system command. One CLEAR/START cassette is created for each AX system command; however, the system operator must ensure that a scratch cassette (SN system command) is made available to the program, and the cassette drive is ready. A blank AX system command terminates the SSLOAD/MAKCAS program.

NOTE
This program uses the magnetic tape cassette I/O control, NOT the console cassette which can only read cassettes.

Example:

Operator Enters:
```
EXECUTE SSLOAD/MAKCAS;SWITCH 2 0;
```

ODT Output:
```
SSLOAD/MAKCAS=1257 BOJ...
% SSLOAD/MAKCAS=1257 ENTER FILE IDENTIFIER
SSLOAD/MAKCAS=1257 ACCEPT.
```

Operator Enters:
```
1257AXCLEAR/START

1257AX
```

ODT Output:
```
SSLOAD/MAKCAS=1257 EOJ.
```

Stand-alone Utility Cassettes (SDL Utility Programs)

To create the stand-alone utility cassettes COLDSTART/DISK, COLDSTART/TAPE, DISK/DUMP, PACK/INIT, and STANDALONE/DISK-DUMP, execute the SSLOAD/MAKCAS program with program switch 0 equal to 1 and identify the input specification file. The input file identifies all software (including the loader, GISMO routine, interpreter, and utility programs) to be loaded onto the cassette. The input file must have the information in the exact format in the following description, one specification per record, each beginning in column 1.

```
L CASSETTE/LOADER
G GISMO/SA
I SDL/INTERP1U
S <file identifier>
```

The CASSETTE/LOADER, GISMO/SA, and SDL/INTERP1U files are the standard system software, and these program names must not be changed. The <file identifier> specifies the name of the SDL utility program to be loaded onto the cassette. All programs to be loaded must exist on disk. Only one SDL utility program can be written to each cassette. The names of each of the SDL utility programs are as follows:

```
PACK/INIT
DISK/DUMP
STANDALONE/DISK-DUMP
COLDSTART/DISK
COLDSTART/TAPE
```

Example:

The following code can be punched on specification cards and used to execute the SSLOAD/MAKCAS program.

```
? EXECUTE SSLOAD/MAKCAS SW 0 1;
? DATA CARDS
L CASSETTE/LOADER
G GISMO/SA
I SDL/INTERP1U
S DISK/DUMP
? END
```

Refer to the SSLOAD/MAKCAS program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the creation of system cassettes.

How to Initialize a Disk Pack

A SYSTEM pack and multiple user disks must be initialized prior to being used on the B 1000 system. There are two system utility programs available for this initialization. They are the SYSTEM/DISK-INIT program and the PACK/INIT cassette. The SYSTEM/DISK-INIT program allows the operator to initialize a disk under the B 1000 operating system. The PACK/INIT cassette allows the system operator to initialize a disk without the B 1000 operating system running. If installing a new B 1000 computer system and a SYSTEM disk is not available, the PACK/INIT cassette must be used. Refer to the PACK/INIT or SYSTEM/DISK-INIT Sections in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the PACK/INIT cassette and SYSTEM/DISK-INIT program, respectively.

How to Initialize the Operating System

The Master Control Program (MCP) is designed as an integral part of the system and serves a wide range of installations and users. Provisions are incorporated in the system to adapt the operation of the MCP to the particular requirements of a variety of installations. This is accomplished by incorporating different environments within the MCP that can be specified at the time of system initialization. Some of the environment options can be changed or set after the system is initialized by using an Operator Display Terminal (ODT).

To place the operating system in control of the system, the operating system must be loaded onto the system disk with the system's environment defined and the disk directory established. The SDL2 interpreter is loaded next to interpret the SMCP S-language. When this procedure is complete, the SDL2 interpreter reads, interprets, and executes the instructions of the SMCP.

The following are the three separate procedures performed during system initialization, thereby making the system operable.

1. The SYSTEM and user disks must be initialized.
2. A coldstart operation must be performed.
3. A CLEAR/START operation must be performed.

How to Coldstart the Operating System

To coldstart the B 1000 operating system requires the following:

- COLDSTART/DISK or COLDSTART/TAPE Cassette
- B 1000 System Software on a disk or SYSTEM tape

The B 1000 operating system can be coldstarted from another disk or SYSTEM tape containing the B 1000 system software.

Using the COLDSTART/TAPE Program

The following instructions are used to coldstart the B 1000 operating system from the SYSTEM tape using the COLDSTART/TAPE program.

1. Mount the SYSTEM tape on a magnetic tape device. Mount the new SYSTEM disk to be coldstarted in the SYSTEM disk drive.
2. If the processor is not already halted (that is, the RUN light on the console is out), bring the system to an orderly halt by entering the HALT system command. If the processor fails to halt (for example, due to an uninterruptible software loop), press the INTRPT or INTERRUPT pushbutton on the system console. If the INTERRUPT pushbutton fails to halt the processor, press the HALT pushbutton on the system console.
3. Place the COLDSTART/TAPE cassette in the console cassette tape drive, and ensure that the cassette rewinds to beginning of tape (BOT). For B 1990 systems with a console diskette drive, load the console diskette that has the COLDTAPE program into the console diskette drive.

4. For B 1990 systems with a console cassette drive, enter MTR GO in the command display and press the [XMT] key.

   For B 1990 systems with a console diskette drive, enter MTR "COLDTAPE" GO in the command display and press the [XMT] key.

   For all other B 1000 systems:

   1) Set the MODE pushbutton to the MTR position.
   2) Press the START pushbutton.
   3) The cassette reads the bootstrap loader and the processor halts with the RUN light out. The L register must contain @AAAAAA@ at this time; if not, the cassette must be rewound and the procedure restarted at step 1.
   4) Set the MODE pushbutton to the NORMAL position.
   5) Press the START pushbutton.

5. Reading of the cassette or diskette continues, loading the COLDSTART/TAPE program into memory. When the entire program has been loaded, control is given to the COLDSTART/TAPE program to begin the coldstart procedure.
6. The coldstart operation is completed successfully when the system console lights display @000011@ in the L register and @AAAAAA@ in the T register. A CLEAR/START operation can then be performed.

If the coldstart operation does not complete successfully, refer to the COLDSTART/TAPE Section in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the action required to complete the coldstart operation.

Using the COLDSTART/DISK Program

The following instructions are used to coldstart the B 1000 operating system from a user disk using the COLDSTART/DISK program.

1. Mount the new SYSTEM disk to be coldstarted in the SYSTEM disk drive.
2. Mount the disk that contains the B 1000 system software.
3. If the processor is not already halted (that is, the RUN light on the console is out), bring the system to an orderly halt by entering the HALT system command. If the processor fails to halt (for example, due to an uninterruptible software loop), press the INTRPT or INTERRUPT pushbutton on the system console. If the INTERRUPT pushbutton fails to halt the processor, press the HALT pushbutton on the system console.
4. Place the COLDSTART/DISK cassette in the console cassette tape drive, and ensure that the cassette rewinds to beginning of tape (BOT). For B 1990 systems with a console diskette drive, load the diskette which has the COLDDISK program into the console diskette drive.
5. For B 1990 systems with a console cassette drive, enter MTR GO in the command display and press the [XMT] key.

   For B 1990 systems with a console diskette drive, enter MTR "COLDDISK" GO in the command display and press the [XMT] key.

   For all other B 1000 systems:

   1) Set the MODE pushbutton to the MTR position.
   2) Press the START pushbutton.
   3) The cassette reads the bootstrap loader, and the processor halts with the RUN light out. The L register must contain @AAAAAA@ at this time; if not, the cassette must be rewound and the procedure restarted at step 1).

4) Set the MODE pushbutton to the NORMAL position.
5) Press the START pushbutton.

6. Reading of the cassette or diskette continues, loading the COLDSTART/DISK program into memory. When the entire program has been loaded, control is given to the COLDSTART/DISK program to begin the coldstart procedure.
7. If the COLDSTART/DISK program is successfully loaded, the following prompt sequence appears on the ODT.

COLDSTART/DISK MARK <mark-level>.<patch-level><date + compile time>

ENTER OUTPUT DRIVE - <DCA, DPA OR DKA>
A valid response causes the next message to be displayed.

ENTER INPUT DRIVE - <DC?, DP? OR DKA>
A valid response causes the next message to be displayed.

IS COMPLETE COPY DESIRED? <YES OR NO>
If YES is entered, all the files on the input disk are copied to the newly-coldstarted system disk. These files are copied after the system software is loaded on the new disk. If NO is entered, only the required system software is loaded on the newly-coldstarted system disk.

IS DATA COMPARISON DESIRED? <YES OR NO>
A YES response causes the COLDSTART/DISK program to verify that all data is copied correctly to the newly-coldstarted system disk. An advisory message is printed for any file in which errors are found.

After the coldstart operation and optional complete copy are complete, the following message is displayed.

COLDSTART COMPLETE - CLEAR/START REQUIRED

The following is an example of this sequence.

ODT Output:
COLDSTART/DISK - 12.0.000(03/12/84 15:10)
ENTER OUTPUT DRIVE - <DPA OR DKA>

Operator Enters:
DKA

ODT Output:
ENTER INPUT DRIVE - <DP? OR DKA>

Operator Enters:
DPB

ODT Output:
IS COMPLETE COPY DESIRED? <YES OR NO>

Operator Enters:
YES

ODT Output:
COLDSTART COMPLETE - CLEAR/START REQUIRED

If the coldstart operation is not successfully completed, refer to the COLDSTART/DISK Section in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the COLDSTART/DISK cassette operation.

How to CLEAR/START the Operating System

The following procedure must be used to perform a CLEAR/START operation:

1. If the processor is not already halted (that is, the RUN light on the console is out), bring the system to an orderly halt by entering the HALT system command. If the processor fails to halt (for example, due to an uninterruptible software loop), press the INTRPT or INTERRUPT pushbutton on the system console. If the INTERRUPT pushbutton fails to halt the processor, press the HALT pushbutton on the system console.
2. Place the CLEAR/START cassette in the console cassette tape drive, and ensure that the cassette rewinds to beginning of tape (BOT). For B 1990 systems with a console diskette drive, load the diskette that has the CLRSTART program into the console diskette drive.
3. For B 1990 systems with a console cassette drive, enter .MTR GO in the command display and press the [XMT] key.

   For B 1990 systems with a console diskette drive, enter MTR "CLRSTART" GO in the command display and press the [XMT] key.

   For all other B 1000 systems:

   1) Press the MODE pushbutton to obtain MTR.
   2) Press the CLEAR pushbutton, then press START.
   3) The cassette reads the bootstrap loader, and the processor halts with the RUN light out. The L register must contain @AAAAAA@ at this time; if not, the cassette must be rewound and the procedure restarted at step 1).
   4) Any temporary environment changes to be made (such as a memory dump request) must be entered in the appropriate registers at this time. Refer to Temporary Operating Environment Changes within this section for details.
   5) Press the MODE pushbutton to obtain NORMAL.
   6) Press the START pushbutton.

4. Reading of the cassette or diskette continues, loading the CLEAR/START program into memory. When the entire program has been loaded, control is given to the CLEAR/START program to begin the system initialization procedure. The cassette is then rewound by pressing the REWIND pushbutton. The rewind is done automatically on B 1900 systems.

If the CLEAR/START operation does not complete successfully, refer to the CLEAR/START Section in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the CLEAR/START operation.

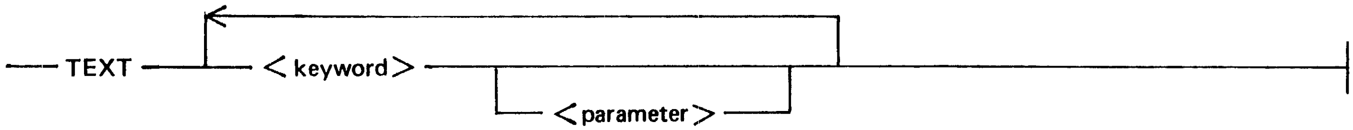
Temporary Operating Environment Changes

Several changes to the default selections made by the CLEAR/START routine can be specified. On B 1990 systems these changes are made before entering MTR GO [XMT] to begin the CLEAR/START process. On other B 1000 systems, the changes are made after the bootstrap loading process halts with @AAAAAA@ in the L register. Please refer to the CLEAR/START Section of the *B 1000 Systems System Software Operation Guide, Volume 2*, for a more detailed explanation of the environment changes parameters.

B 1990 Systems

Temporary environment changes for B 1990 systems are made by using the soft panel command TEXT before the MTR GO [XMT] entry.

Syntax:



<keyword> descriptions follow. <parameter> applies to the keywords DC, DD, IC, NDC, and PM. The values for <parameter> are described in the CLEAR/START Section of the *B 1000 Systems System Software Operation Guide, Volume 2.*

Keyword	Function Requested
AMC	Initiate the MCS program that is in the MCS Name Table entry if the AMCS option is reset. Do not initiate the MCS program if the AMCS option is set.
CX	Select the experimental Controller (CX entry), rather than the standard NDL Controller (C entry).
DC	Override the default selection of the system disk channel.
DD	Change the disk drive unit order.
DM	Memory dump.
DUMP	Same as DM.
GX	Select the experimental GISMO (GX entry), rather than the default GISMO (G entry).
IC	Delete I/O channels artificially.
IH	Enable debug halts in the System Initializer. For use by Burroughs software development personnel only.
IX	Select the experimental SDL2 Interpreter (IX entry), rather than the default SDL2 Interpreter (I entry).
M	Select the MCP. (This is the default.)
MCX	Select the experimental MCS (MCX entry) rather than the standard MCS program (MCS entry).
MMX	Select the experimental Micro MCP (MMX entry), rather than the default Micro MCP (MM entry).
MX	Select the experimental MCPII (MX entry), rather than the default MCP (M entry).
NDC	Inhibits use of the optional disk cache, if present.
NX	Select the experimental System Initializer (NX entry), rather than the standard System Initializer (N entry).
ODX	Select the experimental ODT (ODX entry), rather than the standard SYSTEM/ODT program (ODT entry).
PM	Artificially reduce the system memory size.
TG	Set GISMO trace flags.

The following example requests a memory dump and specifies the experimental MCP (MX entry):

TEXT DUMP MX [XMT]

Other B 1000 Systems

Changes to the default selections made by the CLEAR/START routine can be specified by entering parameters in certain registers after the bootstrap loading process completes during the CLEAR/START process.

Register entries are made by using the REGISTER GROUP and REGISTER SELECT rotary switches to access the desired register, setting the appropriate bits by means of the 24 toggle switches, pressing the LOAD pushbutton, and observing the pattern that appears in the 24 display lights associated with the toggles.

Changes to the system software and firmware that are selected by the CLEAR/START program, as well as a request for a memory dump, are specified by setting certain T register bits. Bit meanings follow (bit 0 is leftmost):

Bit	Function Requested
0	Memory dump. Refer to the *B 1000 Systems System Software Operation Guide, Volume 2*, for additional information.
1	Not used.
2	Not used.
3	Not used.
4	Select the experimental MCP (MX entry), rather than the default MCP (M or MT entry).
5	Select the experimental System Initializer (NX entry), rather than the standard System Initializer (N entry).
6	Select the experimental SDL2 Interpreter (IX entry), rather than the default SDL2 Interpreter (I entry).
7	Select the experimental GISMO (GX entry), rather than the default GISMO (G entry).
8	Select the experimental MICRO-MCP (MMX entry), rather than the standard MICRO-MCP (MM entry).
9	Select the experimental Controller (CX entry), rather than the standard NDL Controller (C entry).
10	Select the experimental MCS (MCX entry), rather than the standard MCS program (MCS entry).
11	Select the experimental SYSTEM/ODT (ODX entry), rather than the standard SYSTEM/ODT program (ODT entry).
12	Enable debug halts in System Initializer.
13 - 15	Not used.
16	Initiates the MCS program that is in the MCS Name Table entry if the AMCS system option is reset. Does not initiate the MCS program if the AMCS system option is set.
17 - 23	Not used.

How to Set the Operating System Options

The following paragraphs describe how to set the operating system options.

Date and Time

After the CLEAR/START operation is complete, the operator must enter the date and time. This is accomplished by entering the DR (date) and TR (time) system commands. This is required only if the TIME and DATE system options are set.

Example:

Operator Enters:
DR 9/22/86;

ODT Output:
DATE = 09/22/86 MONDAY (JULIAN DATE = 86265)

Operator Enters:
TR 1506:30

ODT Output:
TIME = 15:06:30.2

MCP Options

The MCP options enable the operating system to perform certain functions. The system operator can use the SO command to set an MCP option and the RO command to reset an MCP option, except in the case of the LOG and ODTL options, which are independently set with the SL command.

At coldstart time, all of the MCP options, with the exception of BOJ, DATE, DUMP, EOJ, TIME, and WFL are reset and must be set, if desired, as part of the operation of the operating system.

The DATE and TIME options are set automatically at coldstart time. The date and time must be entered after the CLEAR/START operation before the operating system allows programs to be scheduled. If the LOG options is not set, these options can be reset, thereby making it unnecessary to enter the date and time after each CLEAR/START operation. After a CLEAR/START operation, the MCP options remain in the same state, set or reset, as they were before the CLEAR/START operation was performed.

The following is a list of the available MCP options. Each is described in the following paragraphs.

AMCS	BOJ	BREL	CHRG	CLOS	COPY
DATE	DBUG	DMPL	DUMP	EOJ	FLMP
LAB	LIB	LOG	MEM	MPRI	ODTL
OPEN	PBD	PBF	PBT	RMOV	RMSG
SCHM	SQRM	TERM	THR	TIME	TRMD
VLCP	VLIO	WFL	ZIP	OFF	

AMCS

The AMCS option causes the Message Control System (MCS) program specified in the MCS slot of the MCP Name Table to be automatically executed after performing the CLEAR/START operation.

BOJ 1

The BOJ option specifies that a beginning-of-job (BOJ) message be displayed each time the MCP initiates an executable object program.

BREL

The BREL option causes the MCP to display the name of a printer or punch backup file when the backup file is closed and available for printing or punching. If the BREL option is reset, no message is displayed when a backup file is closed.

CHRG 0

The CHRG option requires that all program executions be accompanied with a charge number, which is entered in the log. The only exceptions are in the system programs which are in the MCP Name Table. Once set, and a CLEAR/START operation performed, the CHRG option cannot be reset.

CLOS 0

The CLOS option specifies that the MCP display a file closed message each time an object program closes a file. The message has the following form.

<file-name> CLOSED <close-options>

COPY 1

The COPY option causes information about files being transferred by the SYSTEM/COPY program to be displayed on the ODT. The message has one of the following forms, depending on whether a COPY, COMPARE, or COPY AND COMPARE command was entered.

<file-name> COPIED
<file-name> COMPARED
<file-name> COPIED AND COMPARED

DATE 1

The DATE option is set at coldstart time and specifies that the ** DR PLEASE message be displayed at the end of each CLEAR/START operation. When the ** DR PLEASE message is displayed, the system operator must enter the date with the DR command before program execution can begin. The DATE option cannot be reset if the LOG option is set.

DBUG 1

The DBUG option enables certain additional system commands and MCP functions intended for system software development and debugging. These debugging functions are not required for normal system operation.

DMPL 0

The DMPL (Dumpfile Lock) option protects the dumpfile from being overwritten until it can be analyzed or packaged for later analysis. This option, when set, disables the ability to take a system memory dump other than during a CLEAR/START operation.

DUMP

The DUMP option must be set in order to dump system memory. If the DUMP option is reset, the SYSTEM/DUMPFILE file is removed from the pack designated by the DL system command, and the disk space is made available to the system. Any attempt to dump system memory (not the DM or DP for a program) is ignored by the MCP if the DUMP option is reset. A firmware halt with L = @00F017@ occurs if a CLEAR/START memory dump is attempted with the DUMP option reset.

EOJ

The EOJ option specifies that the end-of-job (EOJ) message be displayed each time an object program reaches normal end of job.

FLMP

The FLMP option causes the SYSTEM/INIT program to retain code in GISMO to enable the fixed lamp display. A CLEAR/START operation must be done to invoke the FLMP option. Refer to appendix B for a complete description of the fixed lamp display.

LAB

The LAB option causes the MCP to display a label name when a Tape Unit or Disk Pack becomes ready. The character set for a Train Printer is also displayed.

LIB

The LIB option causes the MCP to display library maintenance actions performed on disk files. The message displayed on the ODT can be one of the following when a file title has been changed, a file has been copied, a file has been removed, or a file has been updated or replaced.

<file-name> CHANGED TO <file-name>
<file-name> REMOVED
<file-name> REPLACED

LOG

The LOG option causes the MCP to keep a log of all program executions on disk. Refer to descriptions of the LG, SL, and TL commands in this section for actions pertaining to the LOG option. The LOG option cannot be referenced by the RO or SO MCP options. When the LOG option is set, the names of any programs that were aborted by a system halt are displayed on the ODT when a CLEAR/START operation is performed.

When the LOG option is set, the MCP automatically provides information for the Time Analysis and Billing System (TABS) and for several other Burroughs-supplied log-analysis utilities. The following restrictions apply to the LOG option.

- After the LOG option is set, a CLEAR/START operation is required for the setting to take effect. Also, no more jobs are scheduled until a CLEAR/START operation is performed.
- When the LOG option is set, the DATE and TIME options are unconditionally set by the MCP.

MEM 0

The MEM option, when set, causes the MCP to display messages regarding insufficient memory conditions.

MPRI 1

The MPRI option, when set, causes the SYSTEM/INIT program to retain the code in GISMO necessary to implement Level Three (Priority Memory Management) of the memory management system. Refer to appendix A for a complete description of the Level Three memory management system. A CLEAR/START operation is required after setting or resetting the MPRI option for the MPRI option to take effect.

ODTL 1

The ODTL option requests that the SYSTEM/ODT program maintain a log on disk of all system commands and output ODT messages. Refer to the LG, SL, and TL commands in this section for information concerning the ODTLOG file. The ODTL option cannot be referenced by the RO and SO MCP system control instructions.

OPEN 0

The OPEN option causes the MCP to display a message each time an object program opens a file. The open message has the following form.

<file-name> OPENED <open-options>

PBD 1

The PBD option causes output files assigned to a printer or card punch to be diverted to a disk backup file if the required output device is not available when the object program opens the file.

PBF 0

The PBF (Printer Backup First) option causes printer files to go to backup even if a printer is available, unless a given file is specified to be hardware only.

PBT 0

The PBT option causes output files assigned to a printer or card punch to be diverted to a tape backup file if the required output device is not available when the object program opens the file.

NOTE

If both the PBD and PBT options are set and both the BACKUP.DISK and BACKUP.TAPE file attributes are set in the program, then backup files go to tape if a tape unit is available. If a tape unit is not available, the backup file goes to disk.

RMOV 1

The RMOV option, when set, automatically removes the old file in DUPLICATE FILE ON DISK situations as though an RM command had been entered by the system operator.

RMSG

The RMSG option, when set, causes the MCP output message directed to remote terminals also to be displayed on the ODT. Remote messages are not displayed at the ODT if the RMSG option is reset, except for error messages that require attention of the system operator.

SCHM

The SCHM option causes the MCP to display a message when a program is placed in the schedule. The message has the following form.

<mix-number> <program-name> WILL USE <integer> KB,
SCHED PR = <schedule-priority>, IN FOR
<hours>:<minutes>:<seconds>.<tenths of a second>,
Q DEPTH = <depth in schedule>, JOB QUEUE = <class>

SQRM

The SMCP Queue and Remote Message (SQRM) option, when set, causes the code in the MICRO-MCP that handles queue and remote messages to be bypassed. This results in all such communicates being processed exclusively by the SMCP. When the SQRM option is reset, queue and remote messages are handled by the MICRO-MCP. However, the code from both the SMCP and MICRO-MCP can be resident in memory at certain times to handle exception conditions. In cases where system usage is extremely heavy and memory space is limited, an increase in throughput can be realized by setting the SQRM option.

TERM

The TERM option, when set, causes the MCP to automatically discontinue processing (DS) a program when an error condition is encountered. If an error condition occurs and it is necessary to automatically obtain a memory dump of the program, the TERM option must be reset, or the TRMD option must be set.

THR

The THR option, when set, causes the SYSTEM/INIT program to retain code in GISMO necessary to implement Level Two (Thrashing Detection) of the memory management system. Refer to appendix A for a complete description of the Level Two memory management system. A CLEAR/START operation is required after setting or resetting this option in order for the THR option to take effect. If the MPRI option is set, the GISMO code necessary to perform Thrashing Detection is retained regardless of the setting of the THR option.

TIME

The TIME option, when set, causes the ** TR PLEASE message to be displayed on the ODT at the end of a CLEAR/START operation. The TIME option is set at coldstart time. When the ** TR PLEASE message is displayed, the system operator must enter the time with the TR command before program execution can begin. Refer to the TR command in this section for complete information. The TIME option cannot be reset if the LOG option is set.

TRMD 0

The TRMD option, when set, causes the MCP to automatically dump memory and discontinue processing (DP) of a program when an error condition is encountered. If both the TERM and TRMD options are set, the TRMD option takes precedence.

VLCP 0

The VLCP option, when set, causes the SYSTEM/INIT program to retain code in GISMO to enable displaying of processor usage and overlay acitivity. Refer to appendix B for complete information concerning the performance monitoring system. A CLEAR/START operation is required to invoke the VLCP option.

VLIO 0

The VLIO option, when set, causes the SYSTEM/INIT program to retain code in GISMO to enable the display of activity on the I/O subsystem. Refer to appendix B for complete information concerning the performance monitoring system. Setting the VLIO system option, causes the VLCP code to be included as well. A CLEAR/START operation is required to invoke the VLIO option.

WFL 1

The WFL option, when set, causes WFL syntax to be used for processing ambiguous system commands; otherwise Control Card (CC) syntax is used. The default for the WFL option is SET. Several ODT-Commands, such as CHANGE, COMPILE, MODIFY, and REMOVE have two syntax diagrams. If these commands are prefixed with WFL, then WFL syntax is used; if these commands are prefixed with CC then Control Card syntax is used. When a prefix is not used, then the WFL option determines the syntax used. Additionally, the WFL option, if set, causes program names in all MCP messages to be displayed in TITLE format.

ZIP 1

The ZIP option, when set, causes all programmatic ZIP statements to be displayed on the ODT.

Task Options

Additionally, 13 system options may be applied to individual running tasks, taking precedence over the system setting of these options. Options in this category include BREL, CLOS, COPY, LIB, OPEN, PBD, PBF, PBT, RMOV, SCHM, TERM, TRMD, and ZIP.

OFF

In the 13.0 Release program names are displayed in different format from previous releases (EX: *ARP/QAUDIT vs ARP/QAUDIT). This option (Old File Format) when set causes the old naming convention to be used

INSTALLING NEW SYSTEM SOFTWARE UPDATES

The following is a suggested procedure for loading new system files. If some of the system software is not to be replaced, then those files may be omitted in the following steps.

Determine Current Operating Environment

Determine the names of the GISMO, MCPII, Micro MCP, SDL2 interpreter, SYSTEM/COPY, SYSTEM/INIT, SYSTEM/ODT, SYSTEM/PANDA, and the network controller files currently running on the system, by using the WW keyboard command as follows:

```
WW G/=;
WW M/=;
WW MM/=;
WW I/=;
WW CPY;
WW N/=;
WW O/=;
WW PAN/=
WW C/=;
```

The Name Table entries of concern are the G, M, MM, I, CPY, N, ODT, PAN, and C entries. In the following steps, it is assumed that the files in these entries have the names GISMO3, MCPII, MCPII/MICRO-MCP, SDL2/INTERP3M, SYSTEM/COPY SYSTEM/INIT, SYSTEM/ODT, SYSTEM/PANDA, and SYSTEM/CONTROLLER respectively. If the names are not the same, the different name may be substituted in the examples (such as substituting MMCP/DEBUG for MCPII/MICRO-MCP).

Copy the Software to be Replaced

Use the COPY command to make a copy of the current files to be replaced, GISMO3, MCPII, MCPII/MICRO-MCP, SDL2/INTERP3M, SYSTEM/INIT, SYSTEM/ODT, SYSTEM/PANDA, and SDL2INTRIN/AGGREGATE, to files named OLD/GISMO3, OLD/MCPII, OLD/MICRO-MCP, OLD/SDL2INT, OLD/SYSINIT, OLD/SYSODT, OLD/SYSPAN, and SDL2OLD/AGGREGATE respectively, as follows:

```
COPY GISMO3 AS OLD/GISMO3,
   MCPII AS OLD/MCPII,
   MCPII/MICRO-MCP AS OLD/MICRO-MCP,
   SDL2/INTERP3M AS OLD/SDL2INT,
   SYSTEM/INIT AS OLD/SYSINIT,
   SYSTEM/ODT AS OLD/SYSODT,
   SYSTEM/PANDA AS OLD/SYSPAN
   SDL2INTRIN/AGGREGATE AS SDL2OLD/AGGREGATE
   FROM DISK TO DISK;
```

Use Experimental Entries

Use the CM keyboard command to place the names of the current files, GISMO3, MCPII, MCPII/MICRO-MCP, SDL2/INTERP3M, SYSTEM/INIT, and SYSTEM/ODT into the experimental entries of the Name Table (as a precautionary measure) and the names of the copied files, OLD/GISMO, OLD/MCPII, OLD/MICRO-MCP, OLD/SDL2INT, OLD/SYSINIT, and OLD/SYSODT, into the standard entries of the Name Table, as follows:

```
CM GX GISMO3;
CM MX MCPII;
CM MMX MCPII/MICRO-MCP;
CM IX SDL2/INTERP3M;
CM NX SYSTEM/INIT;
CM ODX SYSTEM/ODT;
CM G OLD/GISMO3;
CM M OLD/MCPII;
CM MM OLD/MICRO-MCP;
CM I OLD/SDL2INT;
CM N OLD/SYSINIT;
CM ODT OLD/SYSODT;
CM PAN OLD/SYSPAN;
```

Loading a New SDL2 Interpreter

If loading a new SDL2 interpreter, the programs that must be running during this process must be modified to use an interpreter named MCP/INTERP. Therefore, modify the copied SYSTEM/ODT file, the SYSTEM/PANDA file, the SYSTEM/COPY file, and the network controller to use an interpreter named MCP/INTERP. When the MCP encounters MCP/INTERP, the interpreter that the program uses is made the same as the interpreter that the MCP is using. For example:

```
MODIFY OLD/SYSODT INTERPRETER MCP/INTERP;
MODIFY SYSTEM/COPY INTERPRETER MCP/INTERP;
MODIFY SYSTEM/CONTROLLER INTERPRETER MCP/INTERP;
MODIFY OLD/SYSPAN INTERPRETER MCP/INTERP;
```

Loading a New SDL2 Intrinsic File

If loading a new SDL2 intrinsic file, the programs that must be running during this process must be modified to use the copied intrinsic file. For example:

```
MODIFY OLD/SYSODT INTRINSIC.NAME SDL2OLD;
MODIFY SYSTEM/COPY INTRINSIC.NAME SDL2OLD;
MODIFY SYSTEM/CONTROLLER INTRINSIC.NAME SDL2OLD;
MODIFY OLD/SYSPAN INTRINSIC.NAME SDL2OLD;
```

CLEAR/START With OLD/Software

Perform a CLEAR/START operation. The currently running GISMO, MCPII, Micro MCP, SDL2 interpreter, SYSTEM/INIT, SYSTEM/ODT, and SYSTEM/PANDA files are now OLD/GISMO3, OLD/MCPII, OLD/MICRO-MCP, OLD/SDL2INT, OLD/SYSINIT, OLD/SYSODT, and OLD/SYSPAN, respectively.

Remove Old System Files

Remove the now unused files, GISMO3, MCPII, MCPII/MICRO-MCP, SDL2/INTERP3M, SYSTEM/INIT, SYSTEM/ODT, and SYSTEM/PANDA from the system disk, as follows:

```
CM GX PURGE;
CM IX PURGE;
CM MX PURGE;
CM MMX PURGE;
CM NX PURGE;
CM ODX PURGE;
REMOVE GISMO3;
REMOVE SDL2/INTERP3M;
REMOVE MCPII;
REMOVE MCPII/MICRO-MCP;
REMOVE SYSTEM/INIT;
REMOVE SYSTEM/ODT;
REMOVE SYSTEM/PANDA
```

NOTE

After removal of the SDL2/INTERP3M file, system programs (such as DMPALL) and compilers should not be run, except for OLD/SYSODT, OLD/SYSPAN, SYSTEM/COPY, and the modified network controller until the new SDL2 interpreter is copied.

Copy New System Files

Use the COPY AND COMPARE command to copy the new files, GISMO3, MCPII, MCPII/MICRO-MCP, SDL2/INTERP3M, SYSTEM/INIT, SYSTEM/ODT, and SYSTEM/PANDA to the system disk from either the disk or tape media provided. Also, if loading a new SDL2 intrinsic file, then copy the SDL2INTRIN/REMOVER program to the system disk. For example:

```
COPY AND COMPARE GISMO3, MCPII, MCPII/MICRO-MCP,
        SDL2/INTERP3M, SYSTEM/INIT, SYSTEM/ODT, SYSTEM/PANDA
        SDL2INTRIN/REMOVER FROM <media> TO DISK;
```

Loading Software into MCP Name Table

Use the CM keyboard command to place the names of the current GISMO, MCPII, Micro MCP, SDL2 interpreter, SYSTEM/INIT, and SYSTEM/ODT files into the experimental entries of the Name Table (as a precautionary measure) and the names of the new files, GISMO3, MCPII, MCPII/MICRO-MCP, SDL2/INTERP3M, SYSTEM/INIT, SYSTEM/ODT, and SYSTEM/PANDA into the standard entries of the Name Table, as follows:

```
CM GX OLD/GISMO3;
CM IX OLD/SDL2INT;
CM MX OLD/MCPII;
CM MMX OLD/MICRO-MCP;
CM NX OLD/SYSINIT;
CM ODX OLD/SYSODT;
CM G GISMO3;
CM I SDL2/INTERP3M;
CM M MCPII;
CM MM MCPII/MICRO-MCP;
CM N SYSTEM/INIT;
CM ODT SYSTEM/ODT;
CM PAN SYSTEM/PANDA
```

It is important that the new SDL2 interpreter that is CMed into the I Name Table Entry has the name SDL2/INTERP3M.

SYSTEM/COPY and SDL2 Intrinsic File

If loading a new SYSTEM/COPY or a new SDL2 intrinsic file, then use the COPY AND COMPARE command to copy the new SYSTEM/COPY file as NEW/SYSCOPY, and the new SDL2 intrinsic file as SDL2NEW/AGGREGATE. For example:

```
COPY AND COMPARE SYSTEM/COPY AS NEW/SYSCOPY,
        SDL2INTRIN/AGGREGATE AS SDL2NEW/AGGREGATE
        FROM <media> TO DISK;
```

Loading SYSTEM/COPY File

If loading a new SYSTEM/COPY file, then perform the following sequence of operations.

```
CM CPY NEW/SYSCOPY
CHANGE SYSTEM/COPY TO OLD/SYSCOPY;
COPY NEW/SYSCOPY AS SYSTEM/COPY;
CM CPY SYSTEM/COPY;
REMOVE NEW/SYSCOPY
```

Loading SDL2 Intrinsic File

If loading a new SDL2 intrinsic file, then execute the SDL2INTRIN/REMOVER program to mark the current SDL2INTRIN/AGGREGATE file as an unrestricted file, as follows:

```
EXECUTE SDL2INTRIN/REMOVER;
```

Remove the current SDL2INTRIN/AGGREGATE file, and change the name of the new SDL2INTRIN/AGGREGATE file to the proper name, as follows:

REMOVE SDL2INTRIN/AGGREGATE;
CHANGE SDL2NEW/AGGREGATE TO SDL2INTRIN/AGGREGATE;

Execute the SDL2INTRIN/REMOVER program to mark the new SDL2INTRIN/AGGREGATE file as a restricted system file, as follows:

EXECUTE SDL2INTRIN/REMOVER;

Network Controller

If the network controller was modified to a new SDL2 intrinsic name, then modify the intrinsic name back to the proper name. For example:

MODIFY SYSTEM/CONTROLLER INTRINSIC.NAME SDL2INTRIN;

CLEAR/START the New System Software

Perform a CLEAR/START operation to bring up the new system software.

Remove Old Software

The now unused files, OLD/GISMO3, OLD/MCPII, OLD/MICRO-MCP, OLD/SDL2INT, OLD/SYSCOPY, OLD/SYSINIT, OLD/SYSODT, OLD/SYSPAN, SDL2INTRIN/AGGREGATE can now be removed from the SYSTEM disk. For example:

CM GX PURGE;
CM IX PURGE;
CM MX PURGE;
CM MMX PURGE;
CM NX PURGE;
CM ODX PURGE;
REMOVE OLD/GISMO3;
REMOVE OLD/SDL2INT;
REMOVE OLD/MCPII;
REMOVE OLD/MICRO-MCP;
REMOVE OLD/SYSCOPY;
REMOVE OLD/SYSINIT;
REMOVE OLD/SYSODT;
REMOVE OLD/SYSPAN;
REMOVE SDL2OLD/AGGREGATE;

Experimental Name Table Entries

If the system normally has files in the experimental Name Table entries (such as MICRO-MCP/DEBUG in the MMX entry), the files can be copied to the system disk and entered into the appropriate entry in the Name Table with the CM system command.

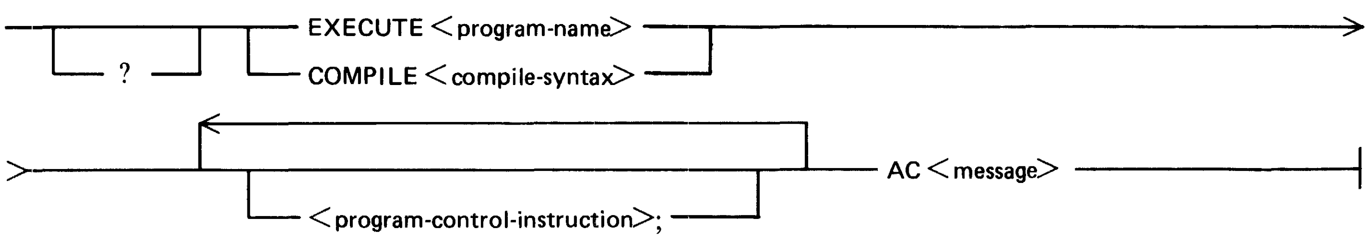
SECTION 4
PROGRAM CONTROL INSTRUCTIONS

This section contains a description of each program control instruction. These instructions are used to control the compilation, execution, modification, and query of programs.

AC

The AC program control instruction enables an early response to an ACCEPT message to be entered at the time a program is compiled or executed. It functions exactly like the AX program control instruction; however, it cannot be delimited with a semicolon (;) character. If a semicolon (;) character follows the AC keyword, it is treated as if it is a part of the early response.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE or COMPILE instruction.

<message>
: This field can contain any group of alphanumeric characters and is a message written to the program. <message> starts in the first position after the AC keyword. If <message> is shorter than the receiving field in the program, <message> is padded on the right with blank characters. If <message> is longer than the receiving field in the program, <message> is truncated on the right.

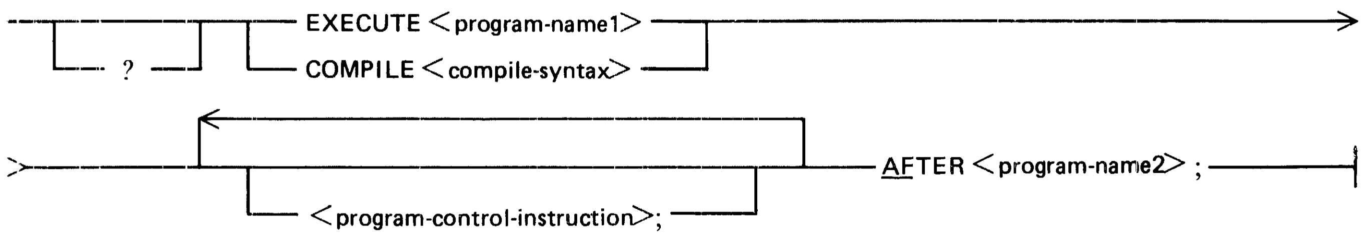
Example:

EXECUTE DMPALL;AC LIST TEST/PROGRAM ALPHA

AFTER

The AFTER program control instruction conditionally schedules a program after the termination of another program.

Syntax:



Semantics:

<program-name1>
  This field can contain any valid B 1000 program name.

<compile-syntax>
  For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
  This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE or COMPILE instruction.

<program-name2>
  This field can contain any valid B 1000 program name and specifies the name of an executing or scheduled to be executed program. The program execution specified by <program-name2> or the compile specified by <compile-syntax> must terminate before <program-name1> is performed.

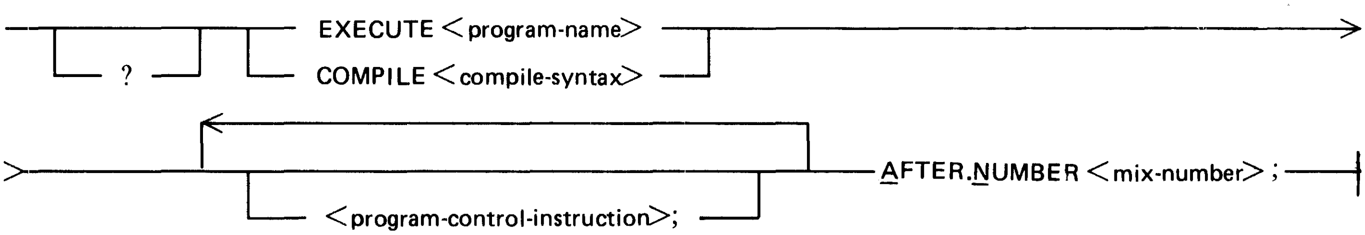
Example:

```
EXECUTE ALPHA AFTER BETA;     % When the program BETA goes to end
                              % of job, the program ALPHA is placed
                              % in the appropriate job queue for
                              % execution as soon as memory
                              % resources are available or the
                              % system mix limit permits.
```

AFTER.NUMBER

The AFTER.NUMBER program control instruction schedules a program after the termination of another program by mix number.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE or COMPILE instruction.

<mix-number>
: This field can contain any mix number of an executing or scheduled-to-be-executed program. The program specified by <mix-number> must terminate before the execution specified by <program-name> or the compile specified by <compile-syntax> is performed.

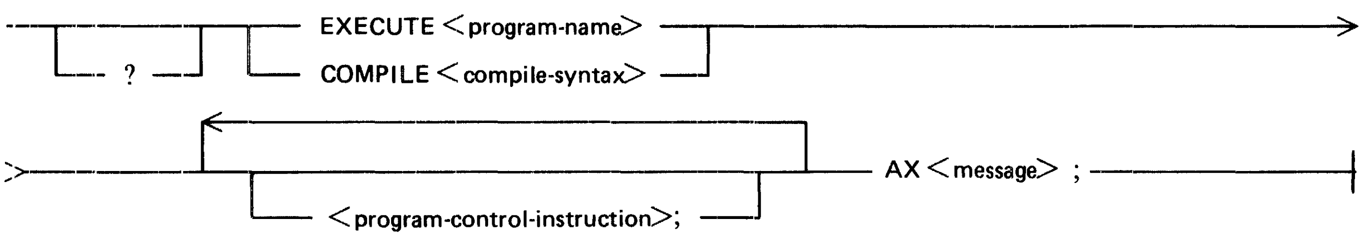
Examples:

```
EXECUTE ALPHA AFTER.NUMBER 7; % When the program (mix-number 7)
                              % goes to end of job, the program
                              % ALPHA is placed in the appropriate
                              % job queue for execution as soon
                              % as memory resources are available
                              % or the system mix limit permits.

EX ALPHA AN 8;
```

AX

The AX program control instruction enables an early response to an ACCEPT message to be entered at the time a program is compiled or executed. It functions exactly like the AC program control instruction; however, the semicolon (;) character can be used as a delimiter. If a semicolon (;) character follows the AX keyword, it terminates the early response and additional program control instructions can follow. The semicolon (;) character is not passed to the program.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE or COMPILE instruction.

<message>
This field can contain any group of alphanumeric characters and is a message written to the program. <message> starts in the first position after the AX keyword. If <message> is shorter than the receiving field in the program, <message> is padded on the right with blank characters. If <message> is longer than the receiving field in the program, <message> is truncated on the right.

Example:

EXECUTE DMPALL;AX LIST TEST/PROGRAM ALPHA;AX LIST TEST/PAYROLL;

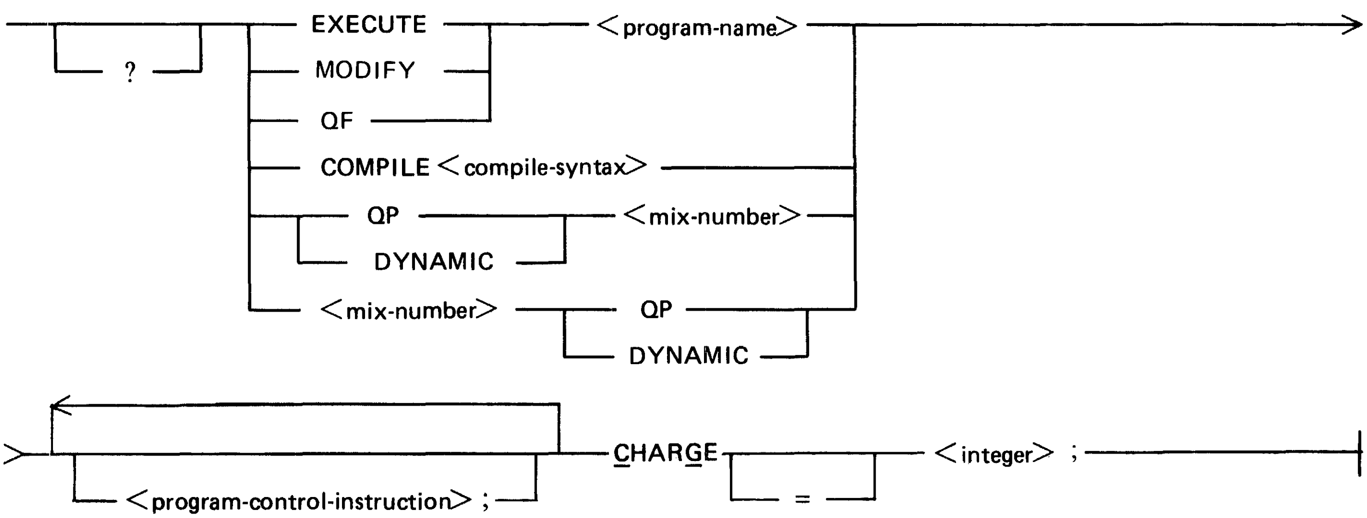
CHARGE

The CHARGE program control instruction inserts a charge number into the log record for a program.

If the MCP CHARGE option is set, the CHARGE program control instruction must be specified before a program is scheduled.

There are several ways in which the MCP assigns a charge number to a job: 1) a job can be assigned the charge number associated with the usercode under which it is executed, 2) a job can be assigned the charge number explicitly provided by the operator at execution (using the CHARGE program control attribute), 3) a spawned job can be assigned the charge number of the parent job, and 4) a job can be assigned the charge number provided by modifying (MODIFY MCP command) the charge attribute of the program to be executed. These four ways are listed in the order of priority in which the operating system assigns charge numbers, except that the first and second items in the list are reversed when the RR attribute has a value of 0 or 2.

Syntax:



Semantics:

<program-name>
    This field can contain any valid B 1000 program name.

<compile-syntax>
    For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
    This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
    This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<integer>

This field can contain any 1- to 7-digit number and specifies the charge number to be inserted in the MCP log file. If less than seven digits are specified, leading zeroes are assumed.

Pragmatics:

When running with restrictions (RR) equal to 1 or 3, an operator cannot modify a charge number from the usercode default value if the default value is non-zero.

Examples:

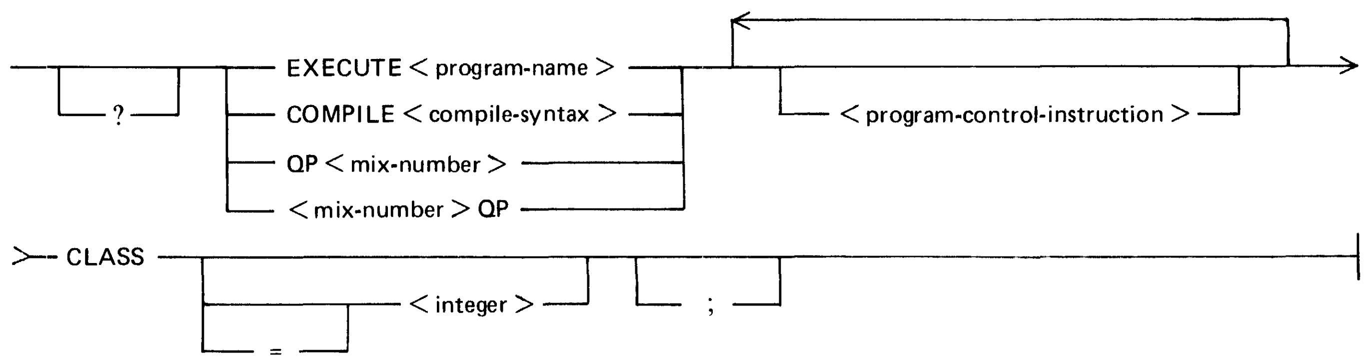
EXECUTE DMPALL CHARGE 31000;

MODIFY PROG1 CG 154;

CLASS

The CLASS program control instruction causes the job to be scheduled in a specific job queue. The absence of a CLASS keyword causes the job to be scheduled in the default queue, if existent, or the highest numbered job queue whose limits are not exceeded by the resource demands of the job if a default queue does not exist. Job queues allow the site to manage system throughput, limiting the number of jobs with high resource demands by scheduling them through job queues with small mixlimits, while similarly allowing smaller jobs to schedule through job queues with smaller resource limits but higher mixlimits. Refer to the MQ command in Section 5 for information about the creation of job queues, and to the DQ, JQ, LQ, and PQ commands, also in Section 5, for information about the manipulation and interrogation of job queues.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, COMPILE, or QP program control instruction.

<integer>
This field can contain any valid job queue number. Integer is used with CLASS for the EXECUTE and COMPILE program control instructions, but not with the QP system command.

Examples:

```
CO AR/ACCOUNTS/RECEIVABLE COBOL74B LI; CLASS=80; FI CARD...

EX THIS/SHOULD/FAIL; CLASS=6;
  EXECUTE THIS/*SHOULD/FAIL SYNTAX ERROR: NON-EXISTENT CLASS (6)
                                          SELECTED.
```

COMPILE

The COMPILE program control instruction designates the compiler to be used and the type of compilation to be performed.

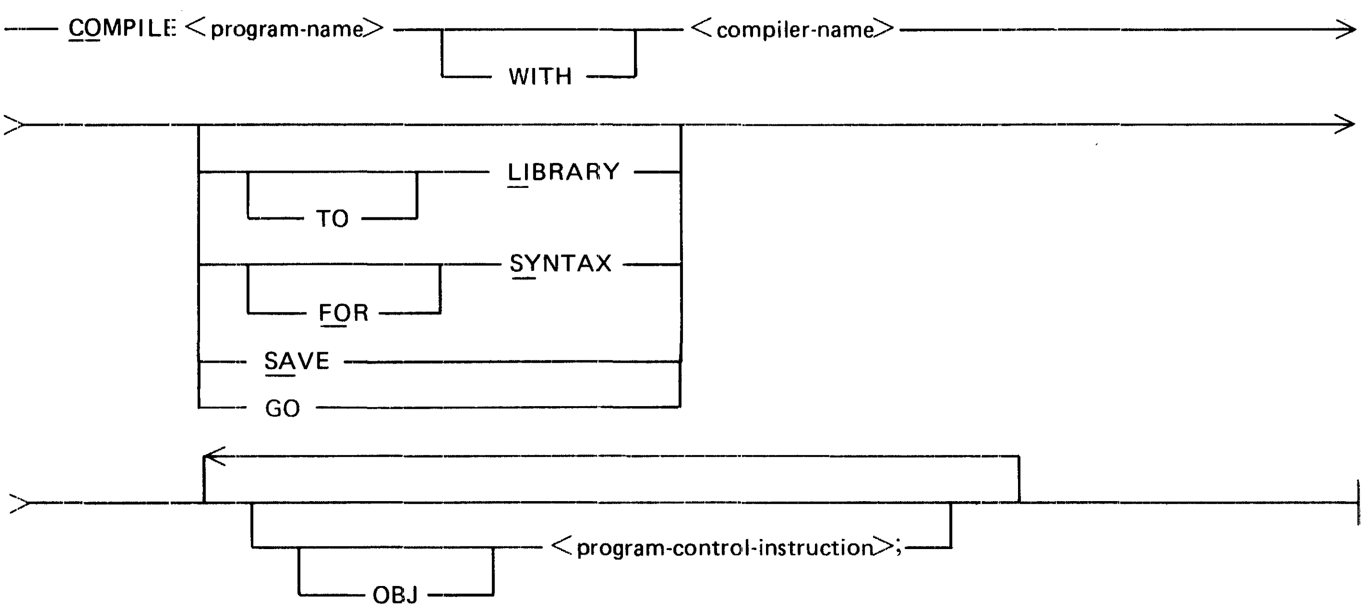
The syntax of the unabbreviated COMPILE program control instruction is determined by the setting of the WFL system option. For more information see the description of the WFL option in section 3. The syntax for the WFL version of the COMPILE program control instruction is in the *B 1000 Systems WFL Language Manual.*

The COMPILE program control instruction has four options.

1. The compile and go operation compiles the object program, executes the object program, and does not enter <program-name> in the disk directory. If the LIBRARY, SAVE, or SYNTAX keywords are not specified in the COMPILE instruction, the compile and go operation is invoked.
2. The compile to library operation compiles the object program and enters <program-name> into the disk directory. The LIBRARY keyword must be specified in the COMPILE instruction to invoke the compile to library operation.
3. The compile and save operation compiles the object program, executes the object program, and enters <program-name> into the disk directory. The SAVE keyword must be specified in the COMPILE command to invoke the compile and save operation.
4. The compile for syntax operation causes the compile to be for syntaxing only. This provides a compiler-generated listing for debugging, a first time compilation, or a new source listing.

If the COMPILE program control instruction is entered from a terminal with RR of 1, the MCPII automatically sets program switch 1 of the compiler to a value of 1.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 object program name that follows the B 1000 file-naming conventions.

<compiler-name>
This field can contain any valid B 1000 compiler name. BASIC, IBASIC, COBOL, COBOL74, FORTRAN, FORTRAN77, RPG, UPL, and UPL2 are examples of valid B 1000 compiler names.

LIBRARY
The LIBRARY keyword causes <program-name> to be entered in the disk directory if the compilation completes without a syntax error. The object program is not scheduled for execution.

SYNTAX
The SYNTAX keyword causes the compiler to check for syntax errors but not to generate an object program. This provides a diagnostic listing as output to be used as a debugging tool, a first time compilation, or a new source listing. <program-name> is not entered in the disk directory.

SAVE
The SAVE keyword causes <program-name> to be entered in the disk directory and executes the object program if the compilation completes without a syntax error.

GO
The GO keyword causes the object program to be executed if the compilation completes without a syntax error. The program, <program-name>, is not entered in the disk directory.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow a COMPILE program control instruction.

OBJ
The OBJ keyword represents the OBJ program control instruction. It specifies that the <program-control-instruction> that follows applies to the object program specified by <program-name>. If the OBJ keyword is not present, the <program-control-instruction> that follows applies to the compiler specified by <compiler-name> instead of the object program. All <program-control-instruction>s preceded by the OBJ keyword are queued by the MCP and, following successful compilation, are used to perform an automatic MODIFY program control instruction on the object program. Only those <program-control-instruction>s that are allowed to follow the MODIFY program control instruction can be used following the OBJ keyword.

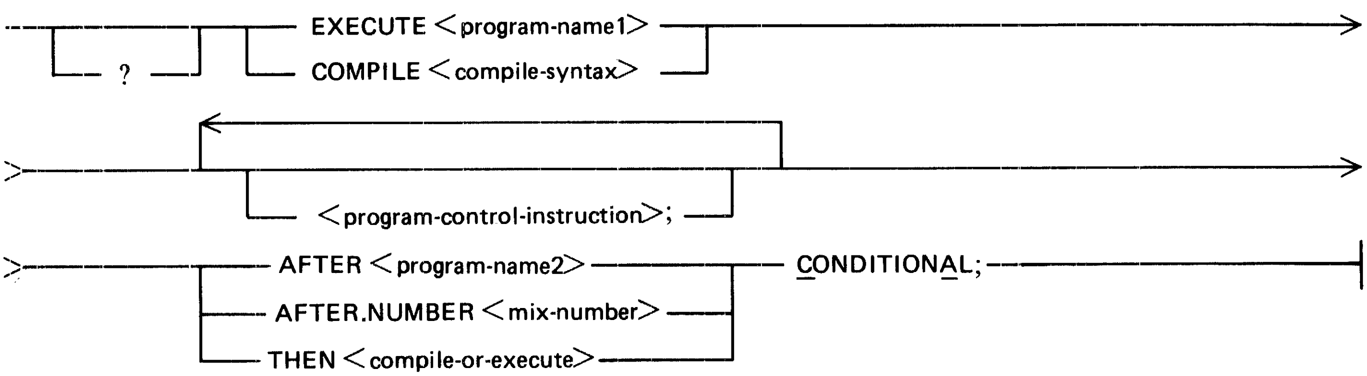
Examples:

```
COMPILE MONTHLY/UPDATER WITH COBOL74B TO LIBRARY; FILE CARD
    NAME MASTER/SOURCE/MONTHLY DISK; FILE LINE NO HARDWARE;
    OBJ FILE INVENTORY PACK.ID QPACK; OBJ PRIORITY 7

CO MONTHLY/UPDATER COBOL74B LI; FI CARD NAM MASTER/SOURCE/MONTH
   DSK; FI LINE NO HAR; OBJ FI INVENTORY PID QPACK; OBJ PR 7;
```

CONDITIONAL

The CONDITIONAL program control instruction inhibits a program from being executed unless its predecessor successfully reaches end of job without an error. This instruction is used in conjunction with the AFTER, AFTER.NUMBER, and THEN program control instructions. The CONDITIONAL program control instruction is a default instruction. The UNCONDITIONAL.EXECUTION program control instruction can be used to change the default.

Syntax:



Semantics:

<program-name1>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE or COMPILE instruction.

<program-name2>
: This field can contain any valid B 1000 program name and specifies the name of an executing or scheduled to be executed program. The program specified by <program-name2> must terminate without an error before the execution specified by <program-name1> or the compile specified by <compile-syntax> is performed.

<mix-number>
: This field can contain any mix number of an executing or scheduled to be executed program. The program specified by <mix-number> must terminate without an error before the execution specified by <program-name1> or the compile specified by <compile-syntax> is performed.

<compile-or-execute>
: This field can contain any valid COMPILE or EXECUTE program control instruction.

Examples:

EXECUTE A/B AFTER C/D; CONDITIONAL;

EXECUTE A/B; AF C/D; CA;

DATA

The DATA program control instruction informs the MCP of the name of a punched card data file.

When a DATA program control instruction follows immediately after a COMPILE or EXECUTE program control instruction, the MCP saves the card reader device for the program specified in the COMPILE or EXECUTE instruction. This prevents any other program in the mix that requests a card file with the file identifier specified in the DATA program control instruction from being assigned the card file belonging to the program just executed. The MCP does not reserve the card reader device in this manner if an END program control instruction is detected before the DATA program control instruction.

Syntax:

```
──┬─────────┬── DATA <file-identifier>; ──────────────────┤
  └─── ? ───┘
```

Semantics:

<file-identifier>

This field can contain any two-name file identifier and specifies the name of the card file that immediately follows the DATA program control instruction.

?

The question mark character or an invalid punch in column one can be used with 96-column cards. An invalid punch must be used with 80-column cards.

Example 1:

```
?EXECUTE A/B CHARGE 123456;
?DATA CARDIN
      .
      . (data cards)
      .
?END
```

Example 2:

```
?COMPILE TEST/PROGRAM COBOL74 LIBRARY DATA CARDS
      .
      . (data cards)
      .
?END
```

Example 3:

```
?EXECUTE TEST/PROGRAM MEMORY 12000;
?CHARGE 12666;
?FILE CARDS NAME = TEMP DISK;
?END
?DATA CARDFILE
      .
      . (data cards)
      .
?END
```

DYNAMIC

The DYNAMIC program control instruction modifies the working copy of an object program that is executing or is scheduled for execution.

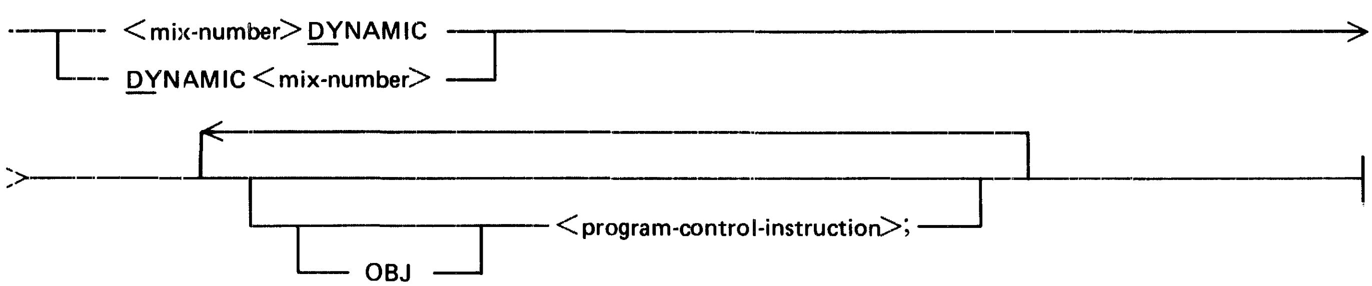
The following program control instructions are allowed to be used with the DYNAMIC instruction while an object program is scheduled for execution and has not reached beginning of job (BOJ).

CHARGE	NODIF
CONDITIONAL	OBJ
DYNAMIC.SPACES	OPTION
FILE	OVERRIDE
FREEZE	PRIORITY
INTERPRETER	PROCESSOR.PRIORITY
INTRINSIC.DIRECTORY	SECOND.BEFORE.DECAY
INTRINSIC.NAME	SWITCH
INVISIBLE	TIME
MAXTIME	UNCONDITIONAL
MAXWAIT	UNFREEZE
MEMORY	UNOVERRIDE
MEMORY.STATIC	VIRTUAL.DISK
MEMORY.PRIORITY	

After an object program has reached beginning of job (BOJ), the only program control instructions that have any effect are those that are specified using the FILE program control instruction. In addition, the file being referenced in the FILE program control instruction must be completely closed with the RELEASE, LOCK, CRUNCH, or PURGE close options. The only exceptions to this are the following FILE attributes, which can be dynamically modified while the file is open.

AUTOPRINT
END.OF.PAGE
INVALID.CHARACTERS
LOCK

Syntax:



Semantics:

<mix-number>
This field can contain any mix number of an executing or scheduled program.

<program-control-instruction>
This field can contain any valid program control instruction described in this section that is allowed to follow a DYNAMIC program control instruction.

OBJ
The OBJ keyword represents the OBJ program control instruction. It specifies that the <program-control-instruction> that follows applies to the object program of a compilation. The OBJ keyword can only be used when <mix-number> refers to a compilation. All <program-control-instruction>s preceded by the OBJ keyword are queued by the MCP and, following successful compilation, are used to perform an automatic MODIFY program control instruction on the object program. Only those <program-control-instruction>s that are allowed to follow the MODIFY program control instruction can be used following the OBJ keyword.

Examples:

```
DYNAMIC 9171 PRIORITY = 5;SB = 20;FILE LINE LABEL.TYPE = 1;

DY 25 FILE PRINT INVALID.CHARACTERS = 3;

2000 DYNAMIC FILE TAPE UNIT.NAME = MTA;
```

DYNAMIC.SPACES

The DYNAMIC.SPACES program control instruction assigns additional dynamic memory, beyond that specified in the MEMORY program control instruction, for memory links that are found in the overlayable data space of a program.

The MCP assigns a value of ten at execution time if the DYNAMIC.SPACES value is zero for a task using dynamic memory. The DYNAMIC.SPACES program control instruction is normally specified only if a precisely calculated value is specified for dynamic memory; if it is not specified or provided by the MCP, the space for required memory links uses part of the precise value provided by the user, causing fewer pages of overlayable data than intended to reside in dynamic memory.

For example:

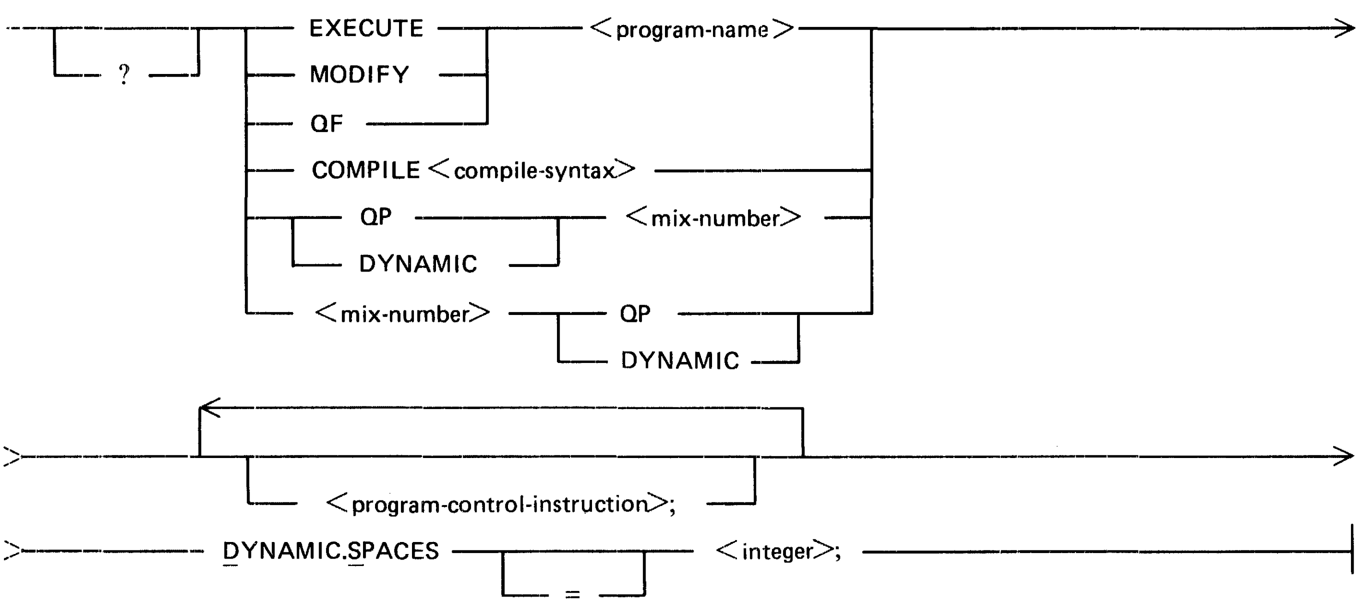
EXECUTE EXPORT/PAYROLL;MEMORY 21300;DYNAMIC.SPACES=8;

In this example, the MCP assigns the program EXPORT/PAYROLL 21300 bits of dynamic memory plus the following:

(DYNAMIC.SPACES + 2) * <memory-link-size>

where <memory-link-size> is currently 187 bits. The space for two extra memory links provide for the header and trailer links which delimit the overlayable data area of a program. Therefore, in the example, the MCP actually assigns 21300 + ((8+2)*187) = 23170 bits of dynamic memory to the program when it is scheduled.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled to be executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<integer>
This field specifies the number of additional memory links to be used in conjunction with programs that have dynamic memory.

END

The END program control instruction informs the MCP that the card data input has reached the end of file (EOF).

When the END program control instruction is used, it must be the last card in the file. A program receives an end-of-file report from the MCP when the program attempts to read the END program control instruction.

The END program control instruction is not required at the end of card data input if the program recognizes the last card in the file and closes that file without reading another record. If the program attempts to read another record from that file and the card reader is empty, the MCP holds the card reader waiting for more data or an END program control instruction.

A card file need not be terminated by an END input card if it is immediately followed by another control card. The detection of this other control card by the MCP results in an end of file signal to the program, as though an END card had been read.

If a data card with an invalid punch character in column one is read, the MCP stops the card reader and notifies the operator that the card just read has an invalid punch in column one. This allows the operator to correct the card and permits the program to continue reading cards.

The END program control instruction can also separate a following DATA program control instruction from a preceding EXECUTE or COMPILE program control instruction when it is desired to disassociate the data file from the program specified in the EXECUTE or COMPILE instruction. This is the only case in which the END program control instruction can appear on the same card as other control instructions, and without a question mark (?) or invalid character in column one.

If the END program control instruction is used in text zipped to the MCP, no information following it is processed by the MCP.

Syntax:

```
--+-------+-- END --+---------------------+-- ; ------------------|
  |       |         |                     |
  +-- ? --+         +-- <file-identifier> +
```

Semantics:

<file-identifier>

This field can contain any valid two-name file identifier and specifies the file name of the card file in the previous DATA program control instruction.

?

The question mark character or an invalid punch in column one can be used with 96-column cards. An invalid punch must be used with 80-column cards.

Example 1:

```
?EXECUTE A/B;
?DATA CARDS;
        .
        .(data cards)
        .
?END CARDS;
```

Example 2:

```
?COMPILE X/Y FORTRAN77 DA CARDS
        .
        .(data cards)
        .
?END CARDS;
```

Example 3:

```
?EX TEST END;
?DATA CARDFIL;
        .
        .(data cards)
        .
?END CARDFILE;
```

ENDCTL

The ENDCTL (End Control) program control instruction indicates to the MCP that the input file to the SYSTEM/LDCONTRL program has reached the end of the file.

The ENDCTL program control instruction must be the last card in an input file read by the SYSTEM/LDCONTRL program. This file is often called the control deck. The ENDCTL program control instruction causes the MCP to notify the SYSTEM/LDCONTRL program that the end of the control deck has been reached and closes all files in use and sends the SYSTEM/LDCONTRL program to end of job.

Refer to the LD system command in Section 5 of this manual and the SYSTEM/LDCONTRL program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the SYSTEM/LDCONTRL program.

Syntax:

```
—— ?ENDCTL; ——————————————————————————————————————————|
```

Example:

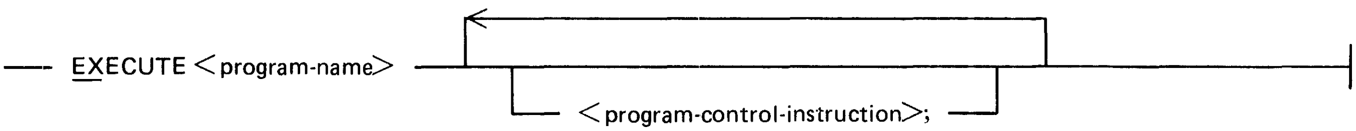
```
?DATA CTLDCK;
?COMPILE TEST RPG LIBRARY;
?DATA CARD;
      .
      .(data cards)
      .
?END CARD;
?COMPILE TESTER FORTRAN77 LIBRARY;
?DATA CARD;
      .
      .(data cards)
      .
?END CARD;
?ENDCTL;
```

EXECUTE

The EXECUTE program control instruction causes the MCP to call an object program from the library for subsequent execution. The EXECUTE program control instruction must be the first program control instruction in a set of program control instructions pertaining to the execution of an object program.

If <program-name> resides on a user disk, the disk identifier must be part of the object program in order for the MCP to locate the correct file.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 object program name that follows the B 1000 file-naming conventions and specifies the program to be executed.

<program-control-instruction>
: This field can contain any valid program control instruction described in this section that is allowed to follow an EXECUTE program control instruction.

Examples:

```
EXECUTE TEST FILE DATA NAME MASTERFILE;

?EXECUTE PROG1      % Executes the object program labeled
?DATA CARDS         %PROG1 through a card reader using
    .               % a card deck delimited by ?DATA CARDS and
  (data cards)      % ?END as beginning and terminating
    .               % records, respectively. The PROG1 program
?END                % declared a card file labeled CARDS.
```

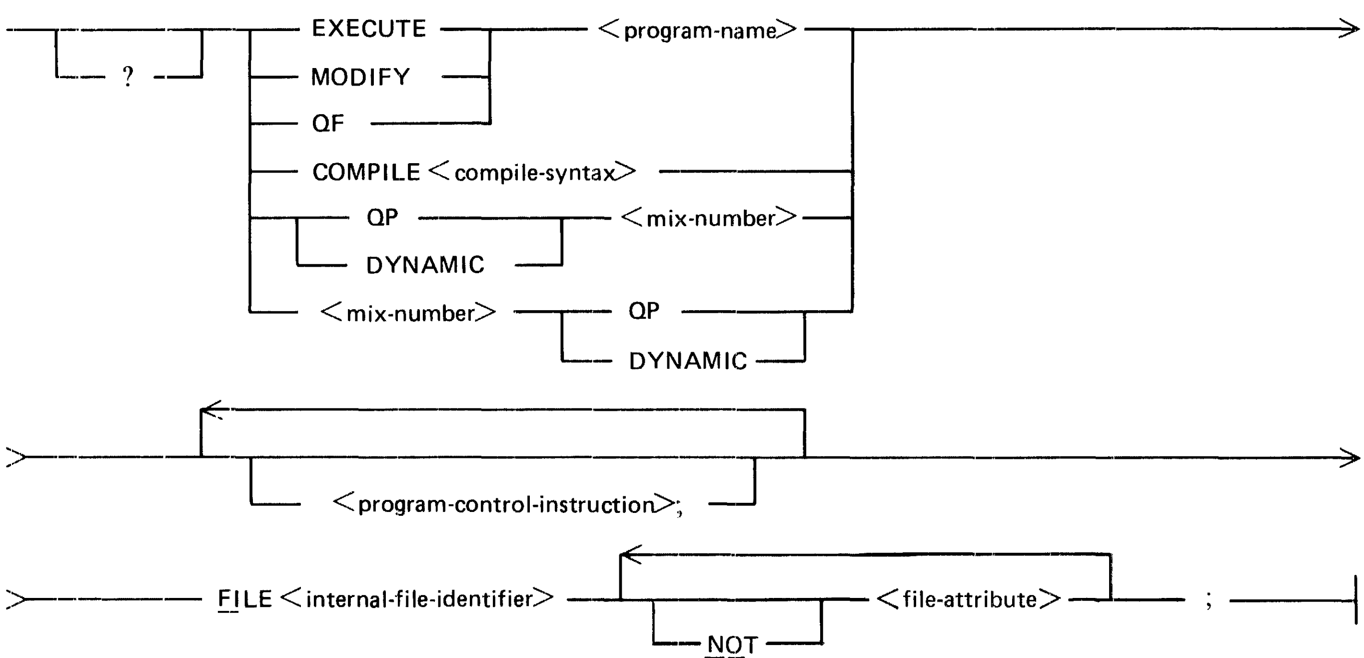
FILE

The FILE program control instruction specifies various file attributes for input and output files.

The elements within the FILE program control instruction must be separated by at least one blank character, and must be terminated with a semicolon (;) character or END OF MESSAGE. If the FILE program control instruction is entered by way of a card reader, each of the continuation cards must have a question mark (?) character in column one.

The FILE program control instruction must immediately follow the COMPILE, EXECUTE, DYNAMIC, or MODIFY program control instructions. The MCP modifies the information in a working copy of the File Parameter Block (FPB) of the program.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled to be executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

```
EXECUTE A/B FILE MASTER NAME MASTER/NEW DISK DEFAULT;
MODIFY PROG1 FI LINE USER.BACKUP.NAME NAME #PROG1 NO HARDWARE;
```

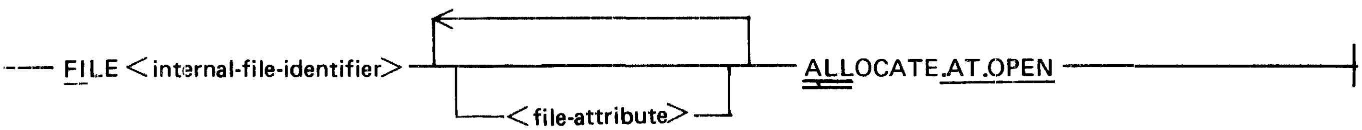
File Attributes

A description of each file attribute that can follow the FILE program control instruction follows.

ALLOCATE.AT.OPEN

The ALLOCATE.AT.OPEN file attribute causes all of the disk file areas requested by this file to be allocated at the time the file is opened.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

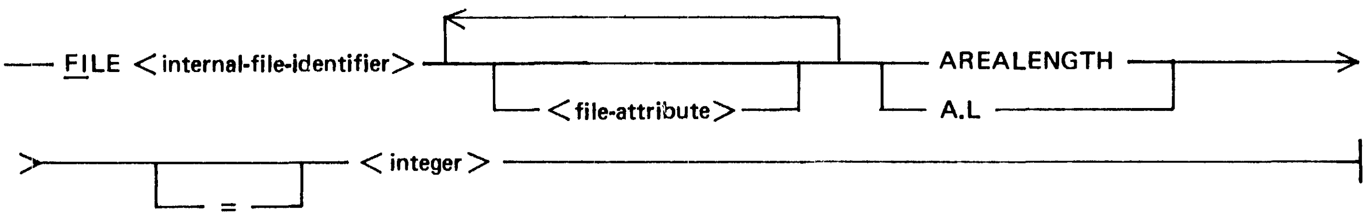
EXECUTE A/B FILE MASTER ALLOCATE.AT.OPEN;

MODIFY PROG1; FI PAYROLL ALL;

AREALENGTH

The AREALENGTH file attribute allows the user to specify the maximum size of one disk area of the file. Please notice that the AREALENGTH attribute and the BLOCKS.PER.AREA attribute are mutually exclusive. Assigning a value to one of these attributes causes the other to be set to zero. AREALENGTH may be set to a maximum value of 2,097,152 bits, though this number may be modified by the operating system when the file is opened to make AREALENGTH an even multiple of BLOCKSIZE and also to satisfy any maximum that may be imposed by the disk hardware.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 1 to 2,097,152, and specifies the area length in bits.

Examples:

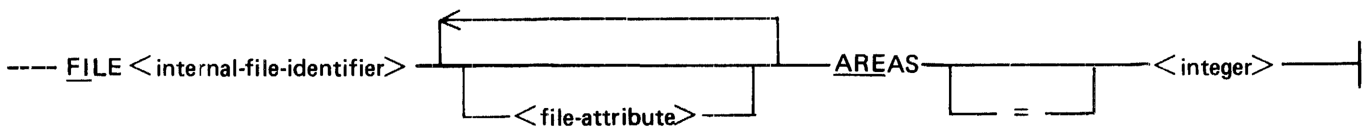
EXECUTE A/B; FILE MASTER AREALENGTH = 10000;

MODIFY PROG1; FILE PAYROLL A.L 50000;

AREAS

The AREAS file attribute specifies the number of disk areas assigned to the file. The number of disk areas can range from 1 to 105 inclusive. This file attribute applies only to new files.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 1 to 105 inclusive, and specifies the number of disk areas assigned to the file.

Examples:

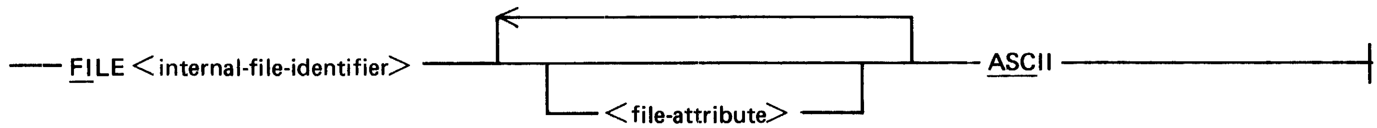
EXECUTE A/B; FILE MASTER AREAS = 50;

MODIFY PROG1; FILE PAYROLL ARE 105;

ASCII

The ASCII file attribute specifies the recording mode to be the American Standard Code for Information Interchange (ASCII) recording mode. This attribute is only applicable for magnetic tape files.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

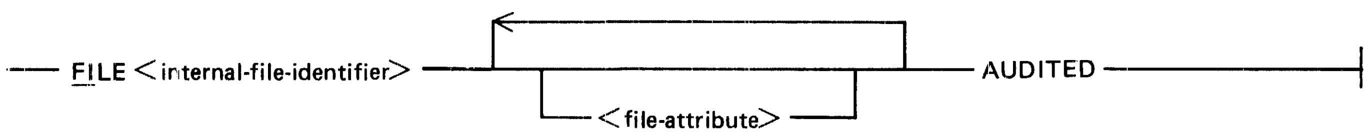
EXECUTE A/B; FILE MASTER ASCII;

MODIFY PROG1; FILE PAYROLL ASC;

AUDITED

The AUDITED file attribute causes a task that is performing an input/output operation on a file to be suspended until the physical operation is complete. When a task performs an output operation on an ISAM file that has the AUDITED file attribute set, the task is suspended until the physical write operations on the data file and index files are complete. If a system halt occurs during an output operation to a file that has the AUDITED file attribute set, the maximum amount of information that can be lost is one record.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

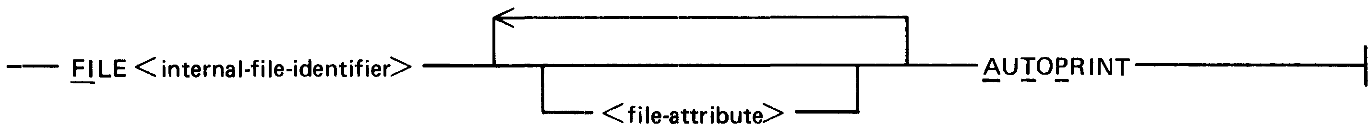
EXECUTE A/B; FILE MASTER AUDITED;

MODIFY PROG1; FILE VERIFY AUDITED;

AUTOPRINT

The AUTOPRINT file attribute causes the backup printer disk file to be entered in the MCP autoprint queue when the file is closed. This file attribute is set by default. Specifying NO AUTOPRINT prevents the backup printer disk file from being processed by the MCP autoprint mechanism.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

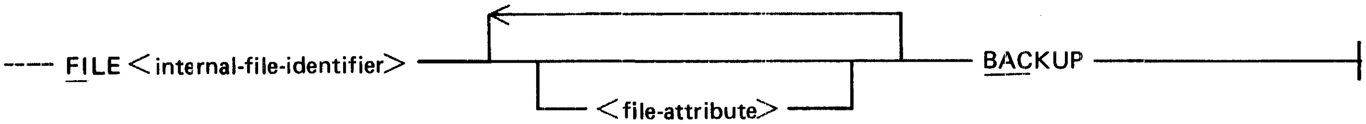
EXECUTE A/B; FILE LINE AUTOPRINT;

MODIFY PROG1; FILE LINE NO ATP;

BACKUP

The BACKUP file attribute permits the output of a printer or punch file to go to backup. This file attribute sets the BACKUP.DISK and BACKUP.TAPE file attributes for this file by default.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

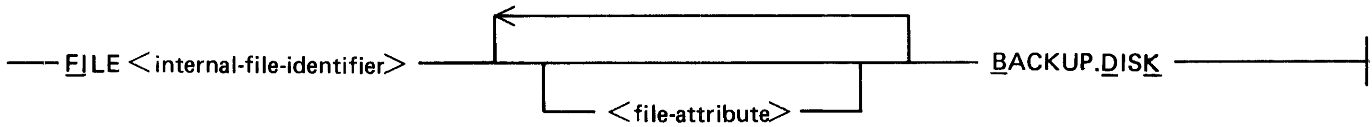
Examples:

```
EXECUTE A/B; FILE LINE BACKUP
MODIFY PROG1; FILE LINE BAC
```

BACKUP.DISK

The BACKUP.DISK file attribute permits the output of the file to go to disk backup if the PBD MCP option is set.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

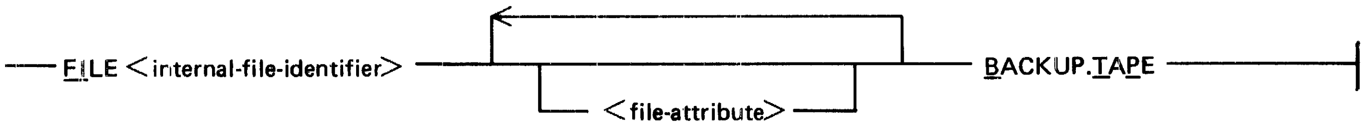
EXECUTE A/B; FILE LINE BACKUP.DISK;

MODIFY PROG1; FILE LINE BDK;

BACKUP.TAPE

The BACKUP.TAPE file attribute causes the output of the file to go to tape backup if the PBT MCP option is set.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

EXECUTE A/B; FILE LINE BACKUP.TAPE;

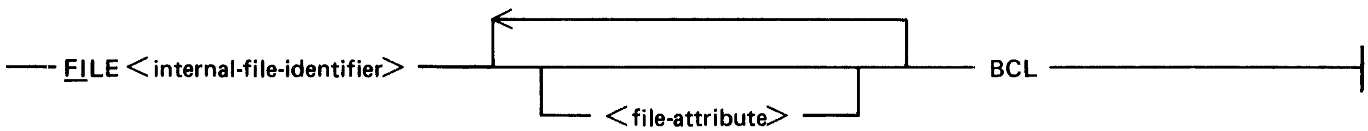
MODIFY PROG1; FILE LINE BTP;

CO EXAMPLE COBOL74B LI; FI LINE BTP NO BDK;

BCL

The BCL file attribute specifies the recording mode to be the BCL recording mode. This attribute is only applicable for card and paper tape files.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

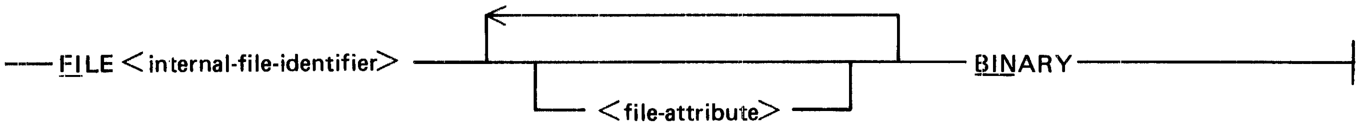
EXECUTE A/B; FILE MASTER BCL;

MODIFY PROG1; FILE PAYROLL BCL;

BINARY

The BINARY file attribute specifies the recording mode to be the binary recording mode and is used only for 80-column card and paper tape devices.

Syntax:



Semantics:

<internal-file-identifier>
    This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
    This field can contain any valid file attribute described in this section.

Examples:

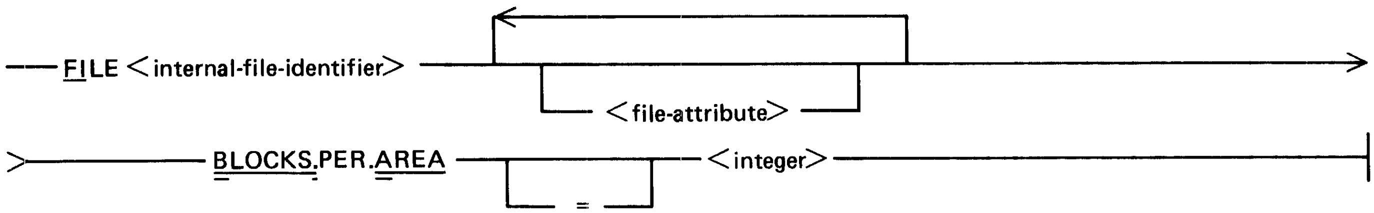
    EXECUTE A/B; FILE MASTER BINARY;

    MODIFY PROG1; FILE PAYROLL BIN;

BLOCKS.PER.AREA

The BLOCKS.PER.AREA file attribute assigns the number of physical records (blocks) to each disk area. This file attribute applies only to new files.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 1 to 16,777,215 inclusive, and specifies the number of physical records (blocks) per area of disk for this file.

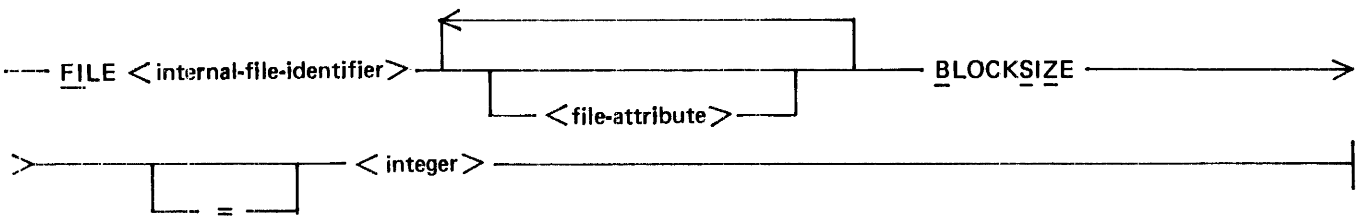
Examples:

```
EXECUTE A/B; FILE MASTER BLOCKS.PER.AREA = 30;
MODIFY PROG1; FILE PAYROLL B.A 40;
```

BLOCKSIZE

The BLOCKSIZE file attribute specifies the number of characters that are contained in one physical record (block) of the file. Please notice that the BLOCKSIZE attribute and the RECORDS.PER.BLOCK (R.B) attribute are mutually exclusive. Assigning a value to one of these attributes causes the other to be set to zero. The value of the BLOCKSIZE file attribute must not be set to a value greater than 65,535 bits. The value of the BLOCKSIZE file attribute must be an integral multiple of the value of the RECORD.SIZE file attribute.

Syntax:



Semantics:

<internal-file-identifier>
    This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
    This field can contain any valid file attribute described in this section.

<integer>
    This field can contain any integer in the range 1 to 8192, and specifies the block size in bytes.

Examples:

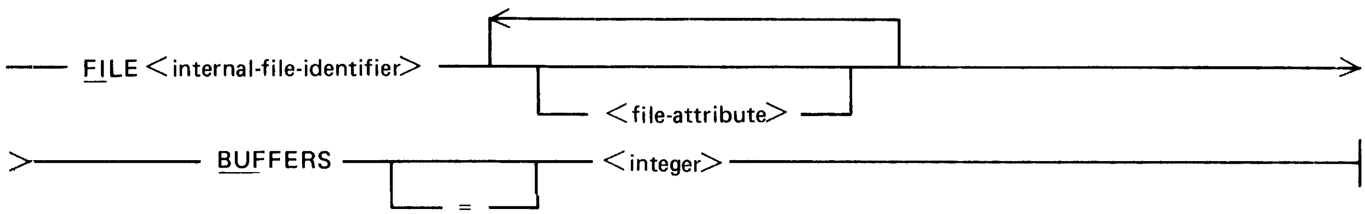
    EXECUTE A/B; FILE MASTER BLOCKSIZE = 1000;

    MODIFY PROG1; FILE PAYROLL BSZ 360;

BUFFERS

The BUFFERS file attribute assigns the number of buffers for the file. If a value of zero is specified, the MCP assigns one buffer when the file is opened. For files with a device type of QUEUE, the BUFFERS file attribute specifies the maximum number of messages allowed in memory at any one time. For files with a device type of REMOTE, the BUFFERS file attribute specifies the maximum number of messages in the input queue allowed in memory at any one time.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 1 to 255 inclusive, and specifies the number of buffers to be used for the file.

Examples:

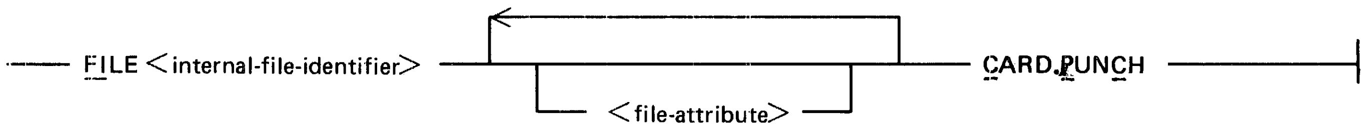
EXECUTE A/B; FILE MASTER BUFFERS = 3;

MODIFY PROG1; FILE QUEUE BUF 255;

CARD.PUNCH

The CARD.PUNCH file attribute specifies that the output file is to be sent to the card punch.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

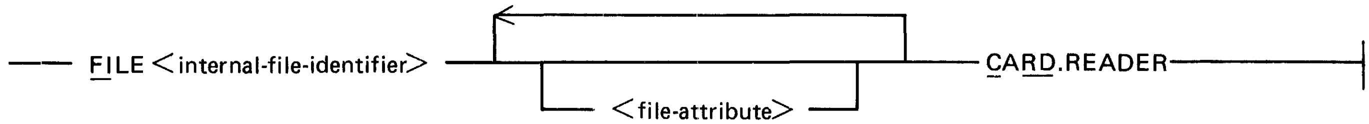
EXECUTE A/B; FILE PUNCH CARD.PUNCH;

MODIFY PROG1; FILE OUTFILE CPC;

CARD.READER

The CARD.READER file attribute specifies that the input file is located on the card reader.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

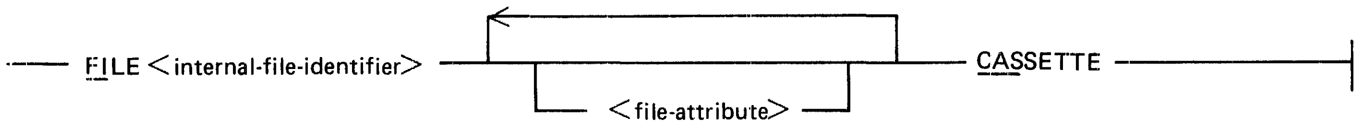
EXECUTE A/B; FILE INPUT CARD.READER;

MODIFY PROG1; FILE CARDIN CRD;

CASSETTE

The CASSETTE file attribute specifies that the file to be processed is located on a cassette. The cassette drive is a separate peripheral unit, not the built-in console cassette used to perform a CLEAR/START operation on most B 1000 systems.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

```
EXECUTE A/B; FILE MASTER CASSETTE;
MODIFY PROG1; FILE CASFILE CAS;
```

COPY

The COPY file attribute causes the File Parameter Block (FPB) of one file to be copied to the FPB of a receiving file. The internal file identifier of the receiving file is not changed.

Syntax:

```
--- FILE <internal-file-identifier1> COPY <internal-file-identifier2> FROM ----------->

>-----+-- MIX.NUMBER --+-- <mix-number> --+----------------|
      |                |                  |
      +-- # -----------+                  |
      |                                   |
      +-- PROGRAM.NAME <program-name> ----+
```

Semantics:

<internal-file-identifier1>
: This field can contain any valid internal file identifier of a program and specifies the file for which the FPB is being changed.

<internal-file-identifier2>
: This field can contain any valid internal file identifier of a program and specifies the file from which the FPB is copied.

<mix-number>
: This field can contain any mix number of an executing program and specifies the program containing the file from which the FPB is copied.

<program-name>
: This field can contain any 30-character file name of a program that is currently executing on the system and specifies the program containing the file from which the FPB is copied.

Examples:

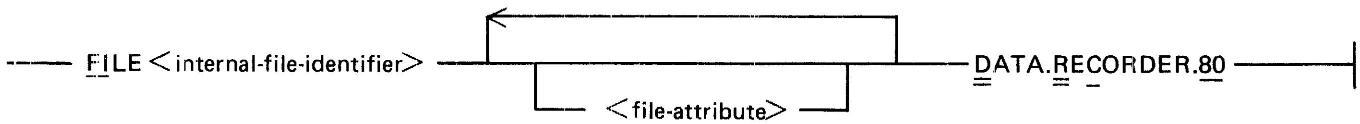
EXECUTE A/B; FILE MASTER COPY MASTERFILE FROM MIX.NUMBER 10;

MODIFY PROG1; FILE PAYROLL CPY PAYSAVE FROM PROGRAM.NAME PAYSAVE;

DATA.RECORDER.80

The DATA.RECORDER.80 file attribute specifies that the file is associated with the data recorder.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

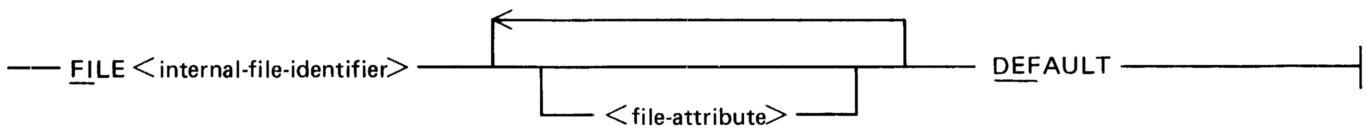
EXECUTE A/B; FILE MASTER DATA.RECORDER.80;

MODIFY PROG1; FILE OUTFILE DR80;

DEFAULT

The DEFAULT file attribute overrides the declared block and record sizes and uses the block and record sizes contained in the existing disk file header or tape label instead. This file attribute applies only to input disk files and labeled tape files created on B 7800/B 7700, B 6800/B 6700, and B 1000 systems. This file attribute applies only to existing files.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

EXECUTE A/B; FILE MASTER DEFAULT;

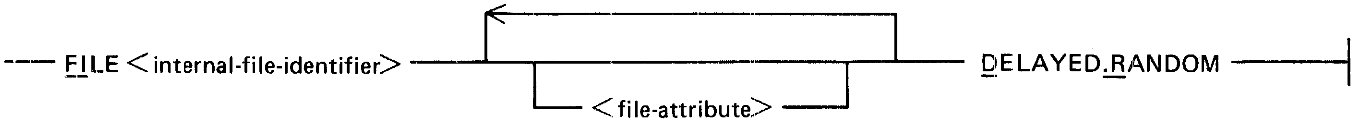
MODIFY PROG1; FILE PAYROLL DEF;

COMPILE TEST RPG LIBRARY; FILE CARDS NAME SOURCE/FILE DISK DEFAULT;

DELAYED.RANDOM

The DELAYED.RANDOM file attribute specifies that the file-access method is delayed random. Refer to Appendix C for a complete description of the delayed random file-access method.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

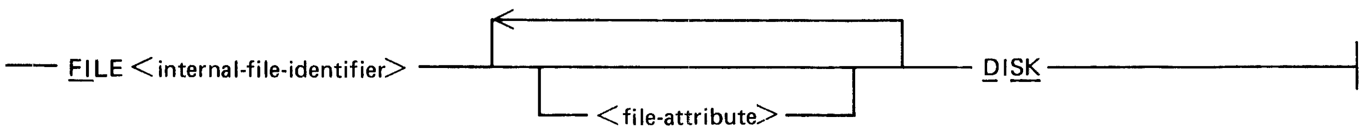
EXECUTE A/B; FILE MASTER DELAYED.RANDOM;

MODIFY PROG1; FILE PAYROLL D.R;

DISK

The DISK file attribute specifies that the file is located on disk, regardless of the compiled program declaration.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

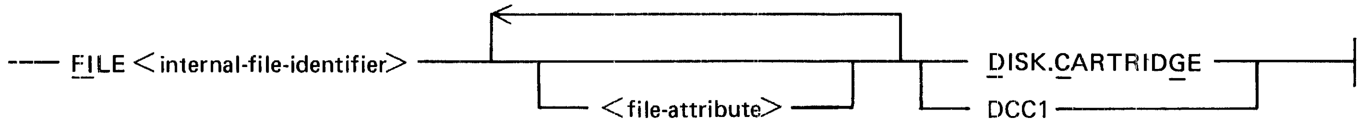
EXECUTE A/B; FILE MASTER DISK;

MODIFY PROG1; FILE INPUT DSK;

DISK.CARTRIDGE

The DISK.CARTRIDGE file attribute specifies that the file to be processed is located on a disk cartridge.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

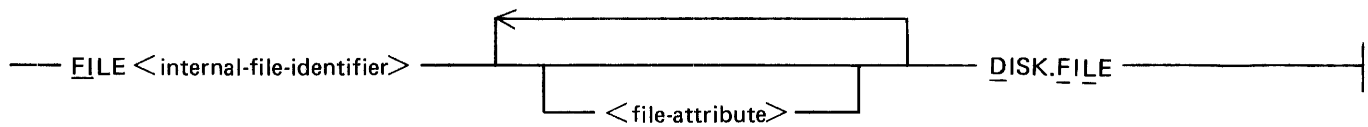
EXECUTE A/B; FILE MASTER DISK.CARTRIDGE;

MODIFY PROG1; FILE INPUT DCG;

DISK.FILE

The DISK.FILE file attribute specifies that the file to be processed is located on disk.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

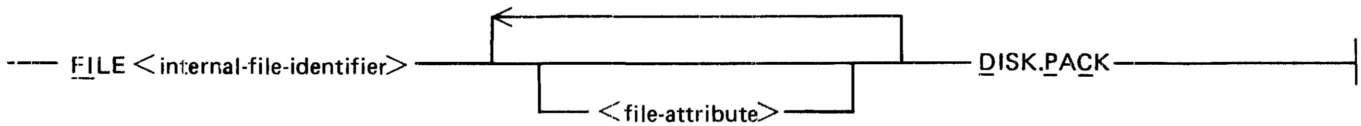
EXECUTE A/B; FILE MASTER DISK.FILE;

MODIFY PROG1; FILE INPUT DFL;

DISK.PACK

The DISK.PACK file attribute specifies that the file to be processed is located on a disk pack.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

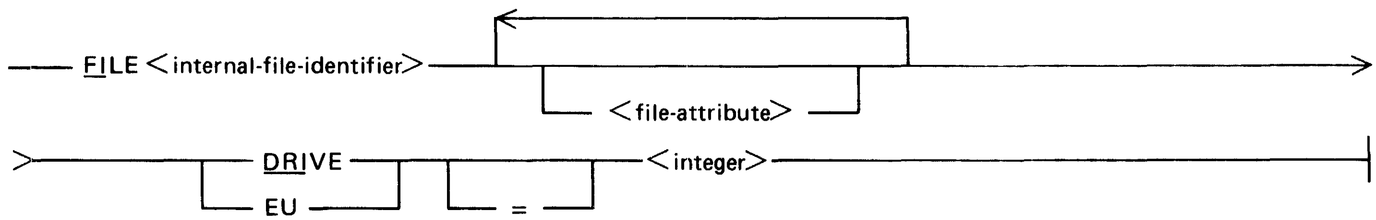
EXECUTE A/B; FILE MASTER DISK.PACK;

MODIFY PROG1; FILE INPUT DPC;

DRIVE

The DRIVE or EU file attribute causes the file to be directed to the disk drive specified by <integer>. The disk drive must be a SYSTEM disk.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 0 to 15 inclusive, and specifies the drive number to which the file is directed.

Examples:

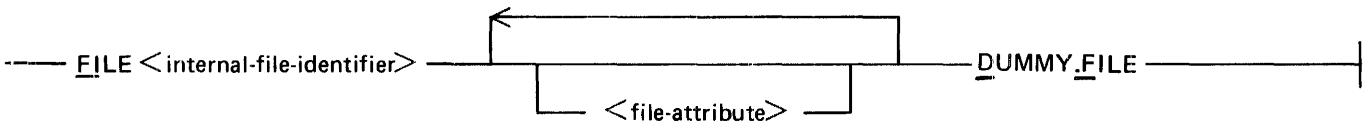
EXECUTE A/B; FILE MASTER DRIVE = 0;

MODIFY PROG1; FILE PAYROLL DRI 3;

DUMMY.FILE

The DUMMY.FILE file attribute causes the MCP to ignore any read or write operations for the file. A minimum File Information Block (FIB) is built with zero as the hardware type, and no buffers or input/output (I/O) descriptors are allocated. Upon performing an output operation to a dummy file, a program is reinstated with no data transfer or physical I/O taking place. The same is true for an input operation, unless the program specifies an end of file branch. In this case, the EOF branch is taken, the same as with a non-present optional file. Dummy files are particularly useful as debug files, or for cases in which the output of a program is not needed.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

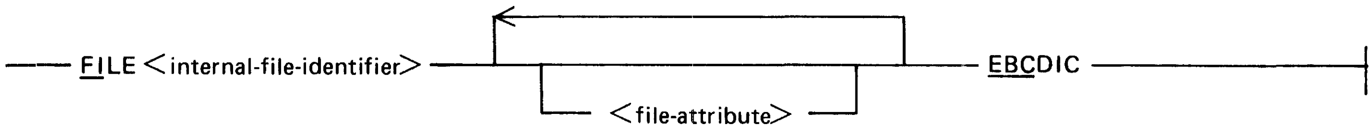
EXECUTE A/B; FILE DEBUGFILE DUMMY.FILE;

MODIFY PROG1; FILE ERRORS D.F;

EBCDIC

The EBCDIC file attribute causes the recording mode for the file to be the Extended Binary Coded Decimal Interchange Code (EBCDIC) recording mode.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

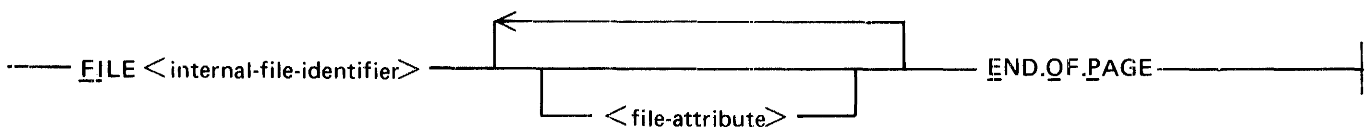
Examples:

    EXECUTE A/B; FILE MASTER EBCDIC;
    MODIFY PROG1; FILE PAYROLL EBC;

END.OF.PAGE

The END.OF.PAGE file attribute causes the MCP to report the end of page to the program after sensing a channel 12 punch on a line printer file.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

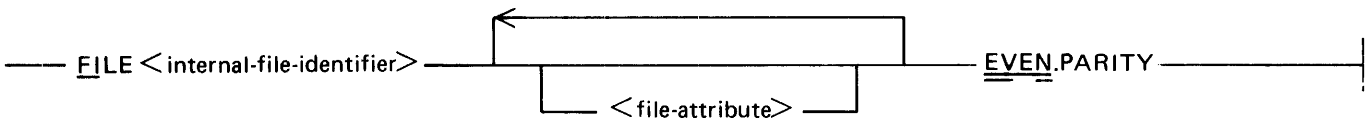
EXECUTE A/B; FILE LINE END.OF.PAGE;

MODIFY PROG1; FILE LINE EOP;

EVEN.PARITY

The EVEN.PARITY file attribute causes the MCP to use even parity-checking for the file. This attribute is only applicable for tape files.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

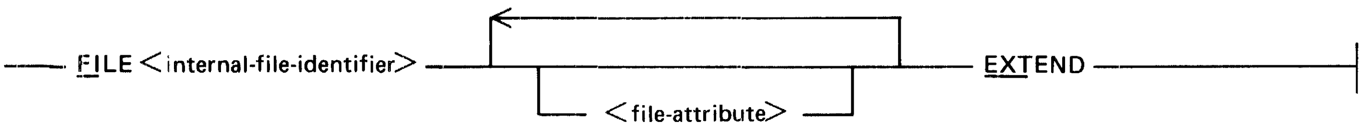
EXECUTE A/B; FILE MASTER EVEN.PARITY;

MODIFY PROG1; FILE PAYROLL EVEN;

EXTEND

The EXTEND file attribute applies to serial disk files that are opened with INPUT and OUTPUT and allows records to be added to the end of the file. The access characteristics of input/output (I/O) sequential files are also affected by the EXTEND file attribute. Refer to appendix C for a complete description of the sequential file access mechanism.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

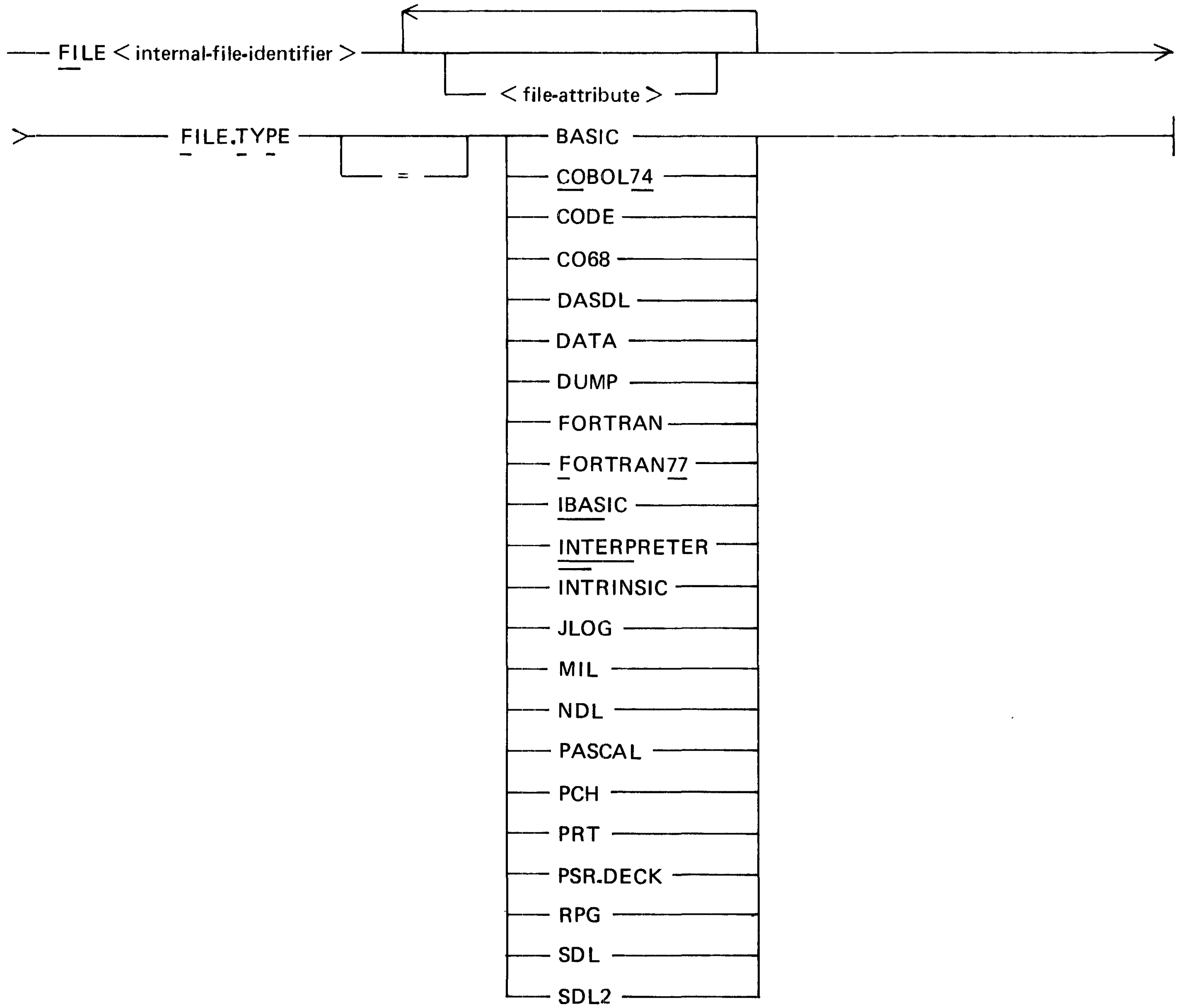
EXECUTE A/B; FILE MASTER EXTEND;

MODFIY PROG1; FILE PAYROLL EXT;

FILE.TYPE

The FILE.TYPE file attribute assigns a specific file type to an output disk file when it is closed and entered in the disk directory.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

BASIC
The BASIC keyword causes the file to be marked as a BASIC source file.

COBOL74
The COBOL74 keyword causes the file to be marked as a COBOL74 source file.

CODE
The CODE keyword causes the file type to be an object code file that can be executed on the B 1000 system.

CO68
The CO68 keyword causes the file to be marked as a CO68 source file.

DASDL
The DASDL keyword causes the file to be marked as a DASDL source file.

DATA
The DATA keyword causes the file to be marked as a data file.

DUMP
The DUMP keyword causes the file to be marked as a DUMP file.

FORTRAN
The FORTRAN keyword causes the file to be marked as a FORTRAN source file.

FORTRAN77
The FORTRAN77 keyword causes the file to be marked as a FORTRAN77 source file.

IBASIC
The IBASIC keyword causes the file to be marked as a IBASIC source file.

INTERPRETER
The INTERPRETER keyword causes the file to be marked as an interpreter file.

INTRINSIC
The INTRINSIC keyword causes the file to be marked as an intrinsic file. .G

JLOG
The JLOG keyword causes the file to be marked as a WFL joblog file.

MIL
The MIL keyword causes the file to be marked as a MIL source file.

NDL
The NDL keyword causes the file to be marked as a NDL source file.

PASCAL
The PASCAL keyword causes the file to be marked as a PASCAL source file.

PCH
The PCH keyword causes the file to be marked as a punch backup file.

PRT

The PRT keyword causes the file to be marked as a printer backup file.

PSR.DECK

The PSR.DECK keyword causes the file type to be a psuedo-reader file read by the SYSTEM/LDCONTRL program using the LD system command described in section 5.

RPG

The RPG keyword causes the file to be marked as a RPG source file.

SDL

The SDL keyword causes the file to be marked as a SDL source file.

SDL2

The SDL2 keyword causes the file to be marked as a SDL2 source file.

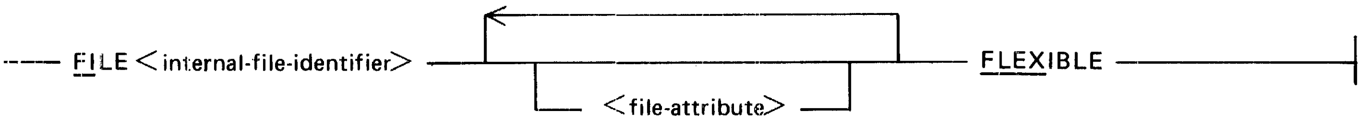
Examples:

```
EXECUTE A/B; FILE MASTER FILE.TYPE DATA;

MODIFY PROG1; FILE TESTCODE FTP CODE;
```

FLEXIBLE

The FLEXIBLE file attribute allows the specified value of the AREAS file attribute to be exceeded, up to the system limit of 105 areas. The FLEXIBLE file attribute applies only to disk files and can be changed only when the file is closed. This attribute does not work for ISAM files.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

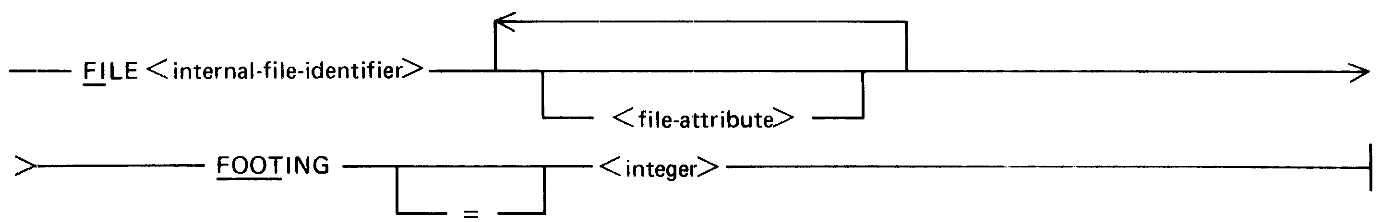
EXECUTE A/B; FILE OUTPUT FLEXIBLE;

MODIFY PROG1; FILE DISK FLEX;

FOOTING

The FOOTING file attribute specifies the number of lines from the beginning of the page body to the line where the MCP begins to report an end-of-page condition to the program. When this condition occurs, the ON EOF branch of the program is taken, but the record is still written, unless the record is written in the lower margin, in which case a page advance is made to the beginning of the next logical page.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<integer>
This field can contain any integer in the range 1 to 255 inclusive, and specifies the number of lines from the beginning of the page body to the line where the MCP begins to report an end-of-page condition.

Examples:

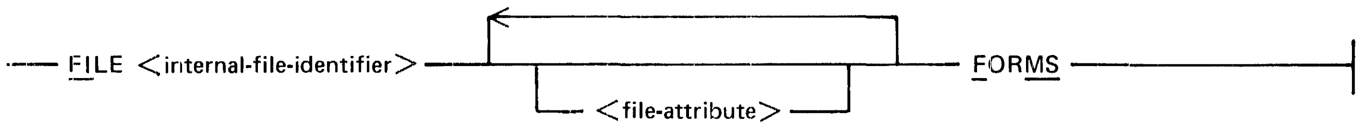
EXECUTE A/B; FILE PRINT FOOTING = 50;

MODIFY PROG1; FILE CHECKS FOOT 10;

FORMS

The FORMS file attribute causes the program to be suspended and causes the MCP to display a message requesting the operator to load special forms in a device (line printer or card punch) before the file is opened.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

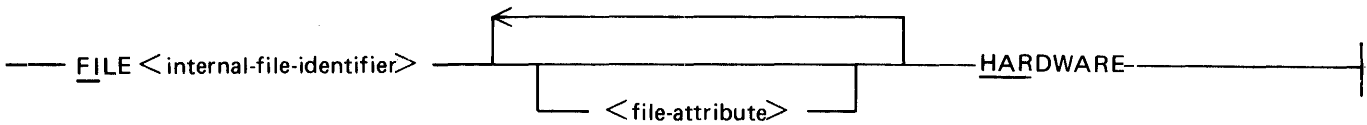
EXECUTE A/B; FILE LINE FORMS;

MODIFY PROG1; FILE CHECKS FMS;

HARDWARE

The HARDWARE file attribute causes a printer or punch file to go to the hardware device assigned. If both HARDWARE and one or more of the BACKUP attributes are set, the file goes to the hardware device, if available, unless the PBF (Printer Backup First) system option is set.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

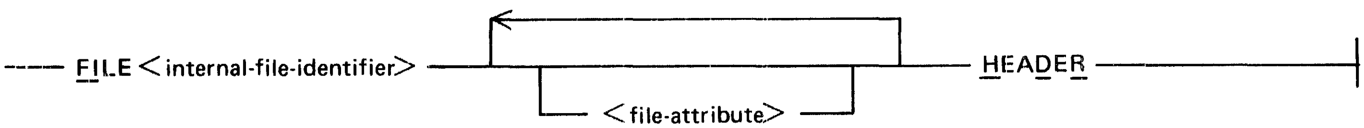
EXECUTE A/B; FILE LINE HARDWARE;

MODIFY PROG1; FILE PRINTER HAR;

HEADER

The HEADER file attribute applies to files with a device type of REMOTE and causes a 50-byte message header to be included in remote file read and write operations.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

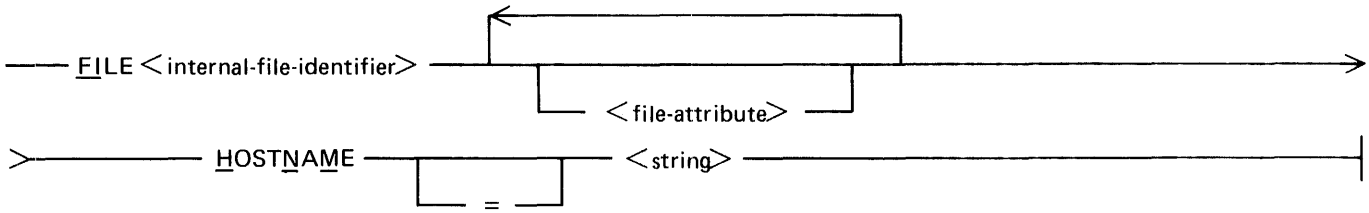
EXECUTE MCS; FILE REMOTE HEADER;

EXECUTE MCS; FILE MCSQUEUE HDR;

HOSTNAME

The HOSTNAME file attribute specifies a string that serves as the identifier of the host system where the file is to be located.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<string>
: This field can contain any 17-character string that specifies the name of the host system where the file is to be located.

Examples:

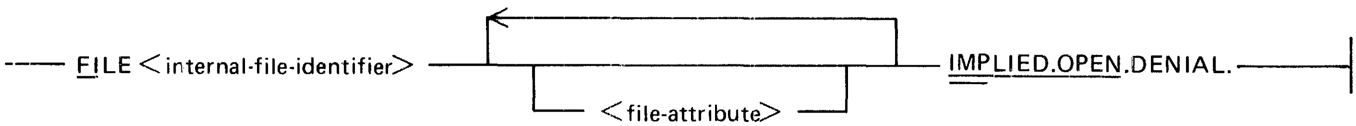
EXECUTE A/B; FILE MASTER HOSTNAME = B1000HOST;

MODIFY PROG1; FILE PAYROLL HNM A3HOST;

IMPLIED.OPEN.DENIAL

The IMPLIED.OPEN.DENIAL file attribute prevents the file from being opened implicitly. An implied open of a file occurs when a read or write operation is performed and the file was not explicitly opened.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

EXECUTE A/B; FILE MASTER IMPLIED.OPEN;

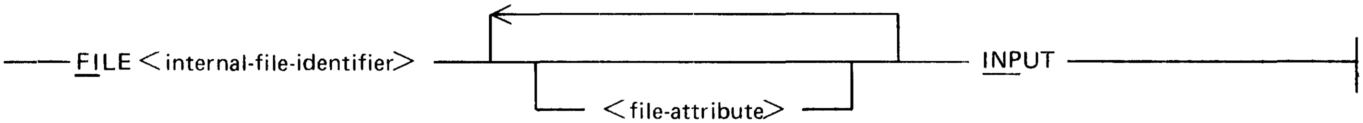
MODIFY PROG1; FILE PAYROLL NO IMP;

COMPILE COBOL74B/TESTO LIBRARY; FILE CARDS NAME COBOL74B/TEST IMPLIED.OPEN.DENIAL;

INPUT

The INPUT file attribute applies to files having an implied open. The INPUT file attribute sets the INPUT attribute and does not affect the settings of other implied open attributes. Implied open attributes are ignored by the MCP if the file is explicitly opened.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

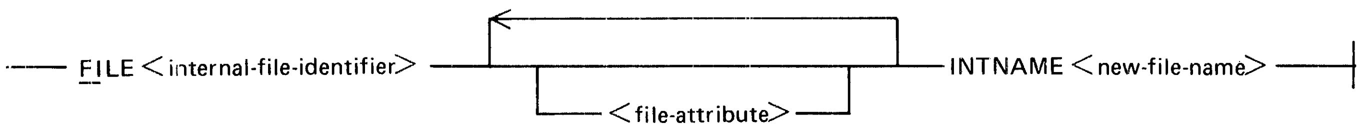
EXECUTE A/B; FILE MASTER INPUT;

MODIFY PROG1; FILE PAYROLL INP;

INTNAME

The INTNAME file attribute is used to modify the internal file name of a file. It can only be used with the MODIFY program control instruction.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<new-file-name>
: This field can contain any valid internal file identifier and specifies the new file name for the file.

Examples:

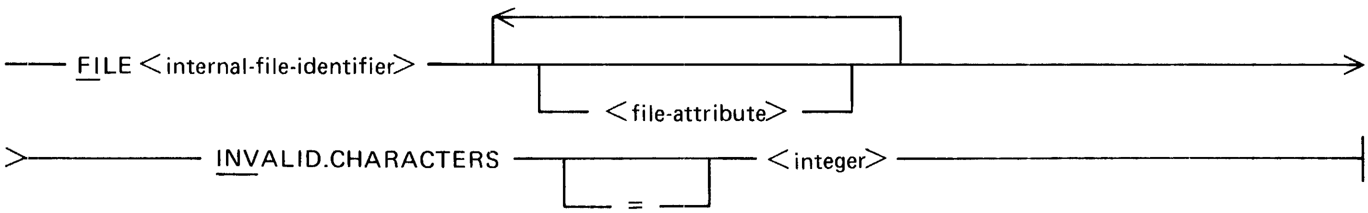
MODIFY A/B; FILE PRINT INTNAME LINE;

MO PROG1; FILE FILE3 INTNAME PAYROLL

INVALID.CHARACTERS

The INVALID.CHARACTERS file attribute determines the course of action taken if an invalid character is written to a train line printer.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<integer>
This field can contain any integer in the range 0 to 3 inclusive, and specifies the course of action taken if an invalid character is written to a train line printer.

If the value of <integer> is zero or one, all lines that contain invalid characters are reported. The following ODT message is displayed for each line with an invalid character.

FILE <file-name> IS PRINTING INVALID CHARACTERS ON LPx

<file-name> is the name of the printer file and the lower-case letter x is the unit mnemonic character for the line printer device.

If the value of <integer> is 2, the first occurrence of an invalid character printing on the line printer is reported and any additional invalid characters are not reported. The following ODT message is displayed when the first invalid character is reported.

FILE <file-name> IS PRINTING INVALID CHARACTER ON LPx (ONE TIME WARNING)

<file-name> is the name of the printer file and the lower-case letter x is the unit mnemonic character for the line printer device.

If the value of <integer> is 3, no invalid-character reporting is performed.

Examples:

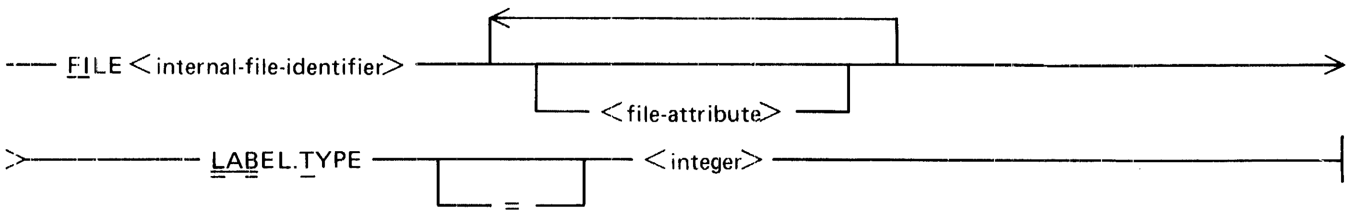
EXECUTE A/B; FILE PRINTER INVALID.CHARACTERS = 2;

MODIFY PROG1; FILE LINE INV 0;

LABEL.TYPE

The LABEL.TYPE file attribute specifies which label type to use or to expect for the file.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 0 to 2 inclusive, and specifies the type of label to use or expect for the file.

  If the value of <integer> is 0, the American National Standard Institute (ANSI) label is used or expected.

  If the value of <integer> is 1, the file is unlabeled.

  If the value of <integer> is 2, the Burroughs standard label is used or expected.

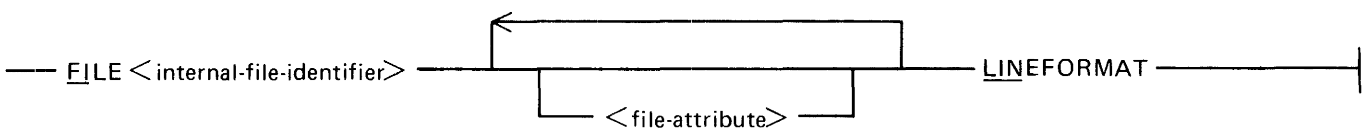
Examples:

```
EXECUTE A/B; FILE LINE LABEL.TYPE = 1;
MODIFY PROG1; FILE TAPE LAB 0;
EXECUTE TEST; FILE OUTPUT LBT = 1;
```

LINEFORMAT

The LINEFORMAT file attribute causes the values set for the FOOTING, LOWER.MARGIN, PAGE.SIZE, and UPPER.MARGIN file attributes to be used for printer files. Specifying NOT LINEFORMAT causes the FOOTING, LOWER.MARGIN, PAGE.SIZE, and UPPER.MARGIN file attributes to be ignored when printing.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

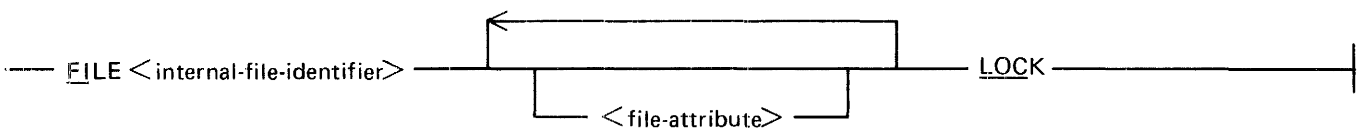
EXECUTE A/B; FILE PRINT LINEFORMAT;

MODIFY PROG1; FILE CHECKS NO LIN;

LOCK

The LOCK file attribute causes a disk file to be locked in the disk directory if the file is still open when the program goes to end of job or the program is discontinued with the DS or DP system commands described in Section 5. This file attribute applies only to new files.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

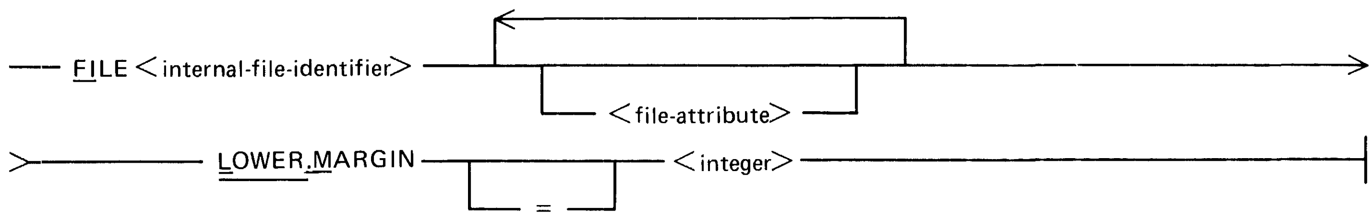
EXECUTE A/B; FILE MASTER LOCK;

MODIFY PROG1; FILE DISK LOC;

LOWER.MARGIN

The LOWER.MARGIN file attribute specifies the number of lines to leave blank between the page body and the bottom of the form.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<integer>
This field can contain any integer in the range 0 to 255 inclusive, and specifies the number of lines to leave blank between the page body and the bottom of the form.

Examples:

EXECUTE A/B; FILE PRINT LOWER.MARGIN = 6;

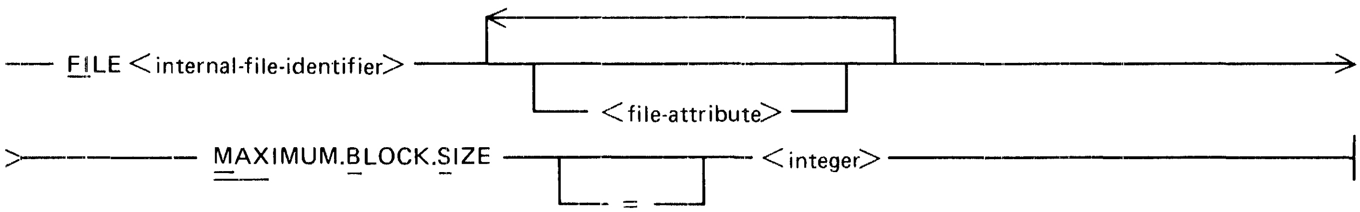
MODIFY PROG1; FILE CHECKS L.M 3;

EXECUTE TEST; FILE OUTPUT LOWER;

MAXIMUM.BLOCK.SIZE

The MAXIMUM.BLOCK.SIZE file attribute specifies the largest block size to be used for variable-length records.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<integer>
This field can contain any valid integer in the range 1 to 16,777,215 inclusive, and specifies the maximum number of bits for the block size to be used for variable-length records.

Examples:

EXECUTE A/B; FILE MASTER MAXIMUM.BLOCK.SIZE = 1800;

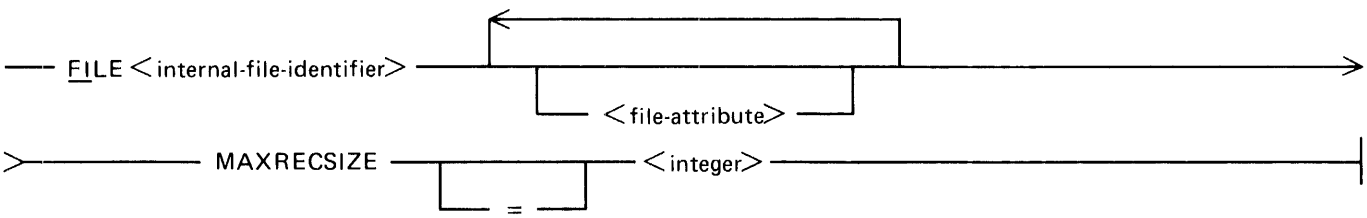
MODIFY PROG1; FILE DISK MAX 2000;

EXECUTE TEST; FILE TRANS MBS = 900;

MAXRECSIZE

The MAXRECSIZE file attribute specifies the maximum record size in bits for variable-length record files. This file attribute is equivalent to the RECORD.SIZE.IN.BYTES file attribute.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<integer>
This field can contain any integer in the range 1 to 65535 inclusive, and specifies the maximum record size in bits for a variable-length record file.

Examples:

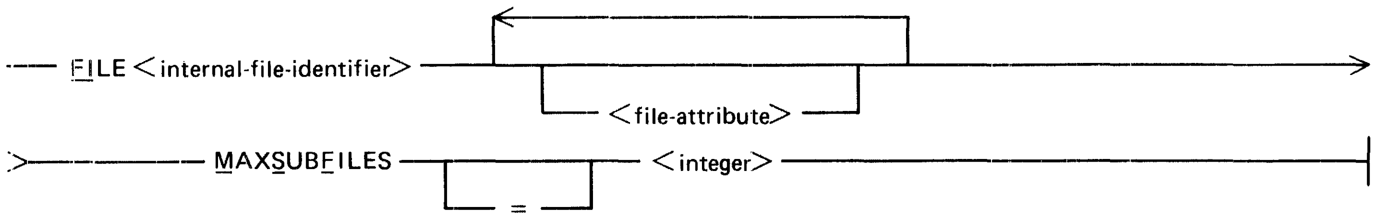
EXECUTE A/B; FILE VARFILE MAXRECSIZE = 1440;

MODIFY PROG1; FILE INPUT MAXRECSIZE 14400;

MAXSUBFILES

The MAXSUBFILES file attribute specifies the maximum number of subfiles in a file with a device type of PORT.FILE.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 1 to 255 inclusive, and specifies the maximum number of subfiles for the PORT file.

Examples:

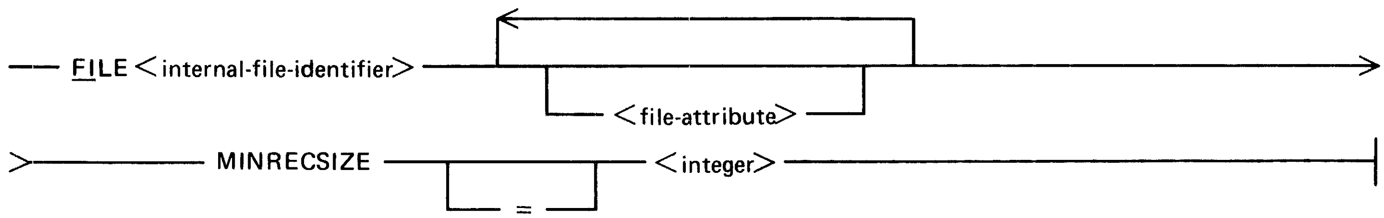
EXECUTE A/B; FILE PORTIO MAXSUBFILES = 10;

MODIFY PROG1; FILE PAYROLL MSF 5;

MINRECSIZE

The MINRECSIZE file attribute specifies the minimum record size in bits for variable-length record files.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 1 to 16,777,215 inclusive, and specifies the minimum record size in bits for the variable-length record file.

Examples:

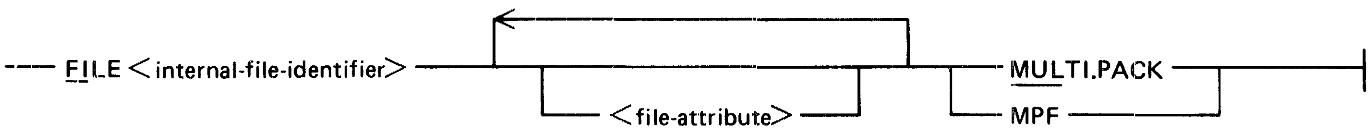
EXECUTE A/B; FILE IN MINRECSIZE = 1440;

MODIFY PROG1; FILE PAYROLL MINRECSIZE 14400;

MULTI.PACK

The MULTI.PACK file attribute allows the disk file to use more than one user disk.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

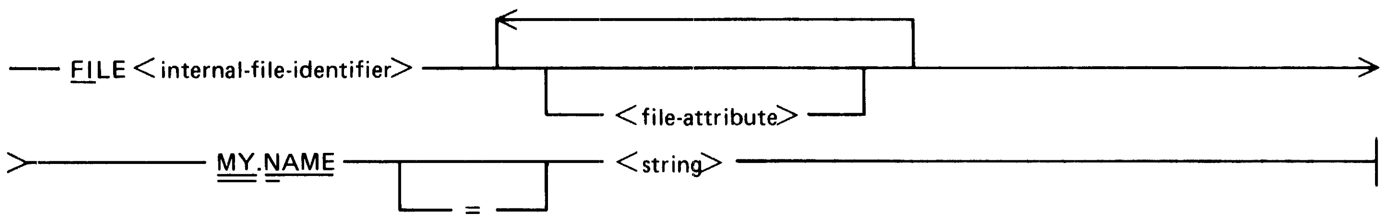
EXECUTE A/B; FILE MASTER MULTI.PACK;

MODIFY PROG1; FILE DISK MPF;

MY.NAME

The MY.NAME file attribute applies to files with a device type of PORT.FILE and specifies the identification by which the program opening the port file wishes to be known.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<string>
This field can contain any 17 characters and specifies the name by which the program opening the port file wishes to be known.

Examples:

EXECUTE A/B; FILE PORTIO MY.NAME = B1000HOST;

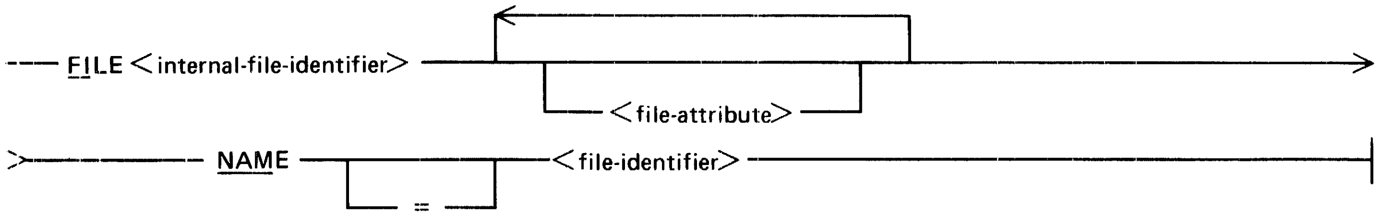
MODIFY PROG1; FILE PAYROLL MYN PAYROLLHST;

EXECUTE TEST; FILE PORTIN MYNAME = ACCTHOST;

NAME

The NAME file attribute causes the external file identifier or family name (disk identifier) to be changed to the value of <file-identifier>. If only the family name is to be changed, use the PACK.ID file attribute instead.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

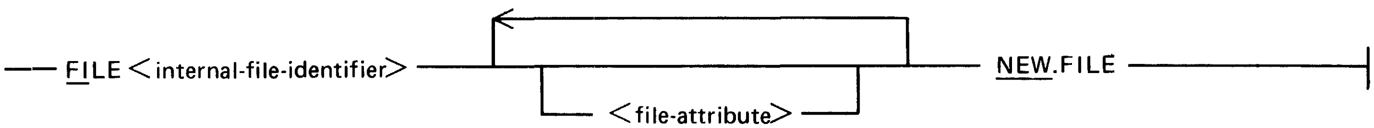
EXECUTE A/B; FILE MASTER NAME MASTERPACK/MASTER/FILE;

MODIFY PROG1; FILE DISK NAM PROG1/DISKFILE;

NEW.FILE

The NEW.FILE file attribute causes a new file to be opened, whether or not a file of the same name already exists in the disk directory, and does not affect the setting of the other implied open attributes. It applies to implied opens of a disk file. An implied open of a file occurs when the program performs a read or write operation on a file and the program did not perform an open operation. The implied open attributes are ignored if the file is explicitly opened.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

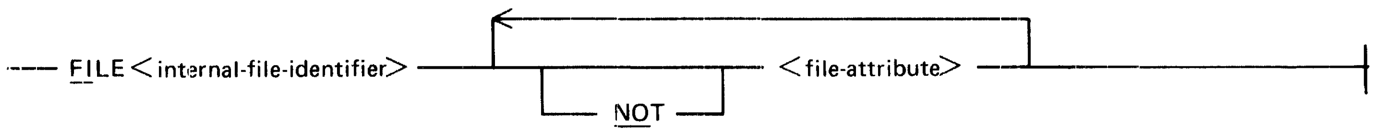
EXECUTE A/B; FILE MASTER NEW.FILE;

MODIFY PROG1; FILE LINE NEW;

NOT

The NOT file attribute negates the immediately following file attribute. For example, a file assigned to go only to backup could be changed to go to the line printer by specifying NO BACKUP in the FILE program control instruction.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any of the following file attributes and specifies the file attribute to negate.

ALLOCATE.AT.OPEN	NEW.FILE
AUTOPRINT	OPEN.LOCK
BACKUP	OPEN.LOCKOUT
BACKUP.DISK	OPTIONAL
BACKUP.TAPE	OUTPUT
DEFAULT	PSEUDO
DUMMY.FILE	REVERSE
END.OF.PAGE	REWIND
EXTEND	SPECIAL.FORMS
HARDWARE	TRANSLATE
HEADER	USER.BACKUP.NAME
IMPLIED.OPEN	WITH.INTERPRET
INPUT	WITH.PRINT
LOCK	WITH.STACKERS
MULTI.PACK	WORK.FILE

Examples:

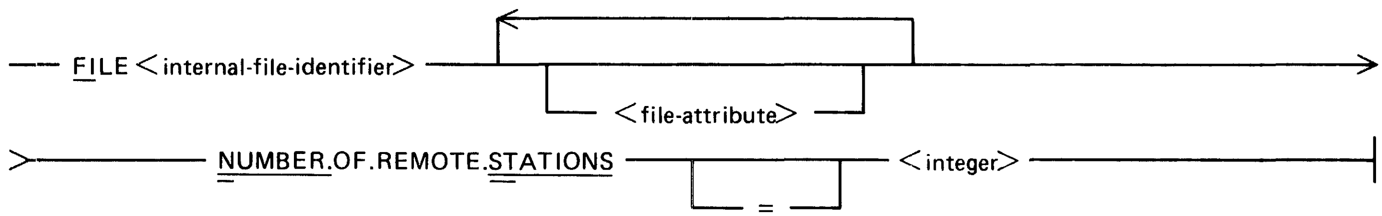
EXECUTE A/B; FILE LINE NOT HARDWARE;

MODIFY PROG1; FILE TAPE NO REWIND;

NUMBER.OF.REMOTE.STATIONS

The NUMBER.OF.REMOTE.STATIONS file attribute applies to files with a device type of REMOTE and specifies the maximum number of stations that can be attached to the file.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 0 to 999 inclusive, and specifies the maximum number of stations that can be attached to this remote file.

Examples:

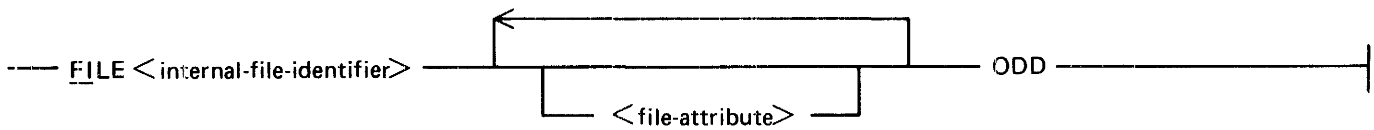
EXECUTE MCS; FILE REMOTE NUMBER.OF.REMOTE.STATIONS = 12;

EXECUTE PROG1; FILE MCSQUEUE NST 2;

ODD

The ODD file attribute causes the MCP to use odd parity checking for this file. This attribute is applicable to magnetic tape files only.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

EXECUTE A/B; FILE MASTER ODD;

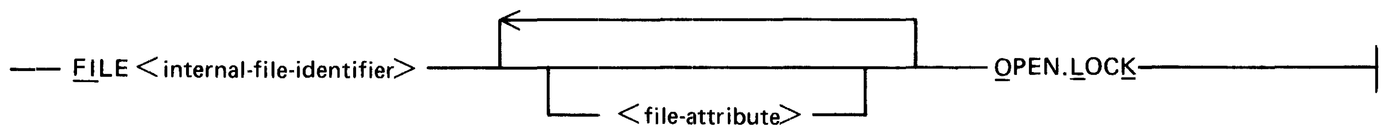
MODIFY PROG1; FILE TAPE ODD;

OPEN.LOCK

The OPEN.LOCK file attribute sets the LOCK attribute when the file is opened implicitly. An implied file open occurs when a program performs a read or write operation on a file without explicitly opening the file. If the file is explicitly opened, then the implied open attributes are ignored.

The OPEN.LOCK attribute gives a program the ability to prevent other programs from writing to the file while the first program has the file open. Other programs are not prevented from reading the file while the first program has the file open.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

EXECUTE A/B; FILE MASTER OPEN.LOCK;

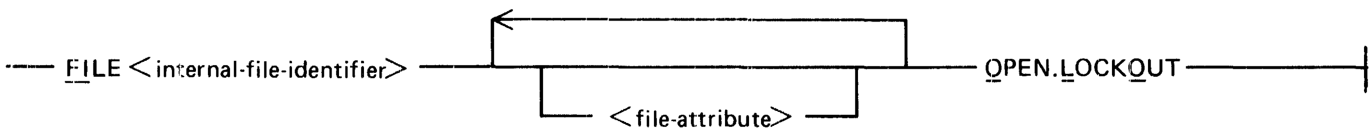
MODIFY PROG1; FILE DISK OLK;

OPEN.LOCKOUT

The OPEN.LOCKOUT file attribute sets the LOCKOUT attribute when the file is opened implicitly. An implied file open occurs when a program performs a read or write operation to a file without explicitly opening the file. If the file is explicitly opened, then the implied open attributes are ignored.

The OPEN.LOCKOUT file attribute prevents other programs from accessing the file while the first program has the file open. The first program that opens the file with the OPEN.LOCKOUT file attribute set has exclusive use of the file.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the target file for the <file-attribute>.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

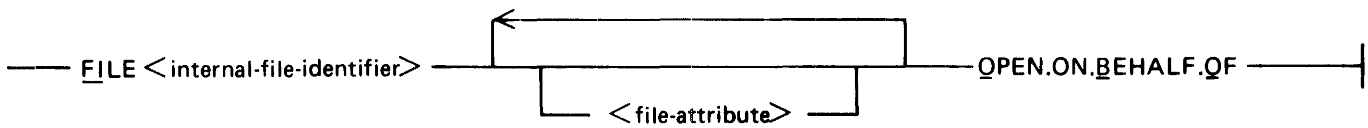
EXECUTE A/B; FILE MASTER OPEN.LOCKOUT;

MODIFY PROG1; FILE DISK OLO;

OPEN.ON.BEHALF.OF

The OPEN.ON.BEHALF.OF file attribute causes the security restrictions associated with the usercode/password of the task to not be applied to the file. The OPEN.ON.BEHALF.OF file attribute can only be changed when the file is closed.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the target file for the <file-attribute>.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

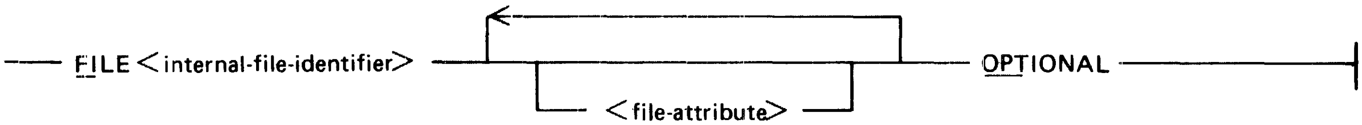
EXECUTE A/B; FILE MASTER OPEN.ON.BEHALF.OF;

MODIFY PROG1; FILE DISK OBO;

OPTIONAL

The OPTIONAL file attribute causes the file to be an optional file. An optional file need not be present; an end of file (EOF) report is given to the program after the operator responds to the "NO FILE" situation with an OF system command, provided the program has requested the report. If no report was requested, the program is discontinued.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

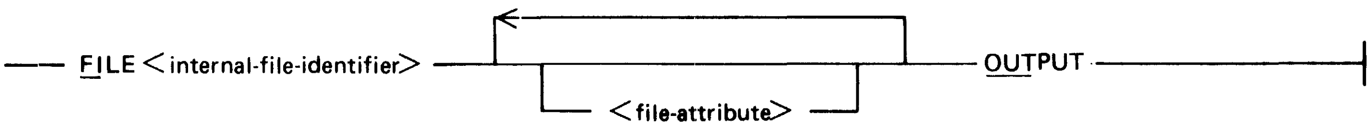
EXECUTE A/B; FILE DEBUG OPTIONAL;

MODIFY PROG1; FILE TEST OPT;

OUTPUT

The OUTPUT file attribute sets the OUTPUT attribute for a file opened implicitly. An implied open of a file occurs when a program performs a write operation to a file and an open operation was not performed. If the file is opened explicitly, then the implied open attributes are ignored.

Syntax:



Semantics:

<internal-file-identifier>
    This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
    This field can contain any valid file attribute described in this section.

Examples:

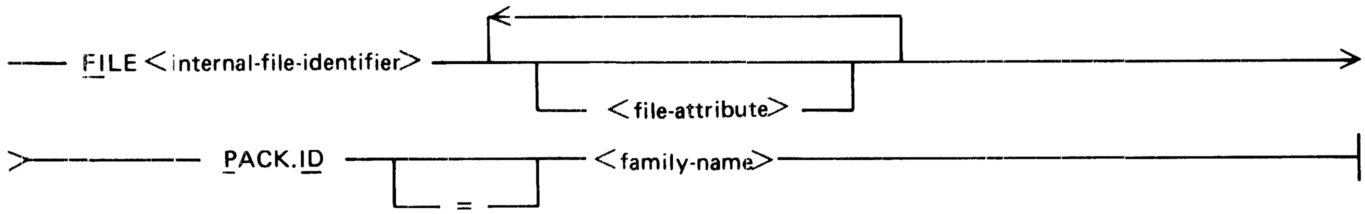
    EXECUTE A/B; FILE LINE OUTPUT;

    MODIFY PROG1; FILE TAPE OUT;

PACK.ID

The PACK.ID file attribute assigns a disk identifier to the file. A subsequent NAME or TITLE file attribute overrides the value assigned to the disk identifier.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<family-name>
: This field can contain any 10-character disk identifier that is valid on the B 1000 system.

Examples:

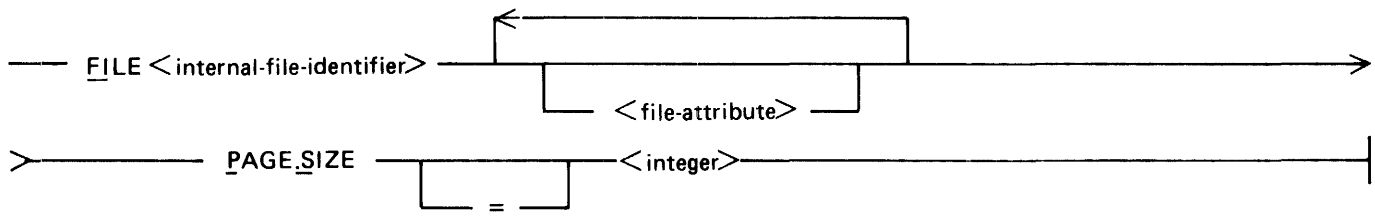
EXECUTE A/B; FILE MASTER PACK.ID = USER;

MODIFY PROG1; FILE PAYROLL PID FINANCE;

PAGE.SIZE

The PAGE.SIZE file attribute specifies the number of lines between the lower and upper margins of a printed form. The lower margin is specified with the LOWER.MARGIN file attribute and the upper margin is specified with the UPPER.MARGIN file attribute.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 0 to 255 inclusive, and specifies the number of lines between the lower and upper margins of a printed form.

Examples:

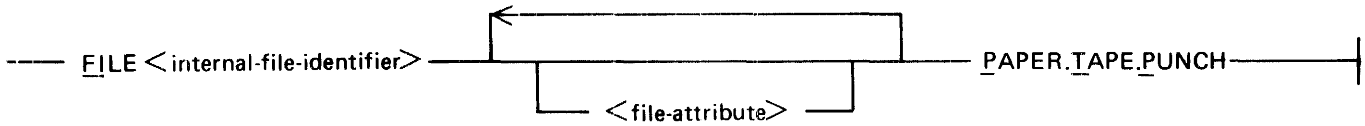
EXECUTE A/B; FILE FORMS PAGE.SIZE = 30;

MODIFY PROG1; FILE CHECKS P.S 20;

PAPER.TAPE.PUNCH

The PAPER.TAPE.PUNCH file attribute specifies that output is to be directed to a paper-tape-punch device.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

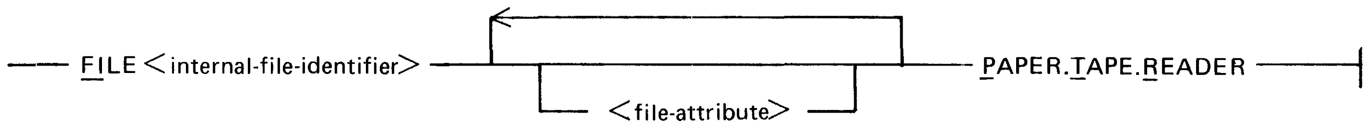
EXECUTE A/B; FILE MASTER PAPER.TAPE.PUNCH;

MODIFY PROG1; FILE OUTPUT PTP;

PAPER.TAPE.READER

The PAPER.TAPE.READER file attribute specifies that input is from a paper-tape-reader device.

Syntax:



Semantics:

<internal-file-identifier>
    This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
    This field can contain any valid file attribute described in this section.

Examples:

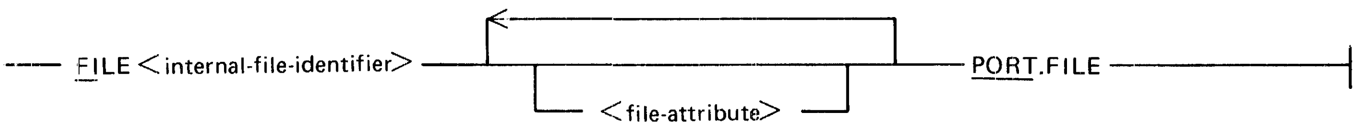
    EXECUTE A/B; FILE MASTER PAPER.TAPE.READER;

    MODIFY PROG1; FILE OUTPUT PTR;

PORT.FILE

The PORT.FILE file attribute specifies that the device for the file is to be of type PORT.

Syntax:



Semantics:

<internal-file-identifier>
    This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
    This field can contain any valid file attribute described in this section.

Examples:

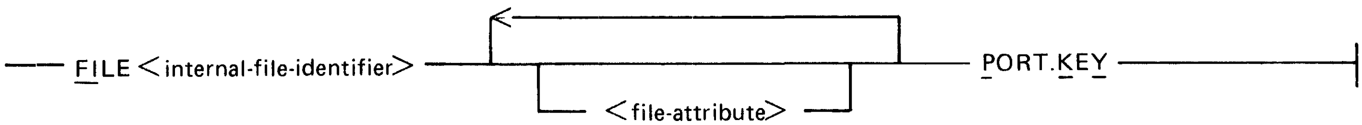
    EXECUTE A/B; FILE PORTIO PORT.FILE;

    MODIFY PROG1; FILE PAYPORT PORT;

PORT.KEY

The PORT.KEY file attribute specifies that the port file has keys (subport indexes) used in the read and write operations.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

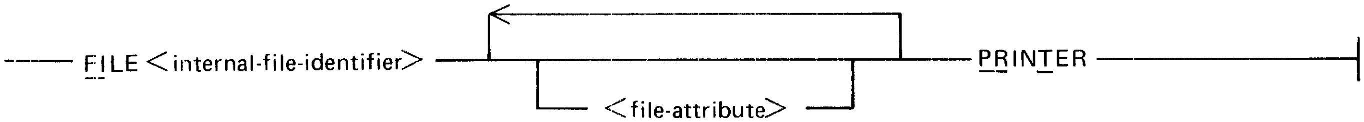
EXECUTE A/B; FILE PORTIO PORT.KEY;

MODIFY PROG1; FILE PAYPORT PKY;

PRINTER

The PRINTER file attribute specifies that the output file is to be sent to an available printer.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

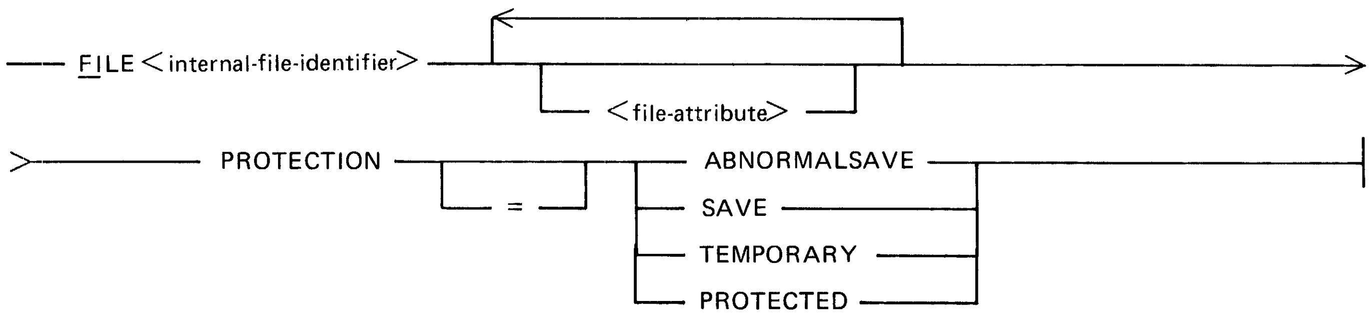
EXECUTE A/B; FILE OUTPUT PRINTER;

MODIFY PROG1; FILE OUTFILE PRT;

PROTECTION

The PROTECTION file attribute specifies additional protection for disk files in cases where the program is discontinued with the DS or DP system commands described in Section 5. This file attribute applies only to new files.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

ABNORMALSAVE
The ABNORMALSAVE keyword causes the disk file to be entered in the disk directory if the program that opened this file is discontinued with a DS or DP system command.

SAVE
The SAVE keyword causes the disk file to be entered in the disk directory as soon as the file is opened.

TEMPORARY
The TEMPORARY keyword causes a new disk file to be discarded when the program is discontinued with a DS or DP system command, unless the disk file has been explicitly closed.

PROTECTED
The PROTECTED keyword provides protection from loss of data from the file in the event of a system halt or program failure. See Appendix C of this manual for a complete description of the effects of PROTECTION = PROTECTED.

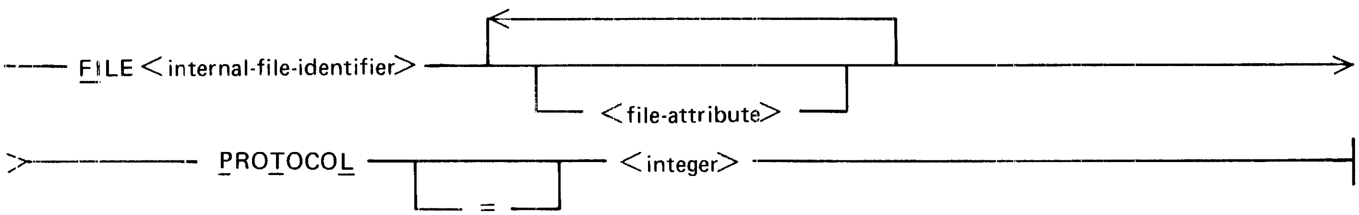
Examples:

```
EXECUTE A/B; FILE MASTER PROTECTION = ABNORMALSAVE;
MODIFY PROG1; FILE PAYROLL PROTECTION SAVE;
```

PROTOCOL

The PROTOCOL file attribute applies only to files with device type of REMOTE and specifies the protocol number that is placed into the OPEN (type 10) message passed to a Message Control System (MCS) when the remote file is opened. Refer to the B 1000 Systems Network Definition Language (NDL) Language Manual for a complete description of the OPEN message. The PROTOCOL file attribute can be used for any desired purpose to communicate a value to an MCS at remote-file open time; for example, to define a specific communication protocol.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 0 to 99 inclusive, and specifies the protocol value to be placed in the open message passed to an MCS when the remote file is opened.

Examples:

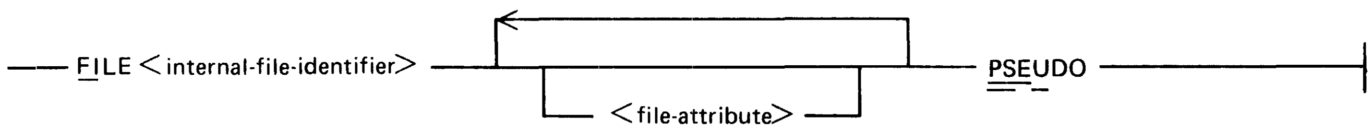
EXECUTE MCS; FILE REMOTE PROTOCOL = 10;

MODIFY PROG1; FILE MCSQUEUE PTL 2;

PSEUDO

The PSEUDO file attribute designates the file to have a PSEUDO READER disk file type.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

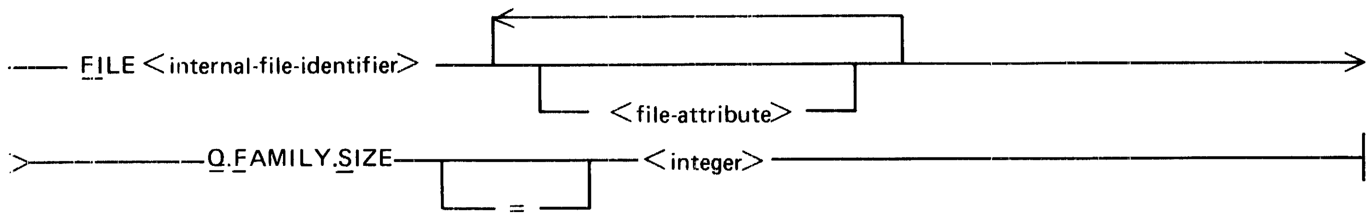
EXECUTE A/B; FILE OUT PSEUDO;

MODIFY PROG1; FILE PSEUDOFILE PSU;

Q.FAMILY.SIZE

The Q.FAMILY.SIZE file attribute applies only to files with a device type equal to QUEUE and specifies the number of subqueues in the file.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 0 to 999 inclusive, and specifies the number of subqueues in the queue-file first for this file.

Examples:

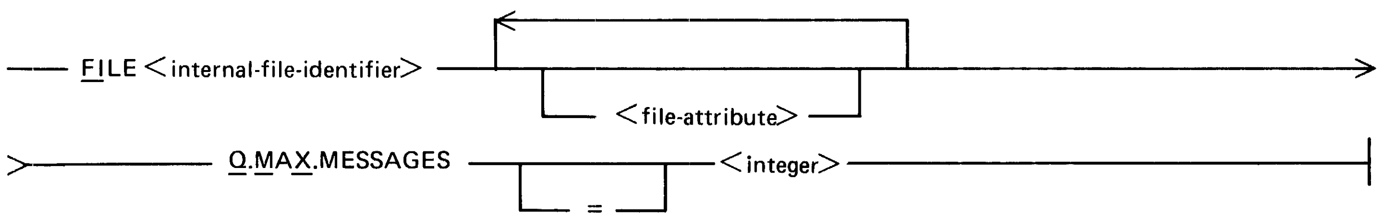
EXECUTE A/B; FILE MCSQUEUE Q.FAMILY.SIZE = 10;

MODIFY PROG1; FILE Q QFS 3;

Q.MAX.MESSAGES

The Q.MAX.MESSAGES file attribute applies to files with device types of QUEUE or REMOTE. For queue files, the Q.MAX.MESSAGES file attribute specifies the maximum number of messages that can be in the queue at any one time. For remote files, the Q.MAX.MESSAGES file attribute specifies the maximum number of messages that can be in the input queue. The size of output queue for remote files is declared by the network controller.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 0 to 1023 inclusive, and specifies the maximum number of messages that can be in the queue at any one time.

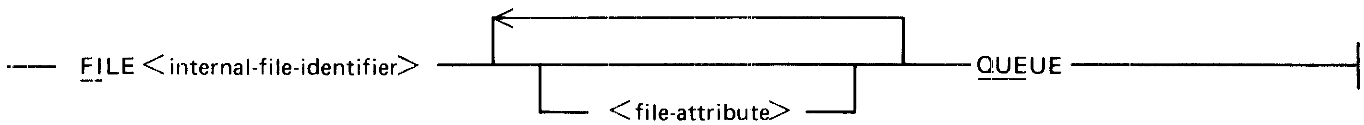
Examples:

```
EXECUTE A/B; FILE QUEUE Q.MAX.MESSAGES = 255;
MODIFY PROG1; FILE REMOTE QMX 20;
```

QUEUE

The QUEUE file attribute identifies the file as a queue file.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

NOTE
Queue files cannot be file equated to reside on any disk other than the system disk.

Examples:

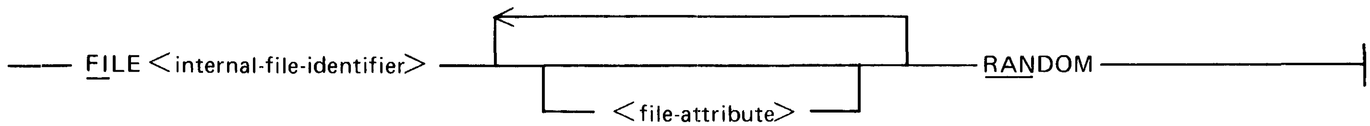
EXECUTE A/B; FILE MASTER QUEUE;

MODIFY PROG1; FILE QFILE QUE;

RANDOM

The RANDOM file attribute causes the access mode for the file to be random.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

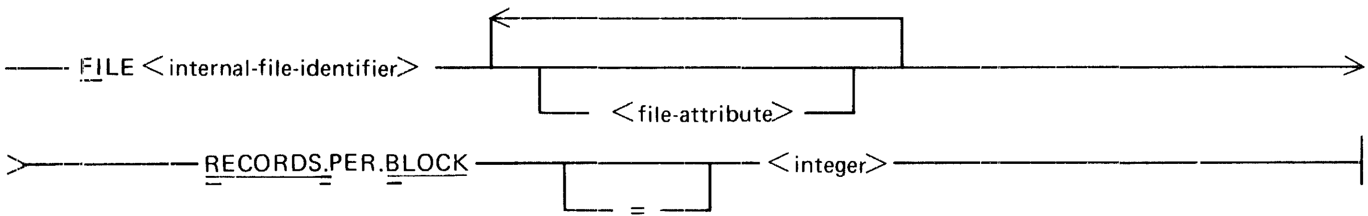
Examples:

    EXECUTE A/B; FILE MASTER RANDOM;
    MODIFY PROG1; FILE DISK RAN;

RECORDS.PER.BLOCK

The RECORDS.PER.BLOCK file attribute specifies the number of logical records assigned per block for a fixed-length record file.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<integer>
This field can contain any integer in the range 1 to 16,777,215 inclusive, and specifies the number of fixed-length records contained in each block.

Examples:

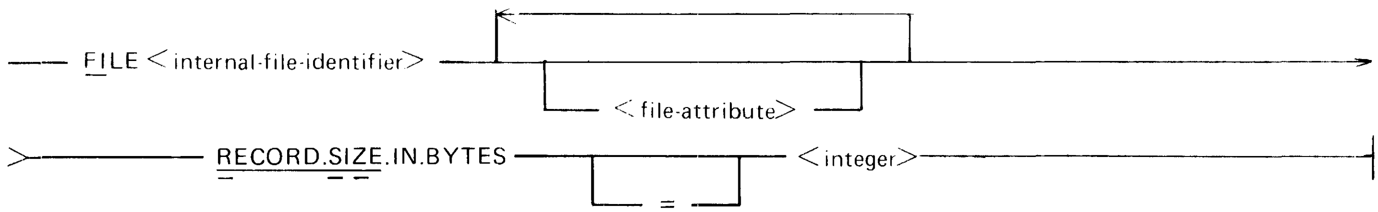
EXECUTE A/B; FILE MASTER RECORDS.PER.BLOCK = 10;

MODIFY PROG1; FILE DISK R.B 20;

RECORD.SIZE.IN.BYTES

The RECORD.SIZE.IN.BYTES file attribute assigns the number of bytes for each logical record in the file.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 0 to 16,777,215 inclusive, and specifies the number of bytes for each logical record in the file.

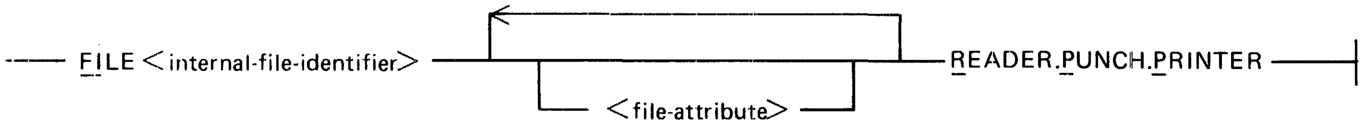
Examples:

```
EXECUTE A/B; FILE MASTER RECORD.SIZE.IN.BYTES = 180;
MODIFY PROG1; FILE PAYROLL RSZ 90;
```

READER.PUNCH.PRINTER

The READER.PUNCH.PRINTER file attribute assigns an input or output file to a card reader/punch device.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

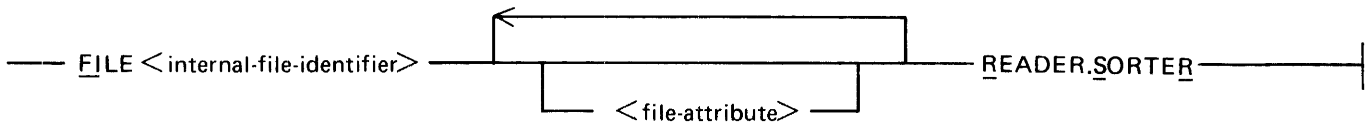
EXECUTE A/B; FILE MASTER READER.PUNCH.PRINTER;

MODIFY PROG1; FILE INPUT RPP;

READER.SORTER

The READER.SORTER file attribute assigns an input file to the reader-sorter device.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

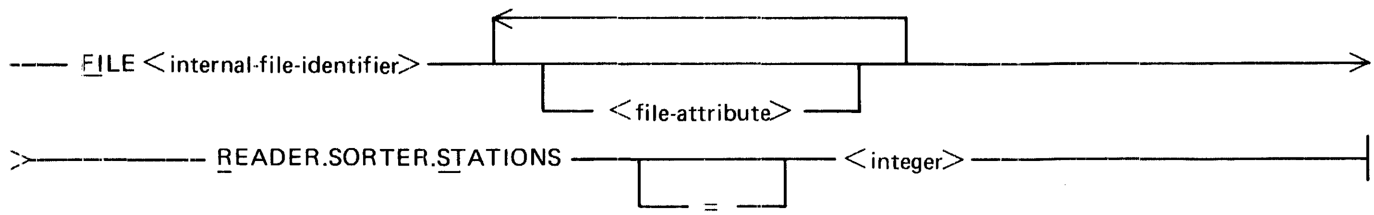
EXECUTE A/B; FILE MASTER READER.SORTER;

MODIFY PROG1; FILE INPUT RSR;

READER.SORTER.STATIONS

The READER.SORTER.STATIONS file attribute specifies the number of read heads on a reader-sorter device.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<integer>
This field can contain any integer in the range 1 to 3 inclusive, and specifies the number of read heads on the reader-sorter device.

Examples:

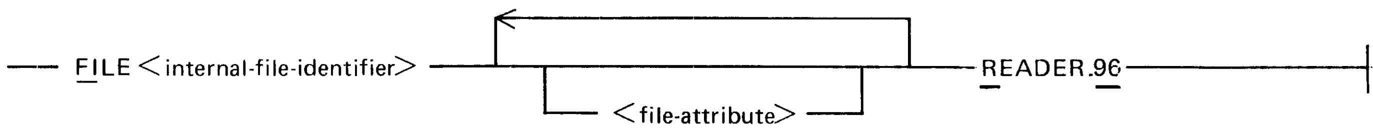
EXECUTE A/B; FILE SORTER READER.SORTER.STATIONS = 2;

MODIFY PROG1; FILE CHECKS RST 1;

READER.96

The READER.96 file attribute specifies that input to the file is from a 96-column card reader.

Syntax:



Semantics:

<internal-file-identifier>
    This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
    This field can contain any valid file attribute described in this section.

Examples:

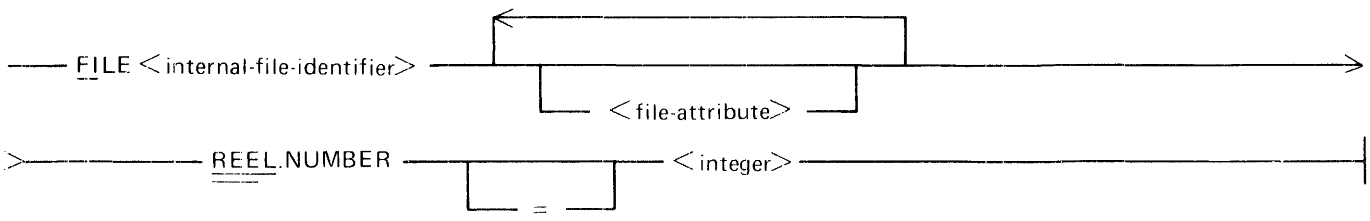
EXECUTE A/B; FILE MASTER READER.96;

MODIFY PROG1; FILE INPUT R96;

REEL.NUMBER

The REEL.NUMBER file attribute specifies the number of the first reel of a multireel tape file.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field determines the first reel number for a multireel tape file.

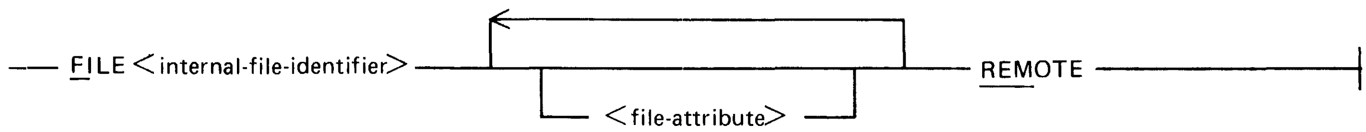
Examples:

```
EXECUTE A/B; FILE TAPEFILE REEL.NUMBER = 1;
MODIFY PROG1; FILE PAYROLL REEL 3;
```

REMOTE

The REMOTE file attribute defines a file as a remote file.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

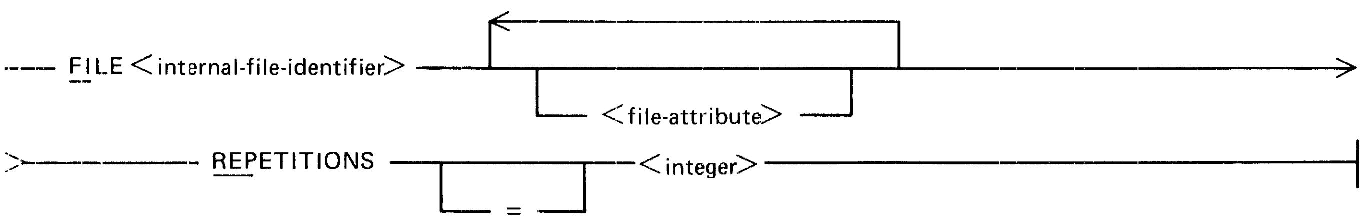
EXECUTE A/B; FILE MASTER REMOTE;

MODIFY PROG1; FILE INPUT REM;

REPETITIONS

The REPETITIONS file attribute specifies the number of copies of a backup file to be printed or punched by the SYSTEM/BACKUP program. The value of the REPETITIONS file attribute can be overridden by the COPIES option of the PB system command (described in Section 5) and is valid only at file creation time. If the REPETITIONS value for a printer or punch file is greater than 1, the file is automatically directed to backup by the MCP, unless explicitly prevented by specifying the NO BACKUP file attribute.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 1 to 63 inclusive, and specifies the number of copies of the file to be printed or punched.

Examples:

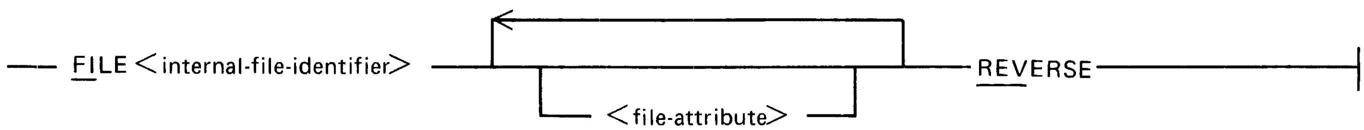
EXECUTE A/B; FILE PRINTER REPETITIONS = 3;

MODIFY PROG1; FILE CHECKS REP 2;

REVERSE

The REVERSE file attribute applies to tape files only and causes the tape file to be read or written in reverse. The REVERSE file attribute sets the REVERSE attribute for an implied open of a file. An implied open of a file occurs when a read or write operation is performed on a file that was not explicitly opened. Implied open attributes are ignored if the file is explicitly opened.

Syntax:



Semantics:

<internal-file-identifier>
  This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
  This field can contain any valid file attribute described in this section.

Examples:

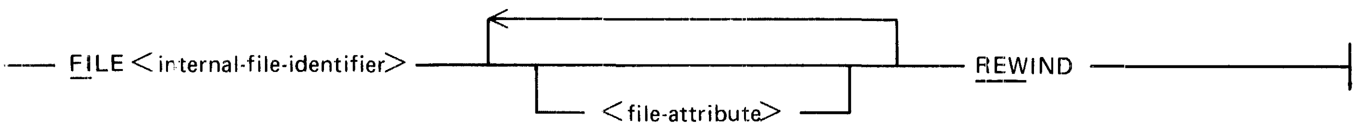
EXECUTE A/B; FILE TAPEFILE REVERSE;

MODIFY PROG1; FILE TAPE REV;

REWIND

The REWIND file attribute causes the tape file to be rewound when the file is opened and applies to a tape file that is implicitly opened. An implied open of a file occurs when a read or write operation is performed on a file that was not explicitly opened. If the file is not explicitly opened, then the implied open attributes are ignored.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

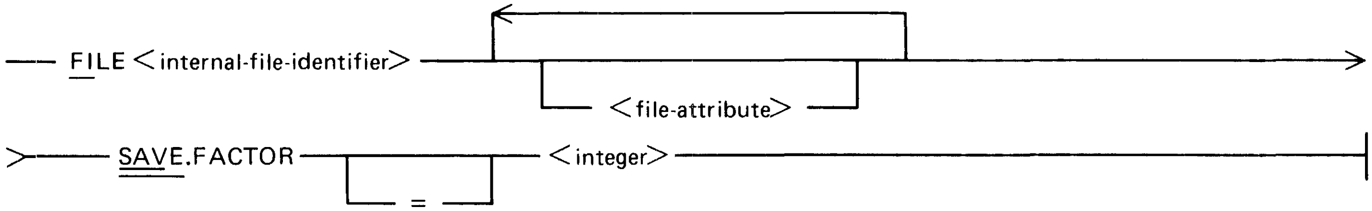
EXECUTE A/B; FILE TAPEFILE REWIND;

MODIFY PROG1; FILE TAPE NO REW;

SAVE.FACTOR

The SAVE.FACTOR file attribute specifies the number of days a tape or disk file can be saved. This file attribute is of visual value only.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<integer>
This field specifies the number of days to be added to the file creation date to determine the last day for the file to be saved.

Examples:

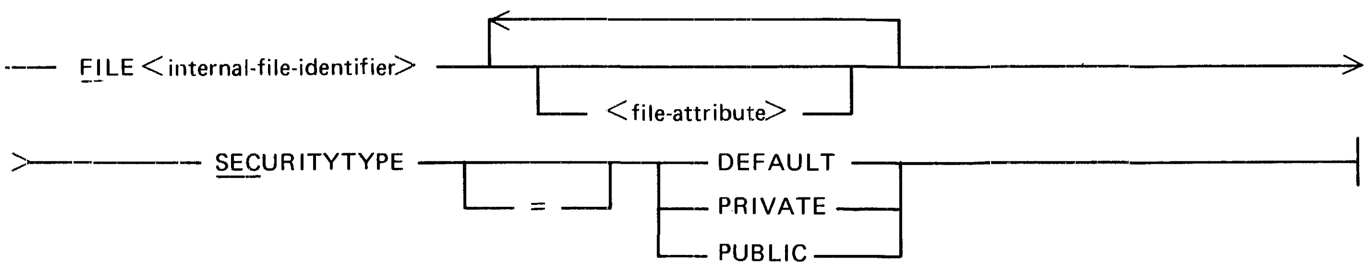
EXECUTE A/B; FILE MASTER SAVE.FACTOR = 30;

MODFIY PROG1; FILE PAYROLL SAV 10;

SECURITYTYPE

The SECURITYTYPE file attribute designates the type of security for a disk file. A new disk file is given the security type specified by the File Parameter Block (FPB) when it is closed and entered in the disk directory.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

DEFAULT
: The DEFAULT keyword causes the file to use the default security type.

PRIVATE
: The PRIVATE keyword causes the file to be a private file. Only processes with a privileged usercode or a usercode equivalent to the multifile identifier (MFID) of the file can access this file.

PUBLIC
: The PUBLIC keyword causes the file to be a public file and can be accessed by any process.

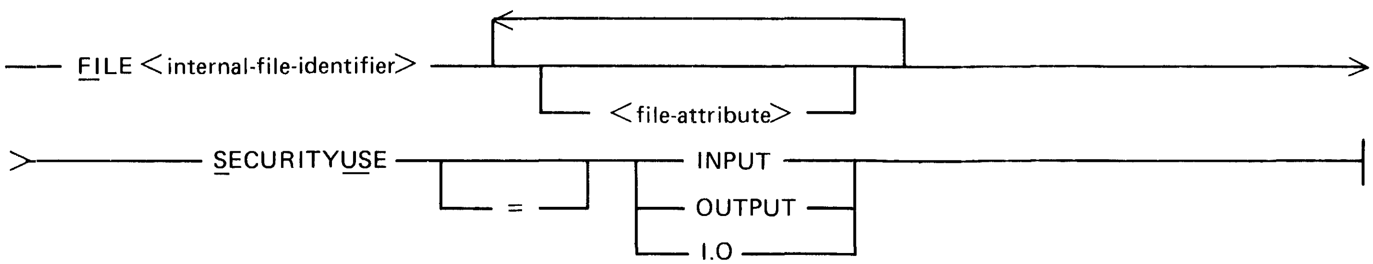
Examples:

```
EXECUTE A/B; FILE MASTER SECURITYTYPE = PRIVATE;
MODIFY PROG1; FILE PAYROLL SEC DEFAULT;
```

SECURITYUSE

The SECURITYUSE file attribute designates the type of input/output (I/O) allowed for the file. A new disk file is given the security I/O code specified by the File Parameter Block (FPB) when it is closed and entered in the disk directory.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

INPUT
: The INPUT keyword causes the security I/O to be input only.

OUTPUT
: The OUTPUT keyword causes the security I/O to be output only.

I.O
: The I.O keysymbol causes the security I/O to be input and output.

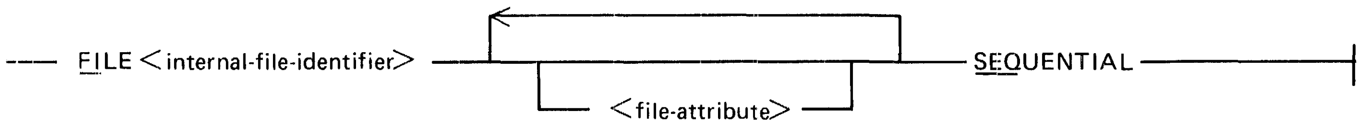
Examples:

```
EXECUTE A/B; FILE MASTER SECURITYUSE = INPUT;
MODIFY PROG1; FILE PAYROLL SUS OUTPUT;
```

SEQUENTIAL

The SEQUENTIAL file attribute specifies that the file access mode is sequential.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

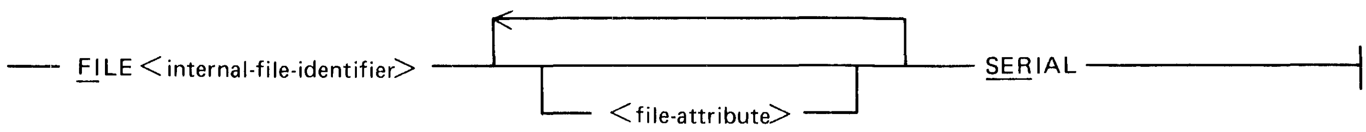
EXECUTE A/B; FILE MASTER SEQUENTIAL;

MODIFY PROG1; FILE INPUT SEQ;

SERIAL

The SERIAL file attribute specifies that the file is to be processed serially.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

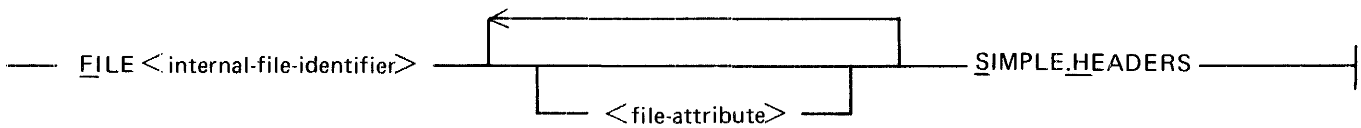
EXECUTE A/B; FILE MASTER SERIAL;

MODIFY PROG1; FILE PAYROLL SER;

SIMPLE.HEADERS

The SIMPLE.HEADERS file attribute causes the remote file to use the 50-byte NDL message header as an extended remote key, but to have no Message Control System (MCS) control functions. Refer to the B 1000 Systems Network Definition Language (NDL) Language Manual for a complete description of the functions of a remote file with simple headers.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

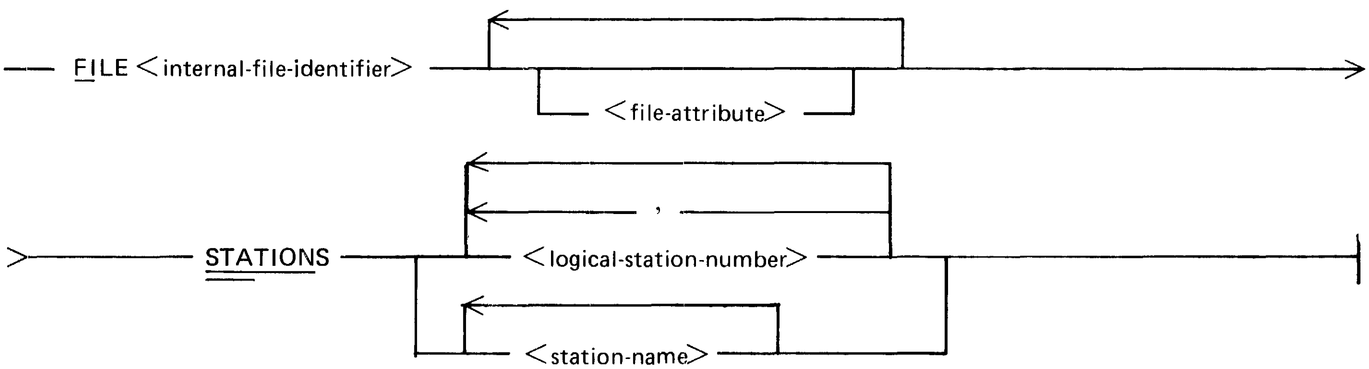
EXECUTE A/B; FILE MCSQUEUE SIMPLE.HEADERS;

MODIFY PROG1; FILE RMTEFILE S.H;

STATIONS

The STATIONS file attribute applies to files with a device type of REMOTE and specifies the stations to be attached to this remote file at program-execution time. The STATIONS file attribute is not valid for the MODIFY program control instruction.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<logical-station-number>
: This field can contain any logical station number (LSN) that is declared in the network controller and specifies the LSN that is attached to the remote file of the program at execution time. A maximum of 999 logical station numbers can be specified with the STATIONS file attribute.

<station-name>
: This field can contain any valid station name that is declared in the network controller and specifies the station that is attached to the remote file of the program at execution time. A maximum of 299 station names can be specified with the STATIONS file attribute.

Examples:

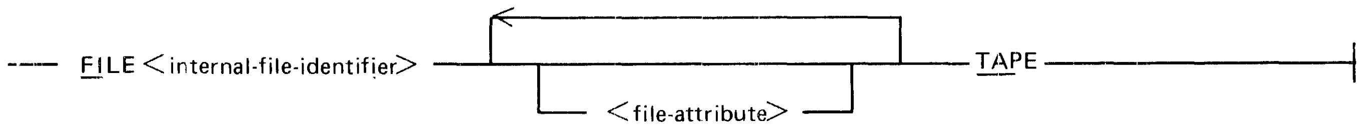
EXECUTE A/B; FILE RMTE STATIONS MT01, ET02, TD03;

EXECUTE PROG1; FILE MCSQUEUE STA 1 5 7 9;

TAPE

The TAPE file attribute specifies that the output file is to be written to a tape device. The TAPE file attribute is the most general of the tape device file attributes.

Syntax:



Semantics:

<internal-file-identifier>
    This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
    This field can contain any valid file attribute described in this section.

Examples:

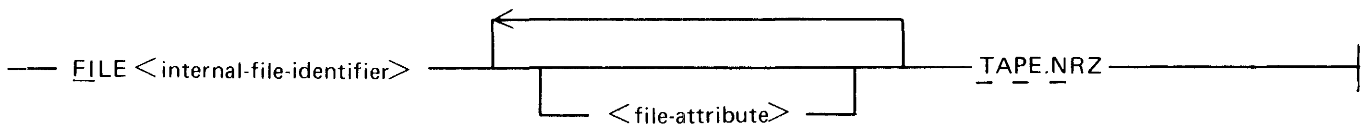
    EXECUTE A/B; FILE TAPEFILE TAPE;

    MODIFY PROG1; FILE PAYROLL TAP;

TAPE.NRZ

The TAPE.NRZ file attribute specifies that the output file is to be written to a tape device using Non-Return-to-Zero (NRZ) tape mode only.

Syntax:



Semantics:

<internal-file-identifier>
    This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
    This field can contain any valid file attribute described in this section.

Examples:

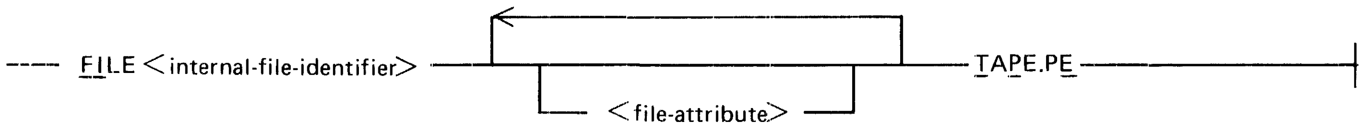
    EXECUTE A/B; FILE TAPEFILE TAPE.NRZ;

    MODIFY PROG1; FILE PAYROLL TPN;

TAPE.PE

The TAPE.PE file attribute specifies that the output file is written to a tape device using Phase-Encoded (PE) tape mode only. Records for TAPE.PE files must be of an even size because PE tapes use even size blocks.

Syntax:



Semantics:

<internal-file-identifier>
This field contains any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field contains any valid file attribute described in this section.

Examples:

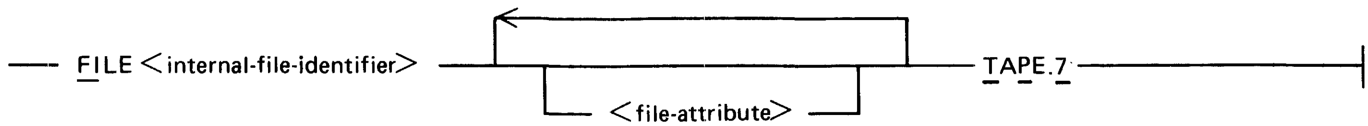
EXECUTE A/B; FILE TAPEFILE TAPE.PE;

MODIFY PROG1; FILE PAYROLL TPE;

TAPE.7

The TAPE.7 file attribute specifies that the output file is to be written to a tape device using 7-track tape mode only.

Syntax:



Semantics:

<internal-file-identifier>
  This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
  This field can contain any valid file attribute described in this section.

Examples:

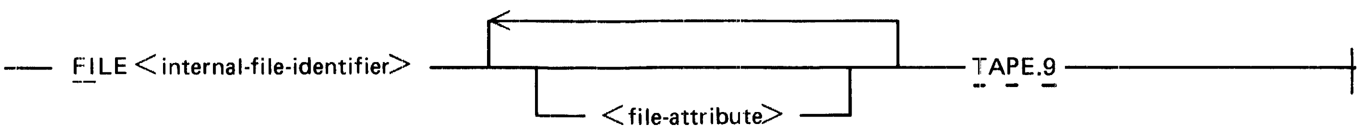
  EXECUTE A/B; FILE TAPEFILE TAPE.7;

  MODIFY PROG1; FILE PAYROLL TP7;

TAPE.9

The TAPE.9 file attribute specifies that the output file is to be written to a tape device using 9-track tape mode only.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

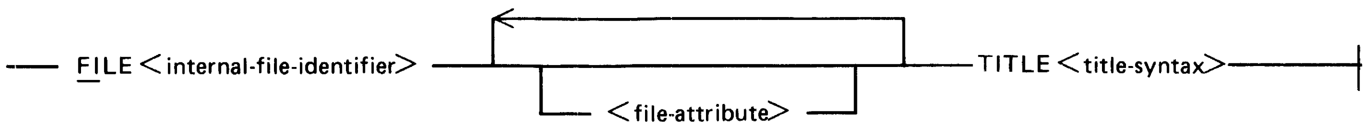
EXECUTE A/B; FILE TAPEFILE TAPE.9;

MODIFY PROG1; FILE PAYROLL TP9;

TITLE

The TITLE file attribute specifies the external name of a file using syntax of the form B/C ON A, where B is the name of the first part of the file name, C is the name of the second part of the file name, and A is the family name (or disk identifier).

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

<title-syntax>
This field refers to the external name of the file, using the form B/C on A.

Examples:

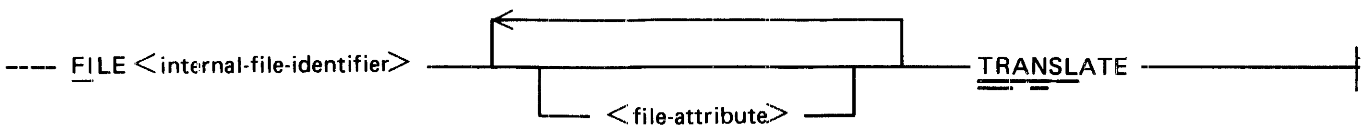
EXECUTE A/B; FILE MASTER TITLE MASTER/FILE ON PACKA;

MODIFY PROG1; FILE PAYROLL TITLE PROG1 ON TEST;

TRANSLATE

The TRANSLATE file attribute specifies that the file is to be translated using the MCP soft translate facility. Translation is not allowed on input/output files. The name of the translate file to be used must be specified by the TRANSLATE.FILE.NAME file attribute.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

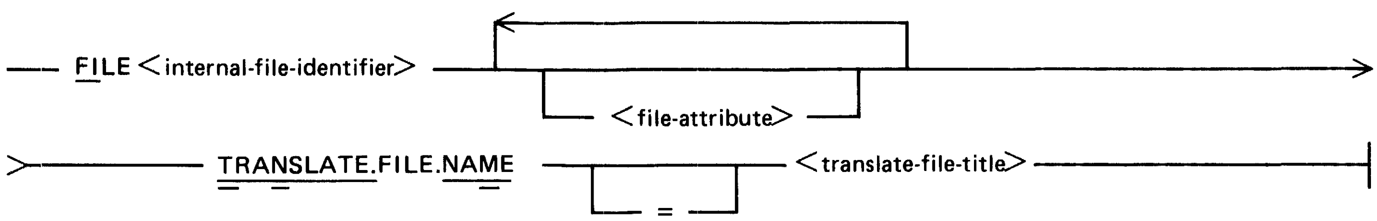
EXECUTE A/B; FILE PRINTER TRANSLATE;

MODIFY PROG1; FILE LINE TRN;

TRANSLATE.FILE.NAME

The TRANSLATE.FILE.NAME file attribute specifies the file name of the file to be used, if soft translate is requested. The first name portion of the file name is assumed to be TRANSLATE and is not specified with this file attribute. The translate file must have been created using the CREATE/TABLE program and must reside on the SYSTEM disk.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<translate-file-title>
: This field can contain any valid B 1000 file title and specifies the name of the translate file to be used.

Examples:

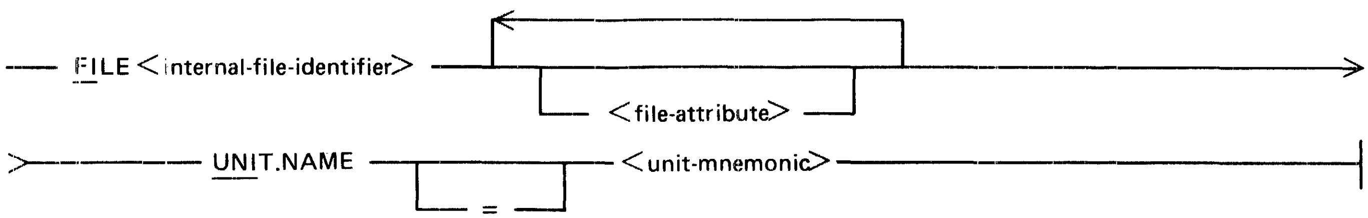
EXECUTE A/B; FILE PRINTER TRANSLATE.FILE.NAME = TRANSFILE;

MODIFY PROG1; FILE PAYROLL TNM PAYTRAN;

UNIT.NAME

The UNIT.NAME file attribute directs the file to the specified unit mnemonic. If a family name is specified for the file, then this file attribute is ignored. This file attribute does not apply to disk files. Use of the UNIT.NAME attribute eliminates the need for the operator to explicitly assign a device for the file with the UL system command.

Syntax:



Semantics:

<internal-file-identifier>
  This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
  This field can contain any valid file attribute described in this section.

<unit-mnemonic>
  This field can contain any valid B 1000 unit-mnemonic. Refer to Section 1 for a list of the valid unit mnemonics for the B 1000 system.

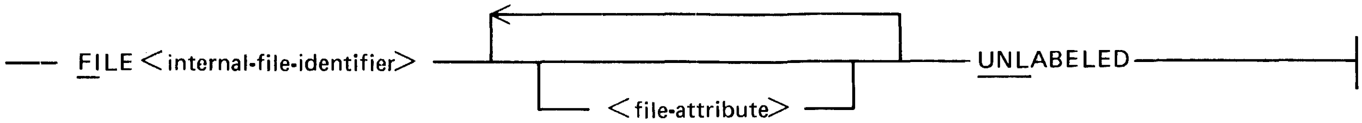
Examples:

```
EXECUTE A/B; FILE OUTPUT UNIT.NAME MTA;
MODIFY PROG1; FILE LINE UNI LPB;
```

UNLABELED

The UNLABELED file attribute specifies that there is no label on this file. Setting the UNLABELED file attribute is equivalent to specifying a LABEL.TYPE of 1.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

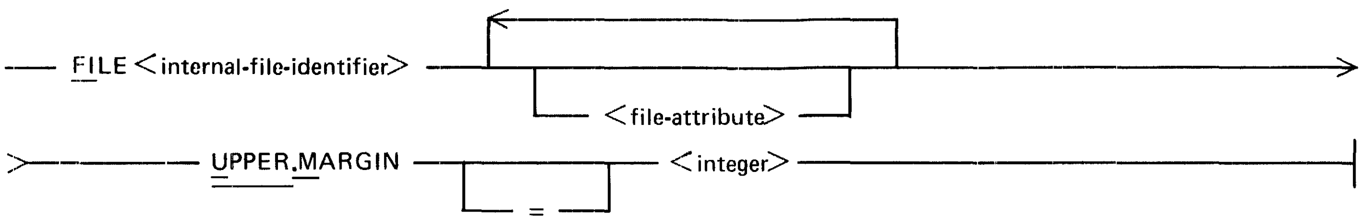
EXECUTE A/B; FILE LINE UNLABELED;

MODIFY PROG1; FILE INPUT UNL;

UPPER.MARGIN

The UPPER.MARGIN file attribute specifies the number of lines from the top of the form to the first print line.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

<integer>
: This field can contain any integer in the range 0 to 255 inclusive, and specifies the number of lines from the top of the form to the first print line for this line printer file.

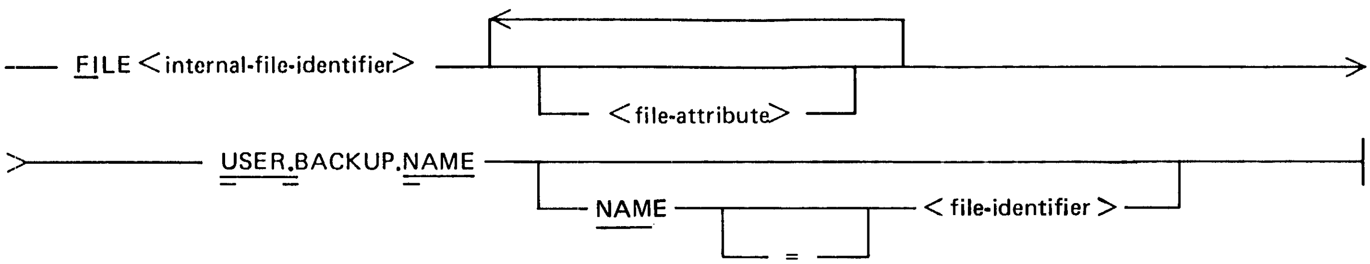
Examples:

```
EXECUTE A/B; FILE PRINT UPPER.MARGIN = 4;
MODIFY PROG1; FILE CHECKS U.M 2;
```

USER.BACKUP.NAME

The USER.BACKUP.NAME file attribute applies to disk, printer, and punch backup files and specifies the external file identifier to be used rather than the default backup file identifier of BACKUP/PRT<integer> or BACKUP/PCH<integer> when the file is entered in the disk directory. This file attribute is ignored for backup files sent to tape. The NAME file attribute must be specified to assign the alternate name for the backup file identifier. If the specified name has a blank familyname, the file is directed to the DL BACKUP designation; specifying the keyword DISK as the familyname causes the backup file to be directed to the system disk.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

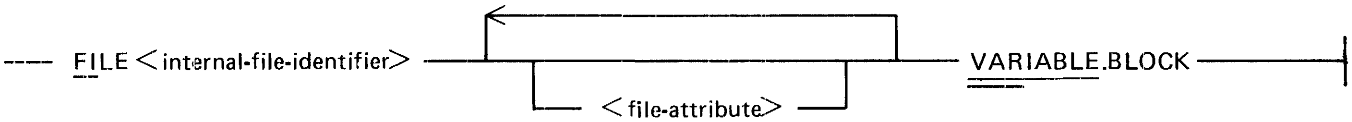
EXECUTE A/B; FILE LINE USER.BACKUP.NAME NAME A/#LINE

MODIFY PROG1; FILE CHECKS U.N NAM CHECKS;

VARIABLE.BLOCK

The VARIABLE.BLOCK file attribute causes the file to be processed using variable-length records.

Syntax:



Semantics:

<internal-file-identifier>
 This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
 This field can contain any valid file attribute described in this section.

Examples:

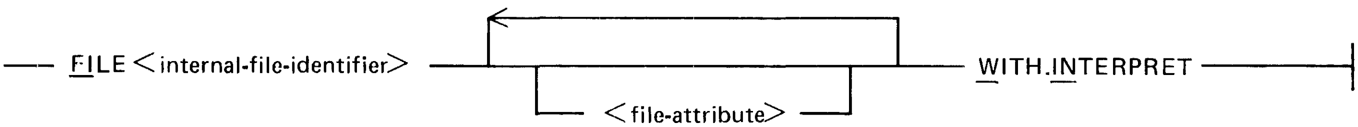
EXECUTE A/B; FILE MASTER VARIABLE.BLOCK;

MODIFY PROG1; FILE PAYROLL VAR;

WITH.INTERPRET

The WITH.INTERPRET file attribute applies to files that are opened implicitly, and sets the data recorder INTERPRET attribute. An implied open of a file occurs when a program performs a read or write operation on a file without explicity opening the file. Implied open attributes are ignored if the file is opened explicitly.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

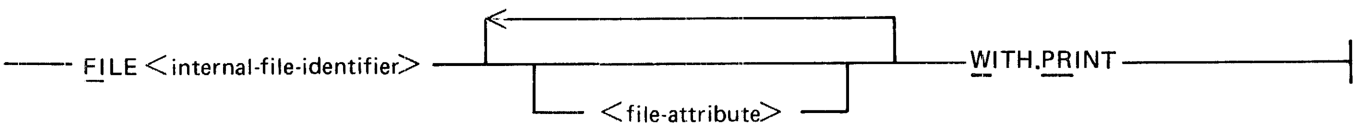
EXECUTE A/B; FILE PUNCHFILE WITH.INTERPRET;

MODIFY PROG1; FILE PAYPUNCH WIN;

WITH.PRINT

The WITH.PRINT file attribute applies to files that are opened implicitly, and sets the data recorder PRINT attribute. An implied open of a file occurs when a program performs a read or write operation on a file without explicitly opening the file. Implied open attributes are ignored if the file is opened explicitly.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

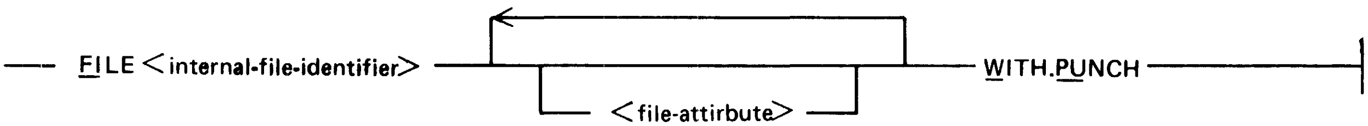
EXECUTE A/B; FILE PUNCHFILE WITH.PRINT;

MODIFY PROG1; FILE PAYPUNCH WPR;

WITH.PUNCH

The WITH.PUNCH file attribute applies to files that are opened implicitly, and sets the data recorder PUNCH attribute. An implied open of a file occurs when a program performs a read or write operation on a file without explicitly opening the file. Implied open attributes are ignored if the file is opened explicitly.

Syntax:



Semantics:

<internal-file-identifier>
: This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
: This field can contain any valid file attribute described in this section.

Examples:

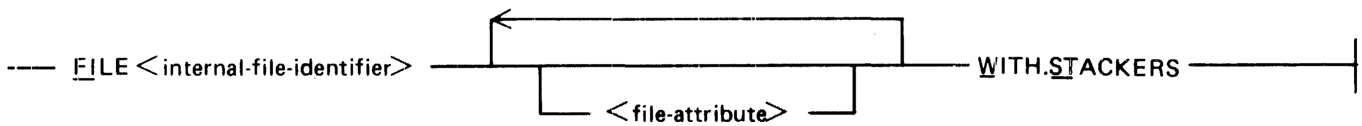
EXECUTE A/B; FILE PUNCHFILE WITH.PUNCH;

MODIFY PROG1; FILE PAYPUNCH WPU;

WITH.STACKERS

The WITH.STACKERS file attribute applies to files that are opened implicitly, and sets the data recorder STACKERS attribute. An implied open of a file occurs when a program performs a read or write operation on a file without explicitly opening the file. Implied open attributes are ignored if the file is opened explicitly.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

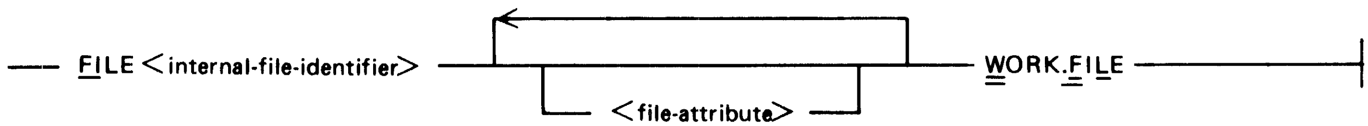
EXECUTE A/B; FILE PUNCHFILE WITH.STACKERS;

MODIFY PROG1; FILE PAYPUNCH WST;

WORK.FILE

The WORK.FILE file attribute assigns the file as a work file to be used internally. To make the file name unique, a work file has the mix number of the program substituted for part of the first name.

Syntax:



Semantics:

<internal-file-identifier>
This field can contain any valid internal file identifier in a program and specifies the file for which the <file-attribute> is being changed.

<file-attribute>
This field can contain any valid file attribute described in this section.

Examples:

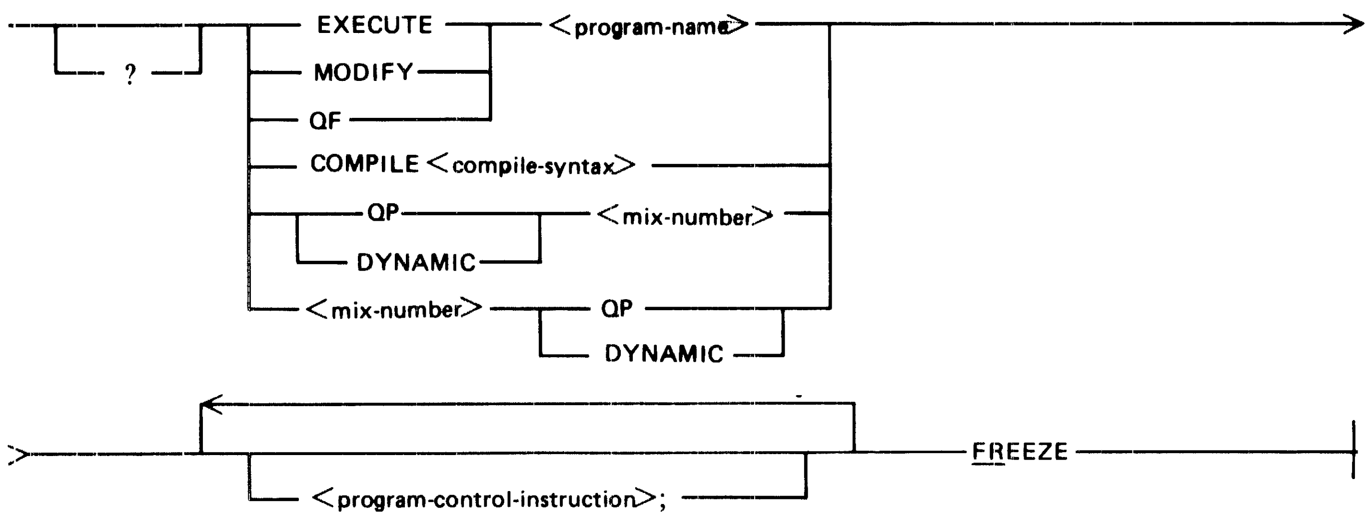
EXECUTE A/B; FILE WORK1 WORK.FILE;

MODIFY PROG1; FILE PAYWORK WFL;

FREEZE

The FREEZE program control instruction prohibits the rolling out to disk of the base-to-limit area of a program during its execution. The base-to-limit area remains in the same memory location until the program goes to end of job (EOJ). The base-to-limit area of a program contains the data for the program. The FREEZE status can be removed using the UNFREEZE program control instruction.

Syntax:



Semantics:

<program-name>
  This field can contain any valid B 1000 program name.

<compile-syntax>
  For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
  This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
  This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

Examples:

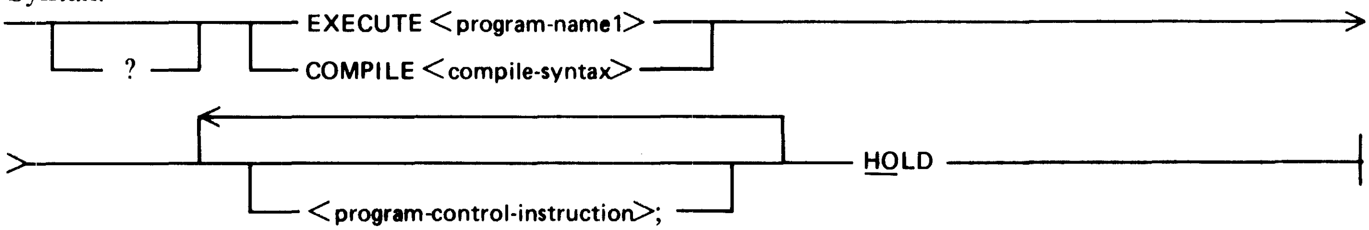
EXECUTE A/B FREEZE;

1236 DY FR

HOLD

The HOLD program control instruction places a program in the waiting schedule, thus prohibiting its execution until it is forced into the active schedule by the FS system command described in Section 5.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE or COMPILE instruction.

Examples:

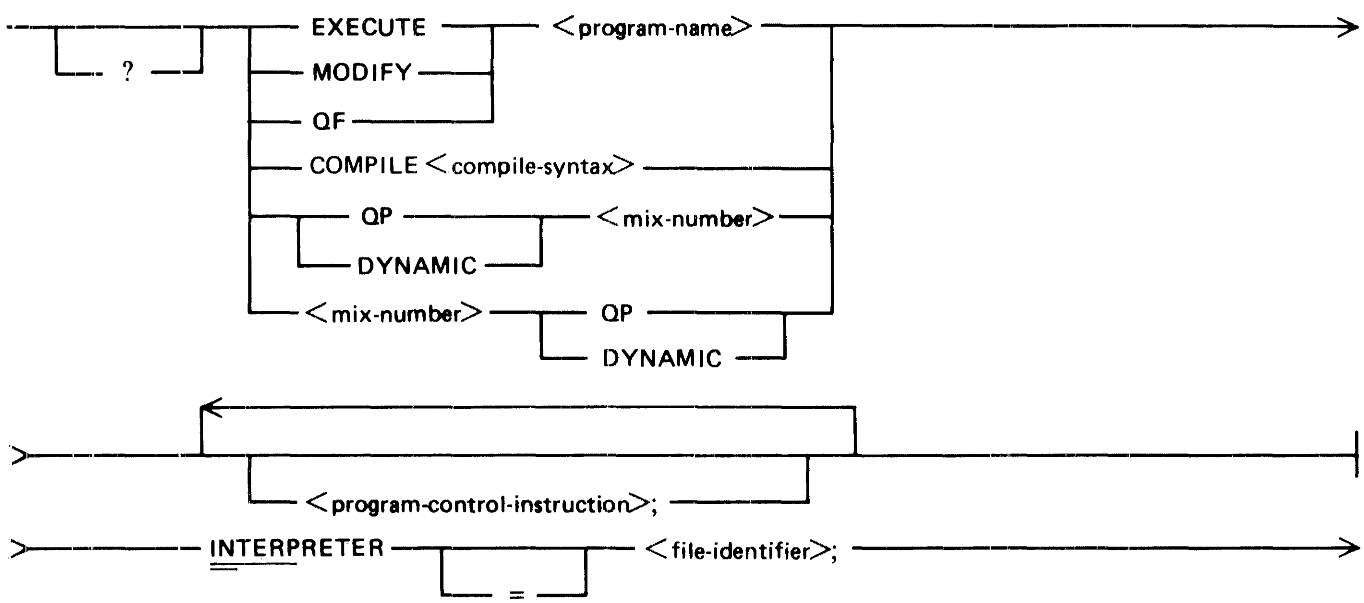
EXECUTE DMPALL HOLD;

COMPILE MILL/GEARS FORTRAN LI HO;

INTERPRETER

The INTERPRETER program control instruction specifies the interpreter to be used by the program.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

Examples:

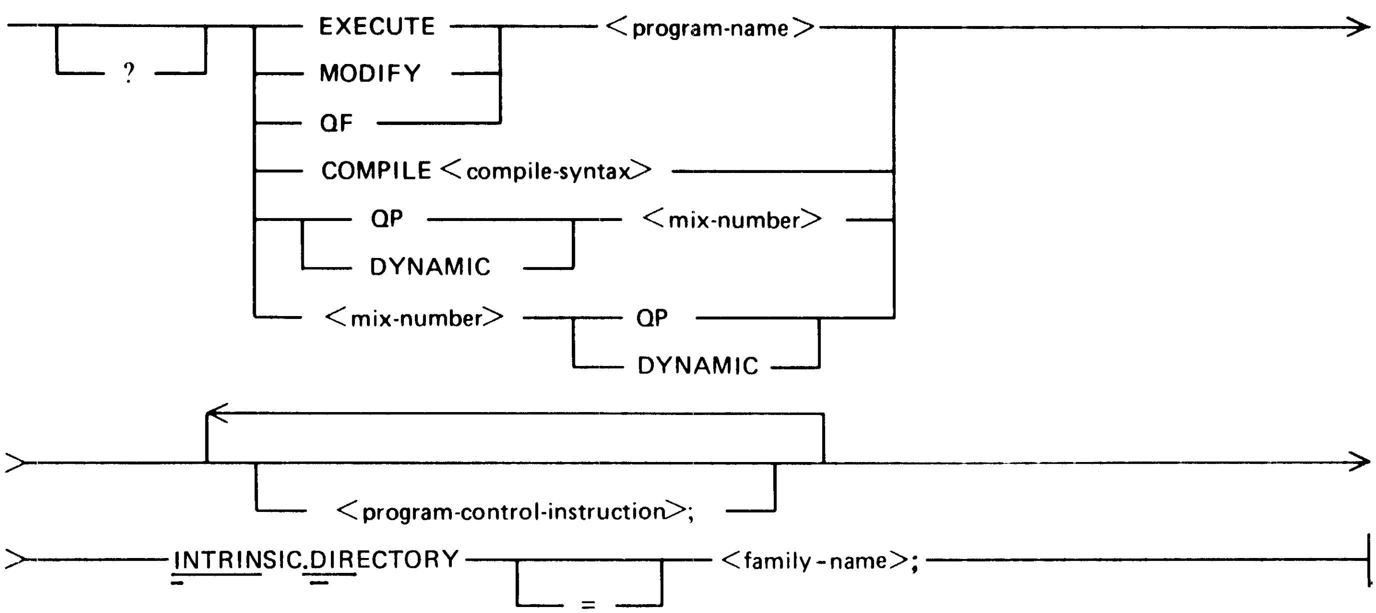
EXECUTE BETA/ALPHA INTERPRETER COBOL/INTERP001;

EX X/Y IN CCC/SDL/INTERP3;

INTRINSIC.DIRECTORY

The INTRINSIC.DIRECTORY program control instruction causes the MCP to use a specified user pack to locate the intrinsic files.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
: This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<family-name>
: This field can contain any valid 10-character B 1000 disk identifier and specifies the name of the user disk on which the intrinsic files are located.

Examples:

EXECUTE ALPH/BETA; INTRIN.DIR = UTILPACKA;

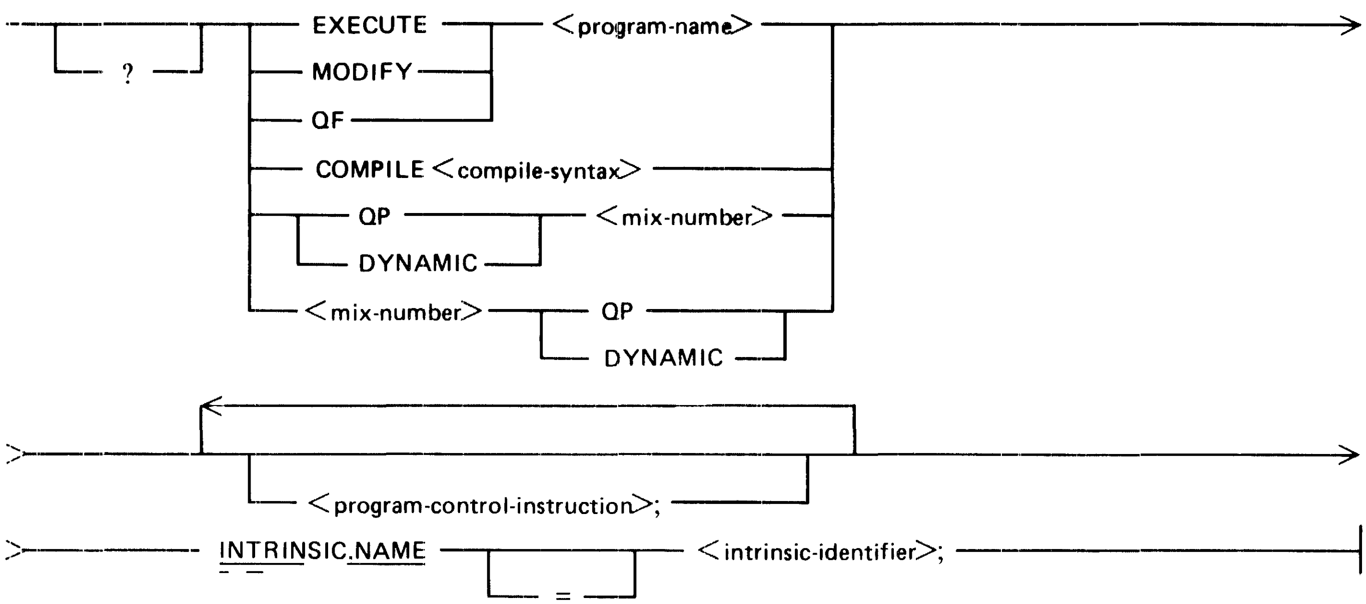
EX B; ID USER;

INTRINSIC.NAME

The INTRINSIC.NAME program control instruction specifies the first name portion of the file identifier for an intrinsic file that is requested by the program.

The subfile directory portion of the file identifier for an intrinsic file named AGGREGATE cannot be changed.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
: This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<intrinsic-identifier>
: This field can contain a 10-character string and specifies the first name portion of the file identifier for the intrinsic file.

Examples:

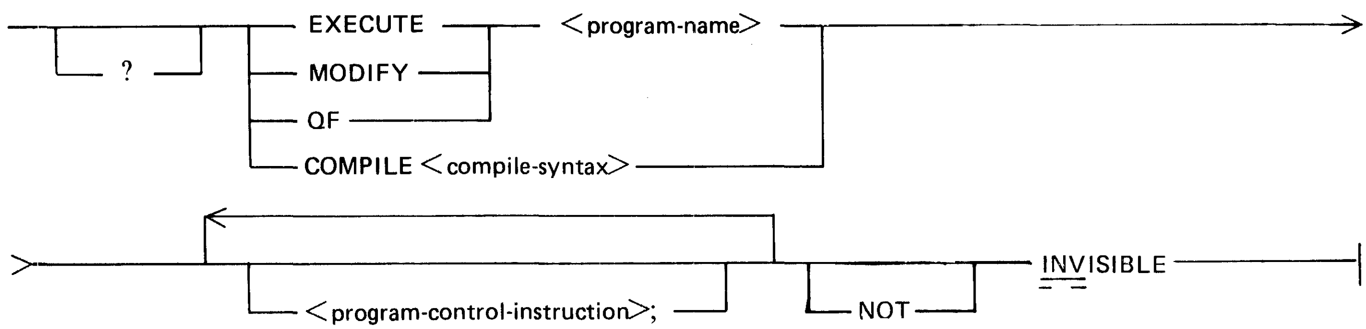
EXECUTE ALPHA/BETA; INTRINSIC.NAME ZZZ.INTRIN;

EX B; IT TEST.INTRIN;

INVISIBLE

The INVISIBLE program control instruction suppresses the appearance of the task and its associated information in the output of the MX or WY system commands described in Section 5. This instruction is intended to minimize ODT traffic by hiding system-oriented programs that remain in the mix but whose status is not usually of interest to the operator. The INVISIBLE flag can be set and reset using the IV system command described in Section 5.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, or COMPILE program control instruction.

Examples:

EXECUTE A/B; INVISIBLE

MODIFY TEST INV

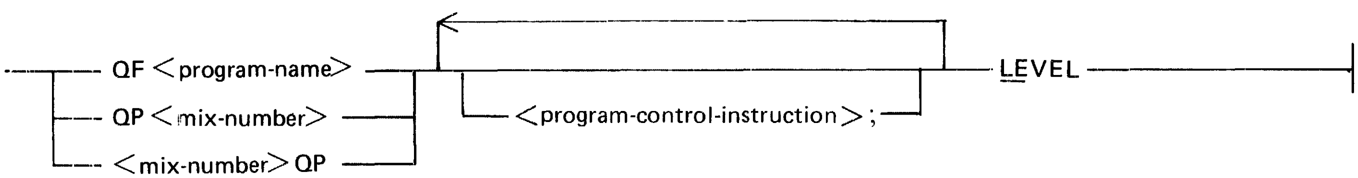
LEVEL

The LEVEL program control instruction queries the compiler level of a program.

The compiler level indicates which S-operators generated by the compiler are valid for the associated interpreter. If an S-operator is changed or removed from the interpreter, the level of the compiler is increased by one and the user is required to recompile the programs to use that interpreter. The compiler level is not affected by the addition of a new S-operator. New S-operators are usually added as new features in the compiler attributes.

When a program goes to beginning of job, the MCP ensures that the program and its associated interpreter have the same level. This check can be bypassed using the OVERRIDE program control instruction.

Syntax:



Semantics:

<program-name>
This field can contain any program name that is currently in the disk directory.

<mix-number>
This field can contain any mix number of a program currently executing.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the QF or QP program control instruction.

Examples:

QF DMPALL LEVEL;

123 QP LE;

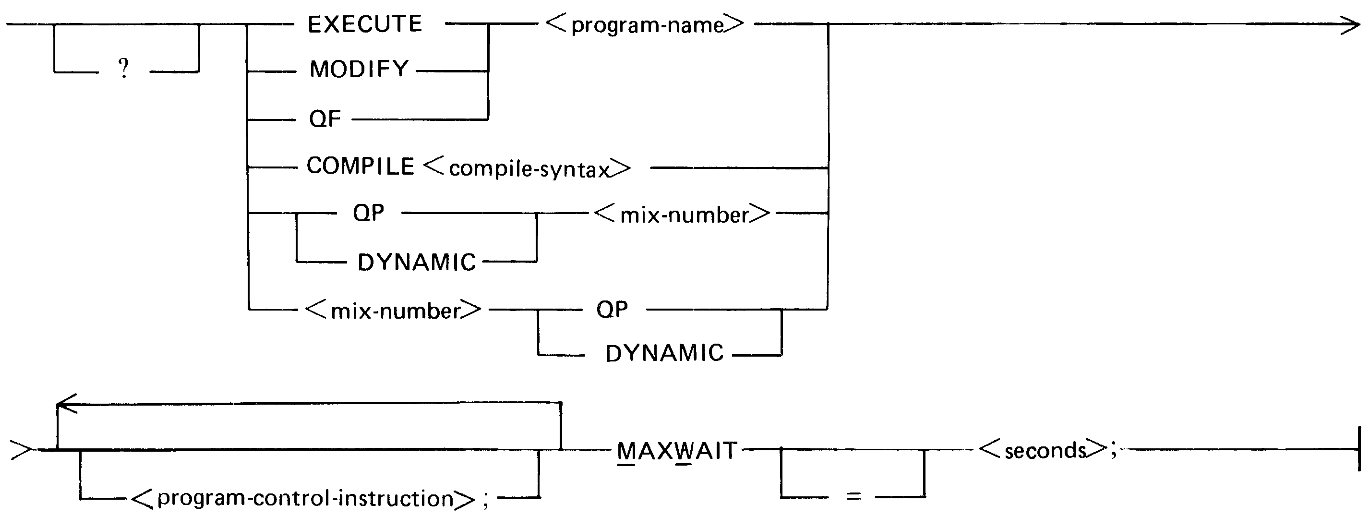
QP 5628 LEVEL;

MAXWAIT

The MAXWAIT program control instruction specifies the maximum amount of time, in seconds, that a DMS program waits on contention for a locked record.

If the value specified by the MAXWAIT program control instruction is exceeded, a deadlock exception condition is returned to the DMS program. The default value is zero. The default setting causes the DMS program to use the MAXWAIT value associated with the data base that it opens. The default MAXWAIT value for a data base is 180 seconds.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
: This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<seconds>
: This field can contain any integer and specifies the number of seconds to wait on contention for a locked record.

Examples:

EXECUTE WORK/DMS/BATCH; MAXWAIT = 20;

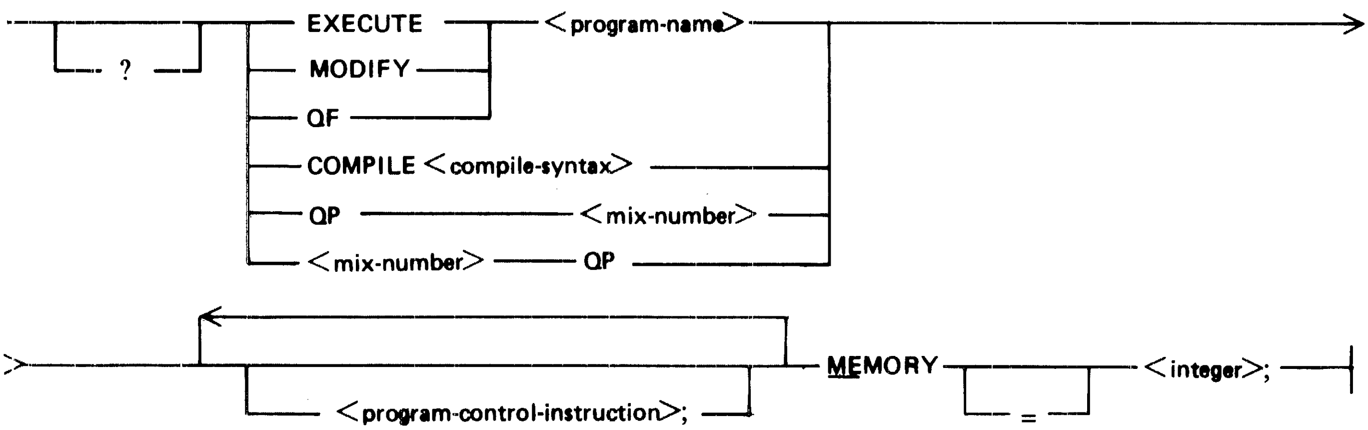
EX TEST; MW 5;

MEMORY

The MEMORY program control instruction overrides the dynamic memory size assigned by the compiler for a program at execution time.

The program remains in the active schedule if there is not enough dynamic memory available to run the program.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
: This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, or QP program control instruction.

<integer>
: This field can contain any integer in the range 0 to 16,777,208 inclusive, and specifies the amount of dynamic memory in bits for use by the program.

Examples:

```
COMPILE DIVIDENDS COBOL SYNTAX; MEMORY = 50000;

EXECUTE DOCUMENT/EDITOR; ME 40000;
```

MEMORY.PRIORITY

The MEMORY.PRIORITY program control instruction assigns a priority to code segments in memory for a program.

The MEMORY.PRIORITY program control instruction is valid only when the Priority Memory Management algorithm is being used by the MCP. This algorithm is set with the MPRI MCP option.

When a program code segment is read into memory by the MCP, the memory space it occupies is given an initial priority equal to the value specified by the MEMORY.PRIORITY program control instruction. Program code segments of one program cannot overlay those of another program that have a higher memory priority, thus allowing more important program code segments to be protected. However, program code segments that are not referenced by the program for a period of time decay to a lower memory priority. If the memory priority becomes low enough, the program code segment is overlayed. Usually, the period of time that causes the program code segment to decay is equal to 1.5 times the SAMPLING.INTERVAL value, unless the SECONDS.BEFORE.DECAY program control instruction specifies a different interval for program code segments that are marked important. If a program code segment is accessed by a program at any time before being overlayed, its memory priority is restored to the original value.

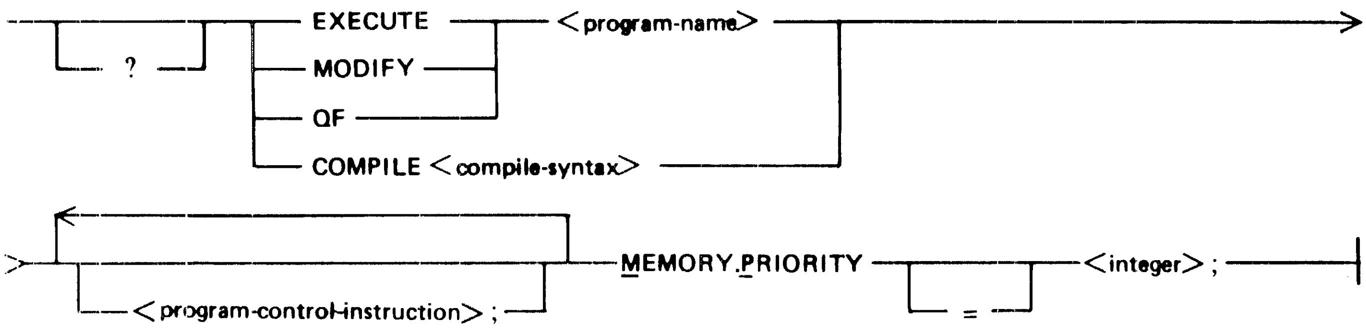
A MEMORY.PRIORITY value of 9 or greater is referred to as a crashout priority, and has many additional effects. If insufficient overlayable memory space for a request having a crashout priority is available, the MCP deallocates save memory space having a lower memory priority. Such a deallocation is performed on the run structure (base-to-limit area) of a lower-priority program, and results in an abbreviated rollout of the program selected as the victim. This action performed by the MCP is called crashout, and it suspends the victim and writes only the base-to-limit area of the program (not any file or code memory space) to temporary disk storage. It then makes the space occupied by the run structure available to satisfy the memory request. The MCP periodically (at each N.SECOND interval) reinstates any victim programs that were crashed out.

Entering a program having a crashout priority in the active schedule does not cause any crashout actions to be taken on running programs in order to begin the high-priority task. Crashout can be caused only by an executing program having a MEMORY.PRIORITY value of 9 or greater, and whose MEMORY.PRIORITY value is higher than that of the program that is to be crashed out. For example, a program with a MEMORY.PRIORITY value of 12 cannot cause crashout on any other program with a MEMORY.PRIORITY value of 12 or above, but can cause any program with a MEMORY.PRIORITY of less than 12 to be crashed out.

After a program has gone to beginning of job, any queries or changes to the MEMORY.PRIORITY value in the working copy of the program must be accomplished through the MP system command described in Section 5.

Refer to Appendix A for a complete description of the MCP Memory Management mechanism.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, or COMPILE program control instruction.

<integer>
This field can contain any integer in the range 0 to 15 inclusive, and specifies the memory priority assigned to program code segments.

Examples:

EXECUTE A/B; MEMORY.PRIORITY = 8;

EX NETWORK/CONTROLLER; MP 15;

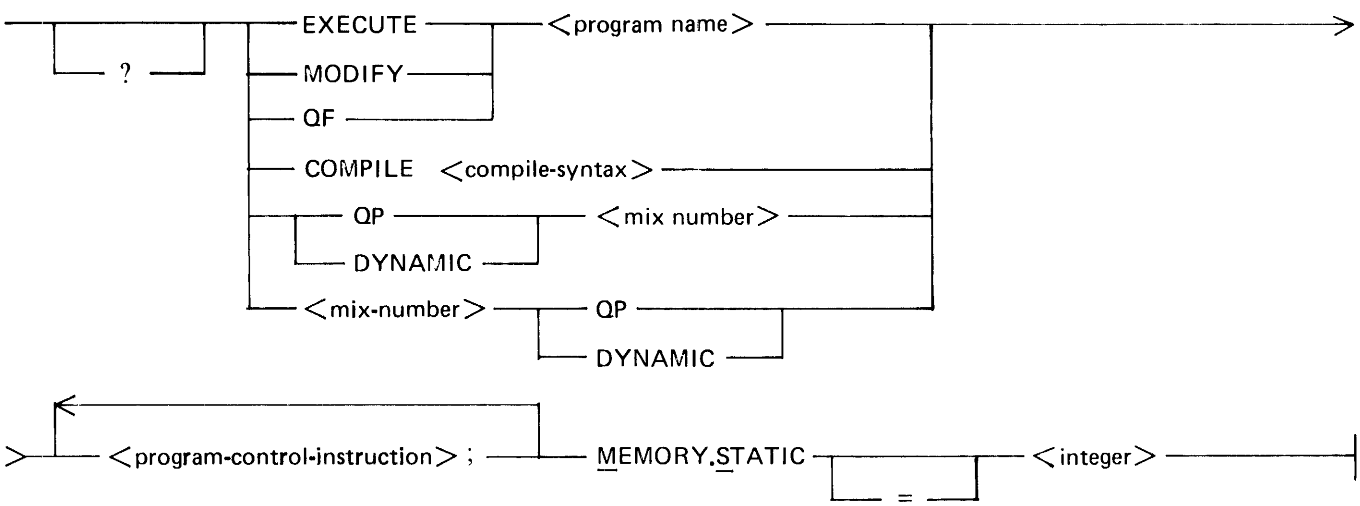
MEMORY.STATIC

The MEMORY.STATIC program control instruction overrides the default static memory size of a program at execution time.

When programs that are written in SDL or SDL2 are DSed due to stack overflows, the situation can often be avoided by increasing the size of the static memory used by the program. The MCP will proportionately increase the size of all stack combinations, based upon the new static memory size, the next time the program is executed.

When MEMORY.STATIC is used with COMPILE statements, the static memory is reserved for the compiler, not the program compiled.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled to be executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXCUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<integer>
This field can contain any integer in the range 0 to 16,777,208 inclusive, and specifies the amount of static memory in bits for use by the program.

Examples:

COMPILE DIVIDENDS COBOL SYNTAX;MS = 50000

EX SCHEDULES;MS = 330000;

MODIFY

The MODIFY program control instruction permanently changes the attributes of an object program using other program control instructions.

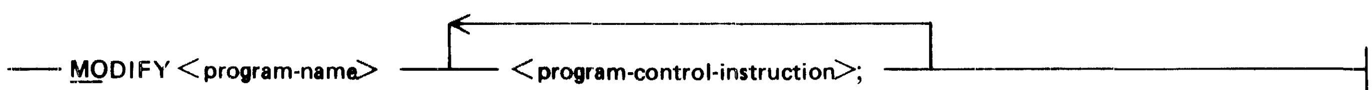
The MODIFY program control instruction must be the first of a series of program control instructions pertaining to the modification of the object program.

If the object program referenced in the MODIFY program control instruction resides on a user disk, the disk identifier must be part of <program-name> in order for the MCP to locate the correct file.

The values specified by the following program control instructions can be changed using the MODIFY program control instruction.

CHARGE	OVERRIDE
CONDITIONAL	PRIORITY
FILE	PROCESSOR.PRIORITY
FREEZE	PROTECTED
INTERPRETER	RR
INTRINSIC.DIRECTORY	SCHEDULE.PRIORITY
INTRINSIC.NAME	SECONDS.BEFORE.DECAY
INVISIBLE	SWITCH
MAXTIME	TIME
MAXWAIT	UNCONDITIONAL
MEMORY.PRIORITY	UNFREEZE
NODIF	UNOVERRIDE
OPTION	VIRTUAL DISK

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 object program name that follows the B 1000 file-naming conventions and specifies the program to be modified.

<program-control-instruction>
This field can contain any valid program control instruction described in this section that is allowed to follow a MODIFY program control instruction.

Example:

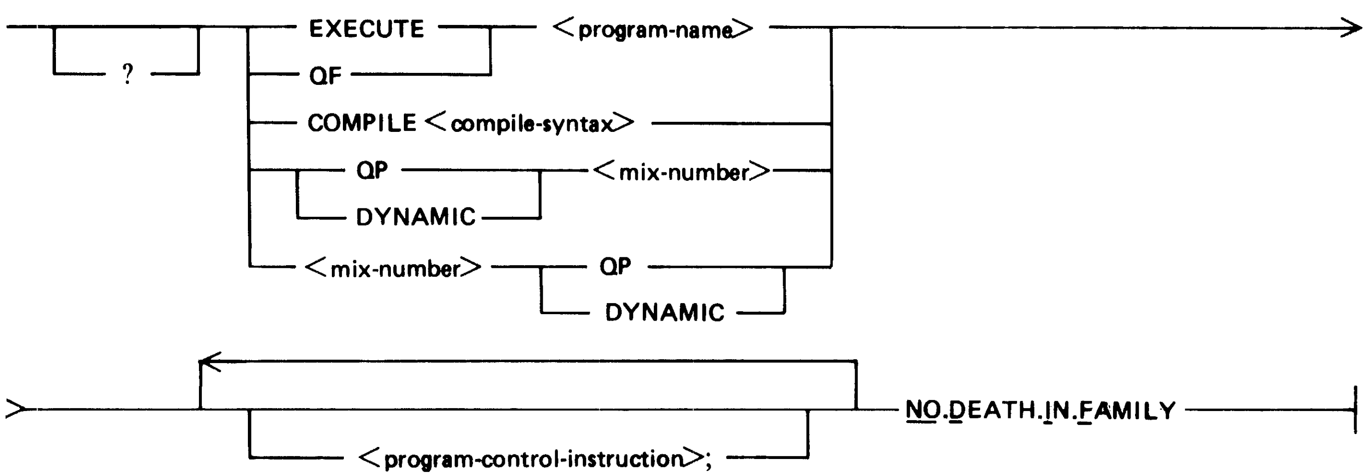
MODIFY A/B PRIORITY 6;

NO.DEATH.IN.FAMILY

The NO.DEATH.IN.FAMILY program control instruction allows a program that is spawned by another program to continue running if the parent (controlling) program terminates.

All programs spawned by a controlling program are terminated by the MCP if the controlling program terminates and the NO.DEATH.IN.FAMILY program control instruction is not specified. If the NO.DEATH.IN.FAMILY program control instruction is specified when the task is executed, the task continues to run even if the parent program terminates. Control is linked to the next higher level, which can ultimately be the MCP. The output is then routed to some other location (for example, to the ODT or the line printer).

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, QF, COMPILE, QP, or DYNAMIC program control instruction.

Examples:

COMPILE A/Y COBOL LI; NO.DEATH.IN.FAMILY;

DYNAMIC 758 NODIF;

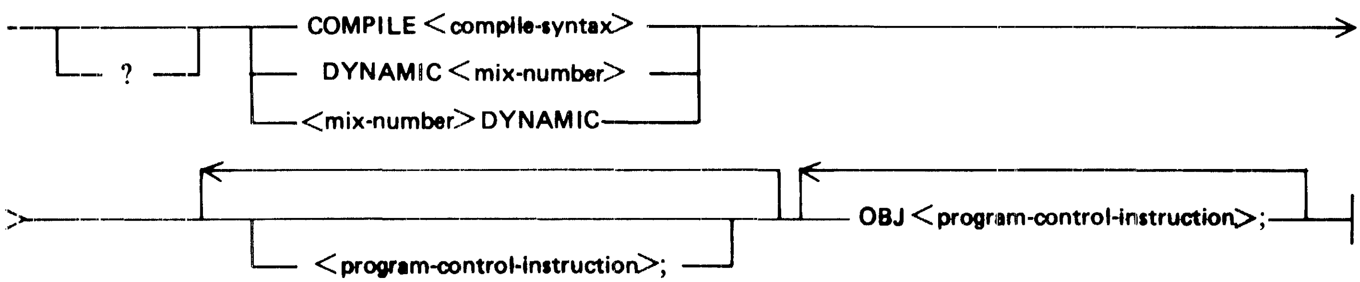
OBJ

The OBJ program control instruction is used as a prefix to another program control instruction and causes that instruction to reference a compiled object program. The OBJ program control instruction must therefore be associated with a compilation.

The OBJ program control instruction is used only after the COMPILE program control instruction or after a DYNAMIC program control instruction that references a compilation. It causes the program control instruction that follows it to refer to the object file of the compilation, instead of referring to the compiler itself.

All modifications specified by program control instructions that are paired with an OBJ program control instruction are queued by the MCP and, following successful compilation, are used to perform an automatic MODIFY program control instruction on the object program. Only those program control instructions that are allowed to follow the MODIFY program control instruction can be used following the OBJ program control instruction.

Syntax:



Semantics:

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed compilation.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow the MODIFY program control instruction.

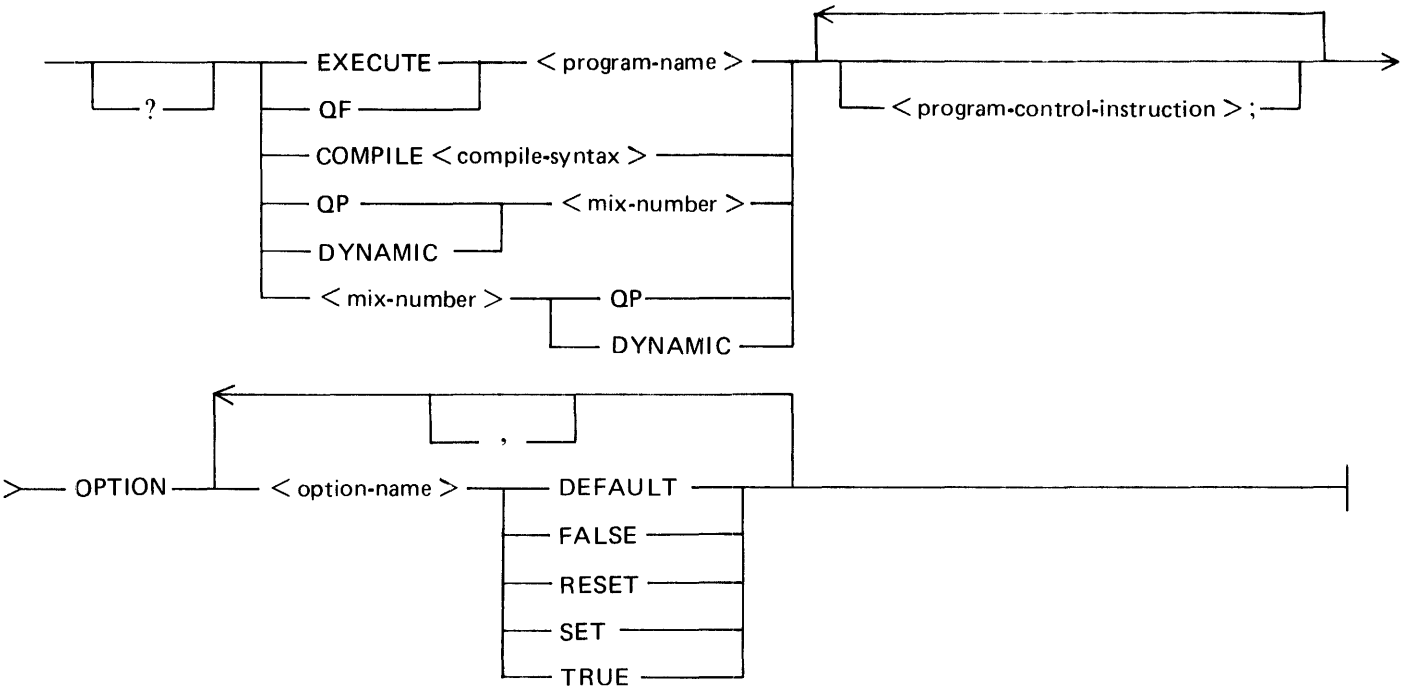
Examples:

```
COMPILE TEST/PROGRAM COBOL LIBRARY;
FILE CARDS NAME SOURCE/TEST DISK;
OBJ FILE LINE NO HARDWARE LABEL.TYPE = 1;
PRIORITY 5;
OBJ PROCESSOR.PRIORITY 9;
OBJ MEMORY.PRIORITY 5;
MEMORY 25000;
OBJ MEMORY 15000

DYNAMIC 1234; OBJ PR 6; OBJ FILE CARDS DISK;
```

OPTION

The OPTION program control instruction allows 13 individual system options to be associated with a program, taking precedence over the system setting of those options. This permits, for example, options that can result in substantial ODT message traffic, such as OPEN and CLOS, to be invoked only for those jobs needing the additional information. The option settings of a WFL job task are inherited by its initiated tasks.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, QF, COMPILE, QP, or DYNAMIC program control instruction.

<option-name>
Option-name can be the BREL, CLOS, COPY, LIB, OPEN, PBD, PBF, PBT, RMOV, SCHM, TERM, TRMD, or ZIP system options.

DEFAULT
The DEFAULT keyword causes the job to use the system setting for the option.

FALSE
The FALSE keyword causes the option to be reset for the job.

RESET
The RESET keyword causes the option to be reset for the job.

SET
The SET keyword causes the option to be set for the job.

TRUE
The TRUE keyword causes the option to be set for the job.

Pragmatics:

Specification of DEFAULT is redundant, except in the case of modifies, either static (MO) or dynamic (DY). The DEFAULT setting causes the corresponding site value of the option to be used. The MCP rejects attempts to DY or QP the SCHM option for any program that is not a WFL job task.

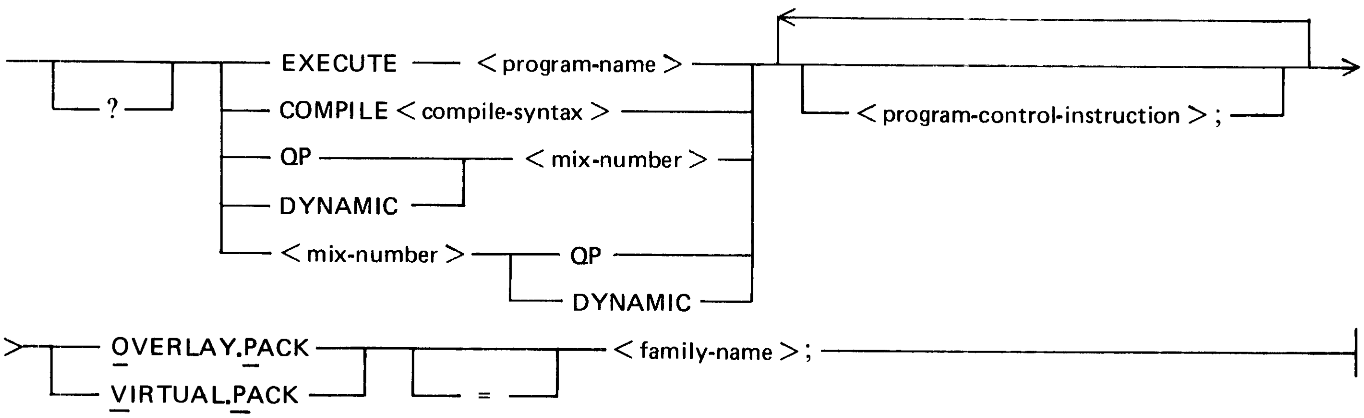
Examples:

```
EX MASTER/SPAWNER; OPTION ZIP RESET
COPY & COMPARE PAYROLLDB/= TO PAYBACK (KIND=TAPE); OPTION COPY SET
MO COBOL74 OPTION BREL SET, LIB SET
EX DEVELOPMNT/PROBLEM/PROGRAM OPTION OPEN SET, CLOS SET
DY 171 OPTION OPEN RESET, PBF DEFAULT
```

OVERLAY.PACK

The OVERLAY.PACK program control instruction overrrides the site-selected DL OVERLAY designation and causes data overlays for a job to be directed to a specific pack. The disk may not be a multi-pack-file continuation pack.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
: This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, COMPILE, QP, or DYNAMIC program control instruction.

<family-name>
: This field can contain any valid 10-character B 1000 disk identifier and specifies the name of the user disk to which data overlays are rolled out. A <family-name> of DISK causes the system disk to be used.

Examples:

```
CO BIG/PROGRAM COBOL74B LI;FI CARD NAM MASTER/PAYROLL/SOURCE DSK;
ME 800000;OP GOLIATH % overrides the DL OVERLAY designation

EX SYSTEM/PANDA;AX DISK CHECK;VIRTUAL.DISK 2000;OVERLAY.PACK RED;

QP 3341 OP
```

OVERRIDE

The OVERRIDE program control instruction causes the compatibilty check normally made between a program and its interpreter to be bypassed.

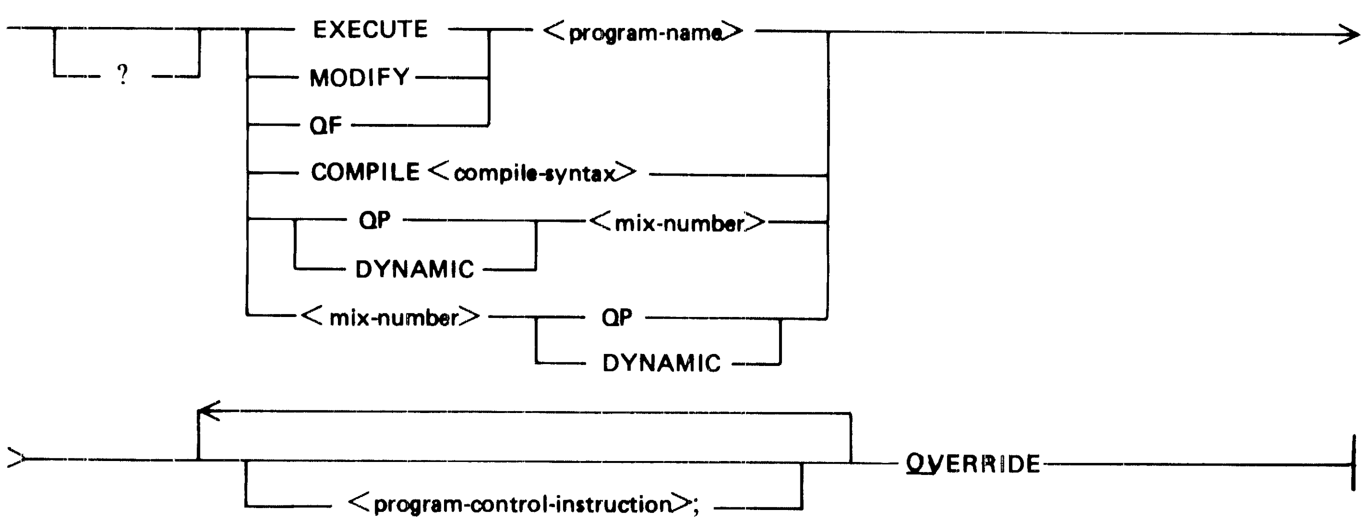
At the beginning of job, the MCP performs a compatibility check of a program and its interpreter, unless the OVERRIDE program control instruction is specified. The compatibility check performs the following functions.

- Examines the HARDWARE.TYPE field of the interpreter for a value of U (Universal), or matches the type of processor (S or M) on which it is running.
- Compares the MCP.LEVEL field of the interpreter with the LEVEL field of the MCP.
- Compares the GISMO.LEVEL field of the interpreter with the LEVEL field of GISMO.
- Compares the COMPILER.LEVEL field of the interpreter with the COMPILER.LEVEL field of the program.
- Compares the ARCHITECTURE (language) field of the interpreter with the INTERPRETER.FIRST.NAME field of the program.
- Examines the interpreter to see if it has at least all attributes required by the program.

Using the OVERRIDE program control instruction does not bypass the interpreter generation process of the MCP.

The UNOVERRIDE program control instruction can be used to reset the OVERRIDE program control instruction and causes the compatiblity check to be performed.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

Examples:

EXECUTE A/B; OVERRIDE;

MODIFY TEST OV;

DYNAMIC 275 OV;

PRIORITY

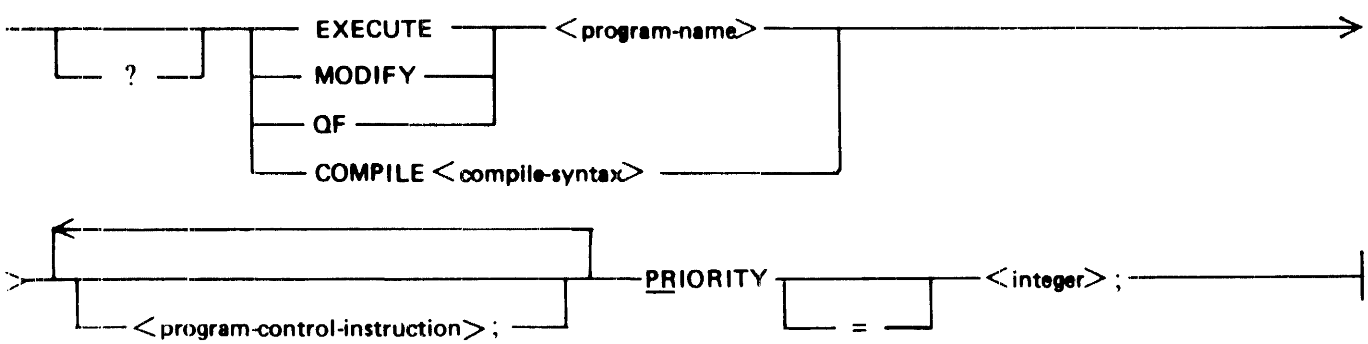
The PRIORITY program control instruction specifies the operational processor priority of a program by setting the PROCESSOR.PRIORITY value.

If the MPRI MCP option is not set, the crashout capabilities normally associated with MEMORY.PRIORITY values of nine or greater are associated with PROCESSOR.PRIORITY instead.

After a program has gone to beginning of job, any queries or changes to the PRIORITY value in the working copy of the program must be accomplished through the MP, PP, or PR system commands described in Section 5.

Refer to the MEMORY.PRIORITY and PROCESSOR.PRIORITY program control instructions in this section for a complete description of their use.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
: This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, or COMPILE program control instruction.

<integer>
: This field can contain any integer in the range 0 to 15 inclusive, and specifies the operational priority assigned to the program.

Examples:

EXECUTE A/B PRIORITY = 10;

COMPILE TEST COBOL LIBRARY PR 9;

PROCESSOR.PRIORITY

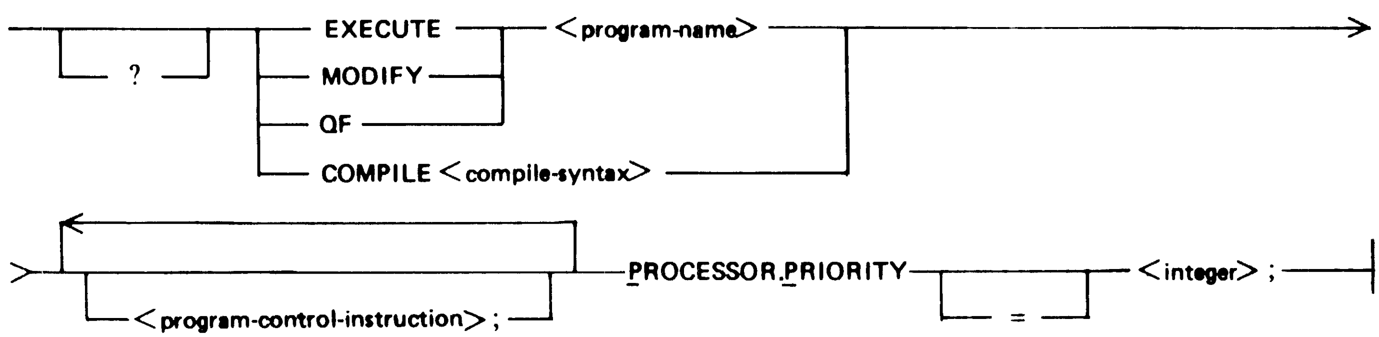
The PROCESSOR.PRIORITY program control instruction specifies the processor usage priority assigned to a program. This instruction is allowed only when the MPRI MCP option is set.

If the value specified by the PROCESSOR.PRIORITY program control instruction is nine or greater, the following actions occur.

- The SCHEDULE.PRIORITY is assigned the same value unless it is explicitly set to some other value using the SCHEDULE.PRIORITY program control instruction.
- The program is not considered by the MCP in determining whether or not the mix limit has been reached. Refer to the ML command in Section 5 for a complete description of the mix limit.
- If the MPRI MCP option is not set, the crashout capability invoked when the value of MEMORY.PRIORITY is nine or greater is invoked by the PROCESSOR.PRIORITY program control instruction.

After a program has gone to beginning of job, any queries or changes to the PROCESSOR.PRIORITY value in the working copy of the program must be accomplished through the PP system command described in Section 5. Refer to Appendix A for a complete description of the MCP memory management functions.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, or COMPILE program control instruction.

<integer>
This field can contain any integer in the range 0 to 15 inclusive, and specifies the processor priority assigned to the program. Zero is the lowest priority and 15 is the highest priority.

Examples:

```
EXECUTE A/B PROCESSOR.PRIORITY = 6;
COMPILE TEST COBOL LIBRARY PP 5;
```

PROTECTED

The PROTECTED program control instruction causes the MCP to protect the program against entry of the following system commands described in Section 5.

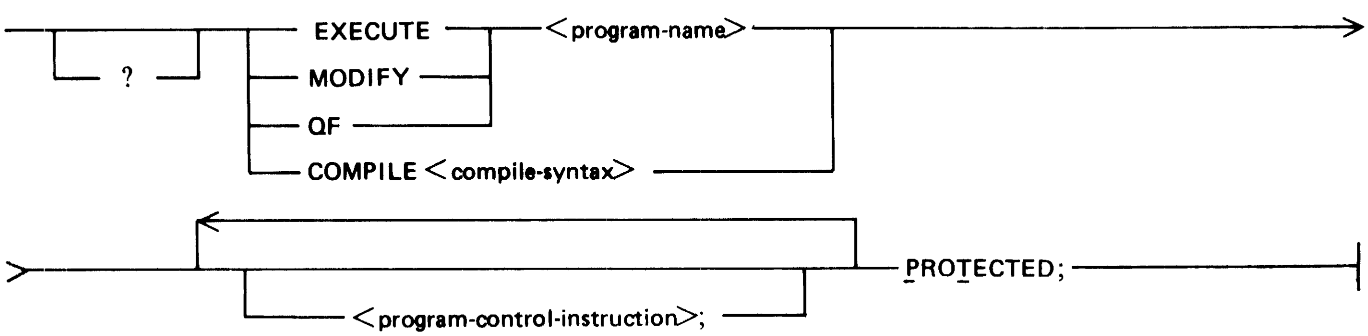
CL
DP
DS
QC
ST
SW

The DP, DS, ST, and SW system commands are allowed to reference a spawned task from the parent remote terminal.

If a protected program reaches an abnornal termination, the MCP automatically unlocks it so that it can be discontinued with the DS or DP system commands.

After a program has gone to beginning of job, any queries or changes to the PROTECTED attribute in the working copy of the program must be accomplished through the LP system command described in Section 5.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, or COMPILE program control instruction.

Examples:

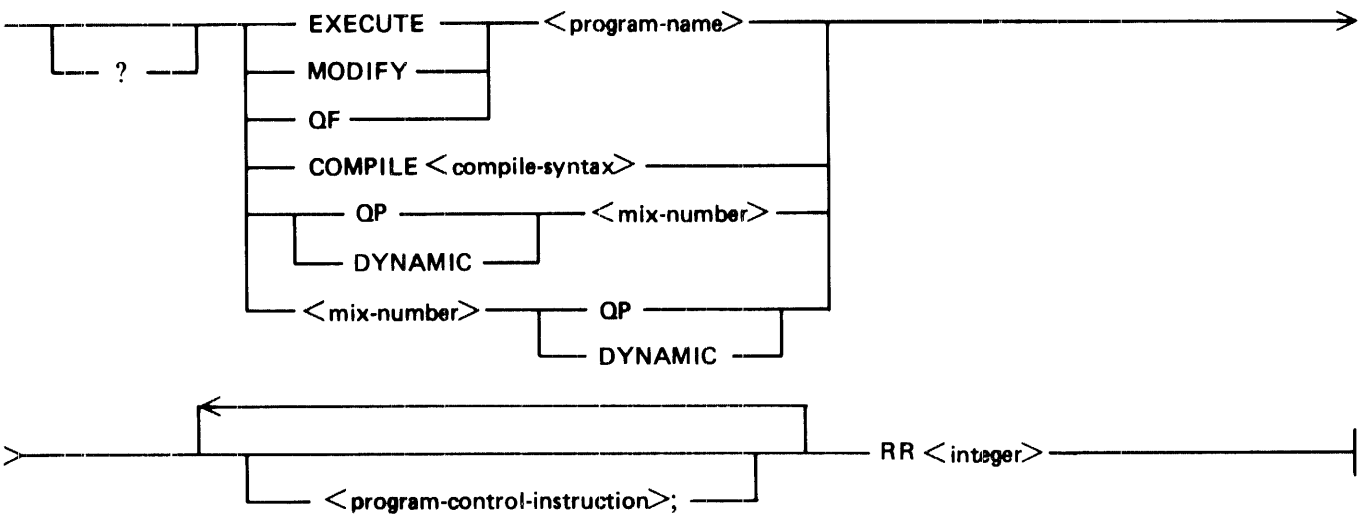
EXECUTE REMOTE/UPDATE PROTECTED;

COMPILE TEST/PROGRAM COBOL74 LIBRARY PT;

RR

The RR program control instruction assigns restrictions to a task.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
: This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<integer>
: This field can contain any integer in the range 0 to 3 inclusive, and specifies the level of restrictions for the task.

If RR 0 is specified, there are no restrictions applied to the task.

If RR 1 is specified, the USER <usercode>/<password> system command (described in Section 5) must be included in ZIP system commands, and direct line printer output is not allowed.

If RR 2 is specified, direct line printer output is not allowed.

If RR 3 is specified, the USER <usercode>/<password> system command (described in Section 5) must be included in ZIP system commands, and direct line printer output and card input are not allowed.

Non-zero values of the RR attribute determine which system commands can be zipped from a program. Refer to Section 5 for more details.

Examples:

EXECUTE A/B RR 2;

MODIFY TEST/PROGRAM RR 1;

RUN

The RUN program control instruction causes the MCP to call an object program from a library for subsequent execution. The syntax of the RUN program control instruction is in the *B 1000 Systems WFL Language Manual.*

START

The START program control instruction causes a WFL job to be initiated. For a complete description of the syntax and semantics of the START program control instruction, refer to the *B 1000 Systems WFL Language Manual.*

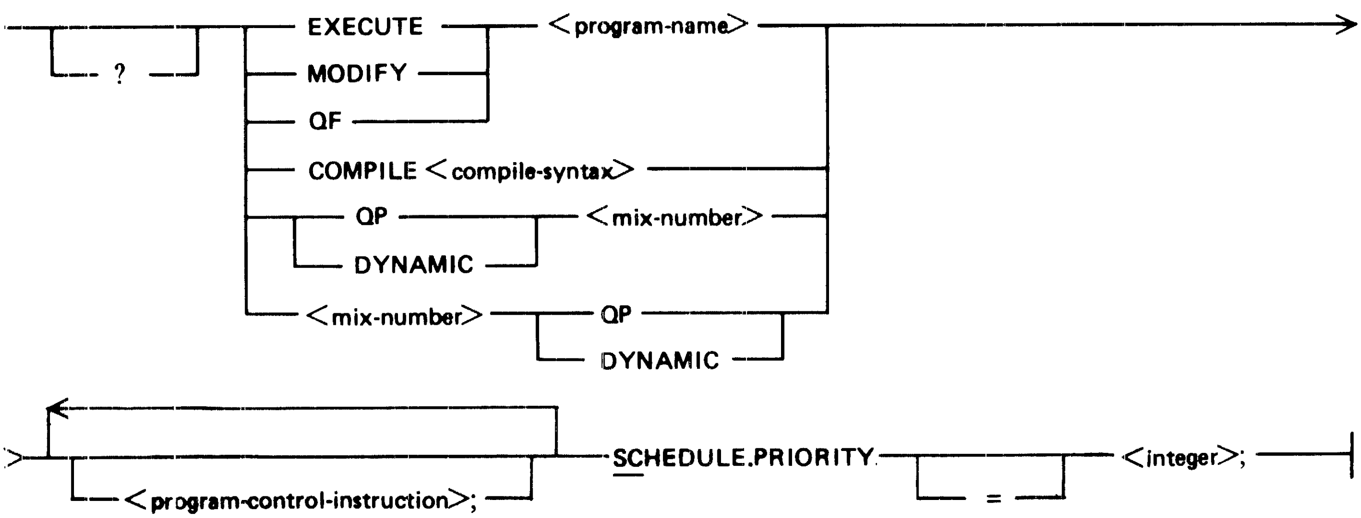
SCHEDULE.PRIORITY

The SCHEDULE.PRIORITY program control instruction assigns priorities to programs in the schedule.

The priority set by the SCHEDULE.PRIORITY program control instruction affects only the schedule priority of a program and is not related to the priorities set by the PROCESSOR.PRIORITY or the MEMORY.PRIORITY program control instructions.

Programs in the active schedule that have the same SCHEDULE.PRIORITY value are scheduled on a first-in, first-out basis.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<integer>
This field can contain any integer in the range 0 to 14 inclusive, and specifies the priority in which programs in the active schedule are scheduled. Zero is the lowest priority and 14 is the highest priority.

Examples:

EXECUTE A/B SCHEDULE.PRIORITY = 12;

COMPILE TEST/PROGRAM COBOL74 LI SC 7;

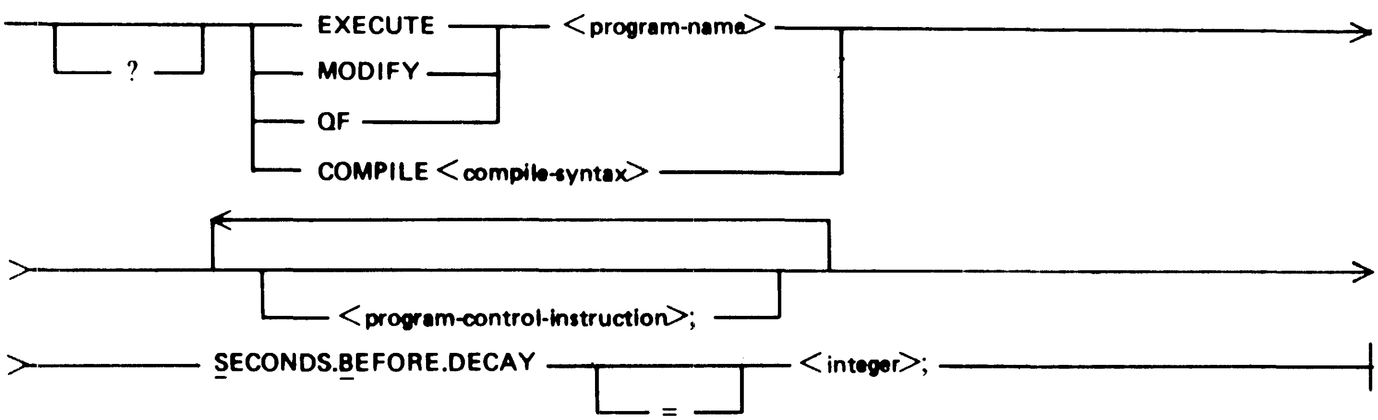
SECONDS.BEFORE.DECAY

The SECONDS.BEFORE.DECAY program control instruction specifies the length of time to protect unreferenced code segments marked as IMPORTANT from being degraded to a lower memory priority. This attribute is valid only when the MPRI MCP option is set.

The SYSTEM/MARK-SEGS system utility program marks specific code segments of a program as IMPORTANT for use with the SECONDS.BEFORE.DECAY program control instruction. Refer to the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the SYSTEM/MARK-SEGS system utility program.

After a program has gone to beginning of job, any queries or changes to the SECONDS.BEFORE.DECAY value in the working copy or the program must be accomplished through the SB system command described in Section 5. Refer to Appendix A, MCP Memory Management, for further operational details on Priority Memory Management.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, or COMPILE program control instruction.

<integer>
This field can contain any integer in the range 0 to 600 inclusive, and specifies the length of time in seconds before an unreferenced code segment marked IMPORTANT is reduced (decayed) to a lower memory priority. If <integer> is zero, all code segments of a program, whether marked as IMPORTANT or not, are treated as not IMPORTANT.

Examples:

EXECUTE A/B MEMORY.PRIORITY = 15; SECONDS.BEFORE.DECAY = 250;

EX NDL/HANDLER MP 15; SB 600;

STREAM

The STREAM program control instruction informs the MCP of the name of a punched card file that is to be treated as a stream data file.

A stream data file consists of all data cards contained between the stream beginning and the stream end. The stream beginning is identified by the STREAM program control instruction. The stream end is identified by the TERMINATE program control instruction. The file identifier specified in the TERMINATE program control instruction must be the same as on the corresponding STREAM program control instruction to end the stream data file.

The STREAM and TERMINATE program control instructions are similiar to DATA CTLDCK and ENDCTL used in pseudo-reader loading, but are more generalized.

When a program reads a stream data file, the EXCEPTION branch is taken any time a card with a question mark (?) or invalid character is read from column one. The MCP replaces column one of that card image with binary zeroes (@00@) prior to passing the card image to the reading program. The program receives the end-of-file exception only when the proper TERMINATE program control instruction has been read.

Syntax:

```
──┬─────┬── STREAM <file-identifier>; ──────────────────────┤
  └─ ? ─┘
```

Semantics:

<file-identifier>
: The field can contain any valid two-name file identifier and specifies the name of the stream data file.

Example:

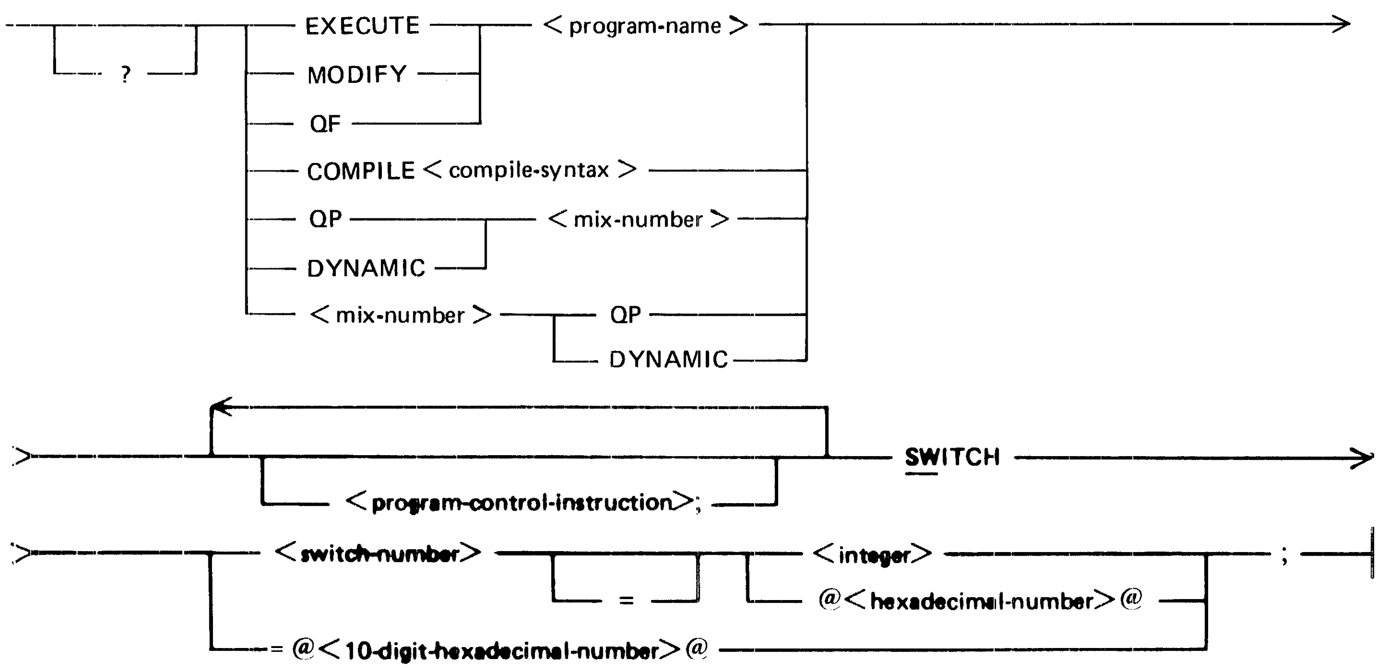
```
?STREAM CARDS;
?COMPILE TEST WITH COBOL74 LIBRARY;
?CHARGE 123456;
?FILE CARDS NAME = SOURCE/TEST DISK;
?EXECUTE TEST CHARGE 123456;
?DATA CARDIN;
        .
        .(data cards)
        .
?END CARDIN;
?TERMINATE CARDS;
```

SWITCH

The SWITCH program control instruction sets the program switches used by a program.

To modify or query the switches after that program has gone to beginning of job, refer to the SW and TS system commands, respectively, described in Section 5.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<switch-number>
This field can contain any integer in the range 0 to 9 inclusive, and specifies the switch to be assigned a value.

<integer>
This field can contain any integer in the range 0 to 9 inclusive, and specifies the value of the switch.

<hexadecimal-number>
This field can contain any hexadecimal number in the range 0 to F inclusive, and specifies the value of the switch.

<10-digit-hexadecimal-number>
This field can contain any 10-digit hexadecimal number in the range of 0000000000 to FFFFFFFFFF inclusive, and the ordinal position of each hexadecimal digit corresponds to its respective switch. For example, specifying SWITCH = @0070000000@ causes switch 2 to be set to 7.

Examples:

EXECUTE A/B SWITCH 0 = 5; SWITCH 1 = 3;

COMPILE COBOL74 SW 1 = 1;

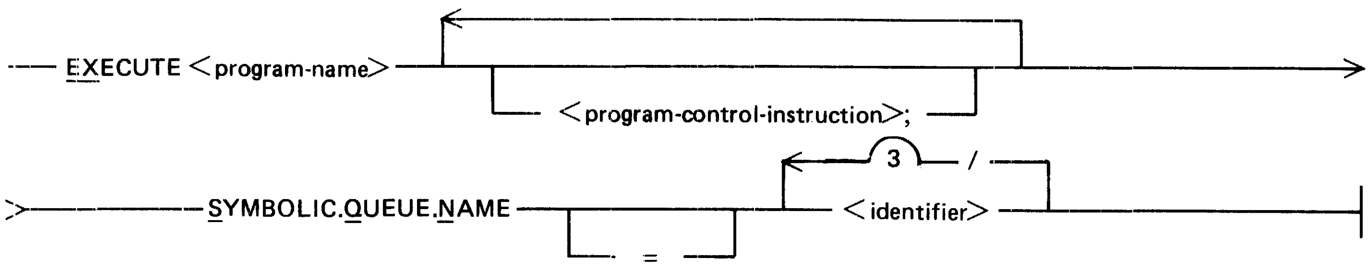
EXECUTE TEST/PROGRAM SW = @00013F0000@;

SYMBOLIC.QUEUE.NAME

The SYMBOLIC.QUEUE.NAME program control instruction initializes the SYMBOLIC.QUEUE.NAME of the INITIAL INPUT CD of a COBOL 74 program.

The SYMBOLIC.QUEUE.NAME syntax is used by an MCS. When an MCS executes a COBOL 74 program that uses a queue created previously by the MCS, the MCS initializes the SYMBOLIC.QUEUE.NAME in the INITIAL INPUT CD using the SYMBOLIC.QUEUE.NAME syntax. The SYMBOLIC.QUEUE.NAME value can be set only on a ZIP; it cannot be modified. A COBOL 74 program with an INITIAL INPUT CD that is not executed with a SYMBOLIC.QUEUE.NAME value set has blanks (spaces) put into the INITIAL INPUT CD queue name.

Syntax:



Semantics:

<program-name>
: This field can contain any valid COBOL 74 program name.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow the EXECUTE program control instruction.

<identifier>
: This field is an identifier containing from 1 to 12 characters. When the queue is created, only the first 10 characters of the first <identifier> are used by the COBOL 74 program as the queue name. That is, the COBOL 74 program must ensure that the last 38 characters of the SYMBOLIC.QUEUE.NAME attribute are blank.

TERMINATE

The TERMINATE program control instruction informs the MCP that the stream data file has reached the end of file.

Refer to the STREAM program control instruction for additional information concerning the use of the TERMINATE program control instruction.

Syntax:

```
──┬─────┬── TERMINATE <file-identifier>; ──────────────────────┤
  └─ ? ─┘
```

Semantics:

<file-identifier>
This field can contain any valid one- or two-name file identifier and specifies the same name as specified in the corresponding STREAM program control instruction.

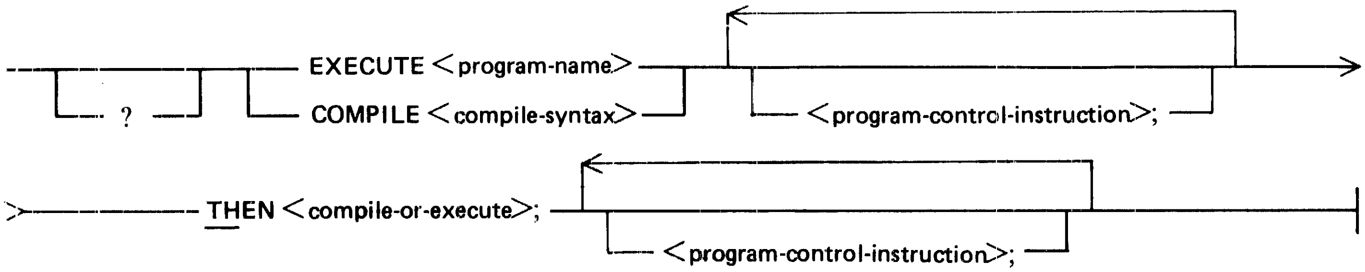
Example:

```
?STREAM CARDS;
?COMPILE TEST WITH RPG LIBRARY;
?CHARGE 123456;
?FILE CARD NAME = SOURCE/TEST DISK;
?EXECUTE TEST CHARGE 123456;
?DATA CARDIN;
        .
        .(data cards)
        .
?END CARDIN;
?TERMINATE CARDS;
```

THEN

The THEN program control instruction conditionally schedules the execution of a program in relation to another program.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE or COMPILE instruction.

<compile-or-execute>
This field can contain any valid COMPILE or EXECUTE program control instruction.

Examples:

EXECUTE A/B THEN COMPILE BETA COBOL74 SYNTAX; UNCONDITIONAL;

COMPILE TEST/PROGRAM COBOL74 LI TH EX TEST;

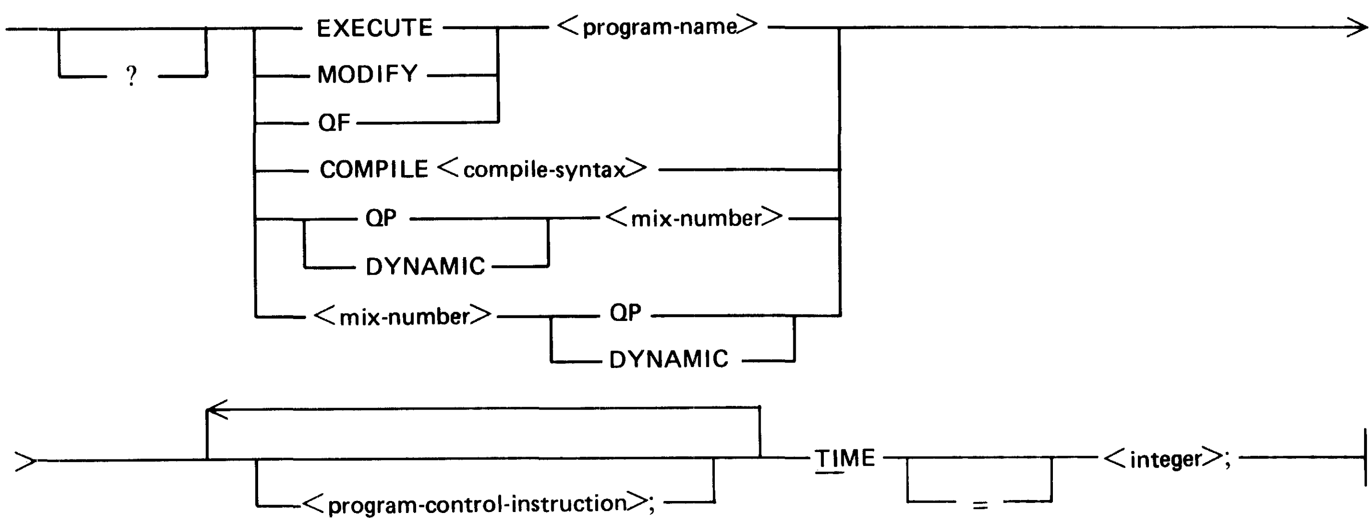
TIME

The TIME program control instruction specifies the maximum allowable processor time a program can accumulate.

If a processor time limit is set for a program with the TIME program control instruction and the program exceeds the time limit, it is discontinued by the MCP and the following message is displayed.

EXCEEDED MAXIMUM RUN TIME ALLOWED

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<integer>
This field can contain any integer in the range 1 to 27,962 inclusive, and specifies the amount of processor time (not elapsed time) in minutes that a program can accumulate before being discontinued.

Examples:

EXECUTE A/B TIME = 5;

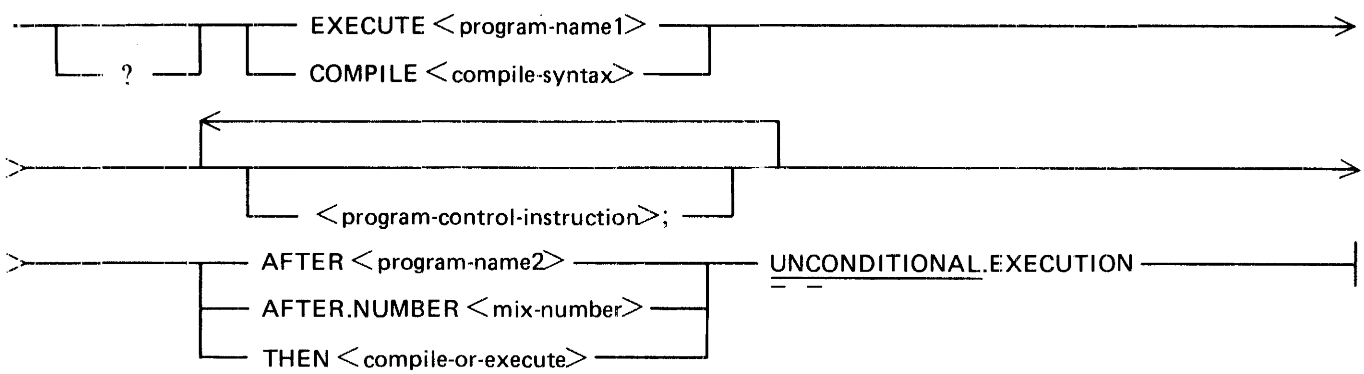
COMPILE TEST/PROGRAM COBOL74 LIBRARY TI 12;

UNCONDITIONAL.EXECUTION

The UNCONDITIONAL.EXECUTION program control instruction is used in conjunction with the AFTER, AFTER.NUMBER, and THEN program control instructions and forces a program to beginning of job regardless of the outcome of its predecessor.

If the UNCONDITIONAL.EXECUTION program control instruction is not specified for a successor program and the predecessor abnormally terminates, or is a compilation that terminates with syntax errors, the MCP places that program in the WAITING SCHEDULE and waits for an RS or FS system command described in Section 5.

Syntax:



Semantics:

<program-name1>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE or COMPILE instruction.

<program-name2>
This field can contain any valid B 1000 program name and specifies the name of an executing or scheduled to be executed program. The program specified by <program-name2> must terminate before the execution specified by <program-name1> or the compile specified by <compile-syntax> is performed.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program. The program specified by <mix-number> must terminate before either the execution specified by <program-name1> is done or the compile specified by <compile-syntax> is performed.

<compile-or-execute>
This field can contain any valid COMPILE or EXECUTE program control instruction.

Examples:

EXECUTE A/B AFTER C/D; UNCONDITIONAL.EXECUTION;

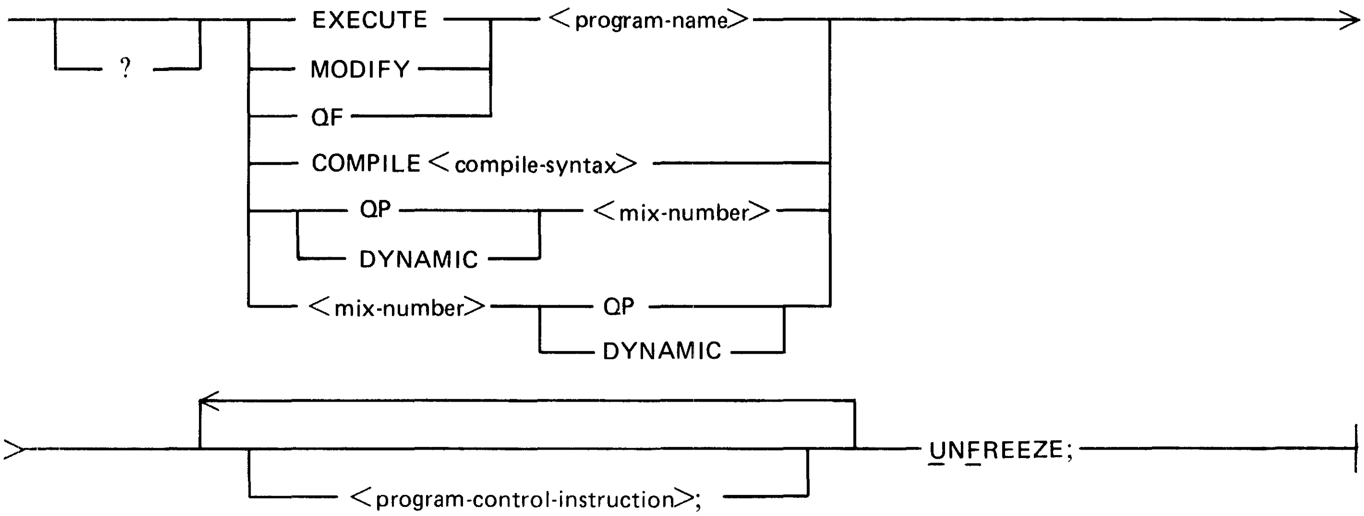
EX A/B AF C/D; UNCONDITIONAL;

COMPILE TEST/PROGRAM COBOL74 LIBRARY; THEN EXECUTE TESTER; UC;

UNFREEZE

The UNFREEZE program control instruction attribute removes the FREEZE condition from a program and permits the base-to-limit area of a program to be rolled out to disk when the program is in an interrupted state. The base-to-limit area of a program contains the data for the program.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

Examples:

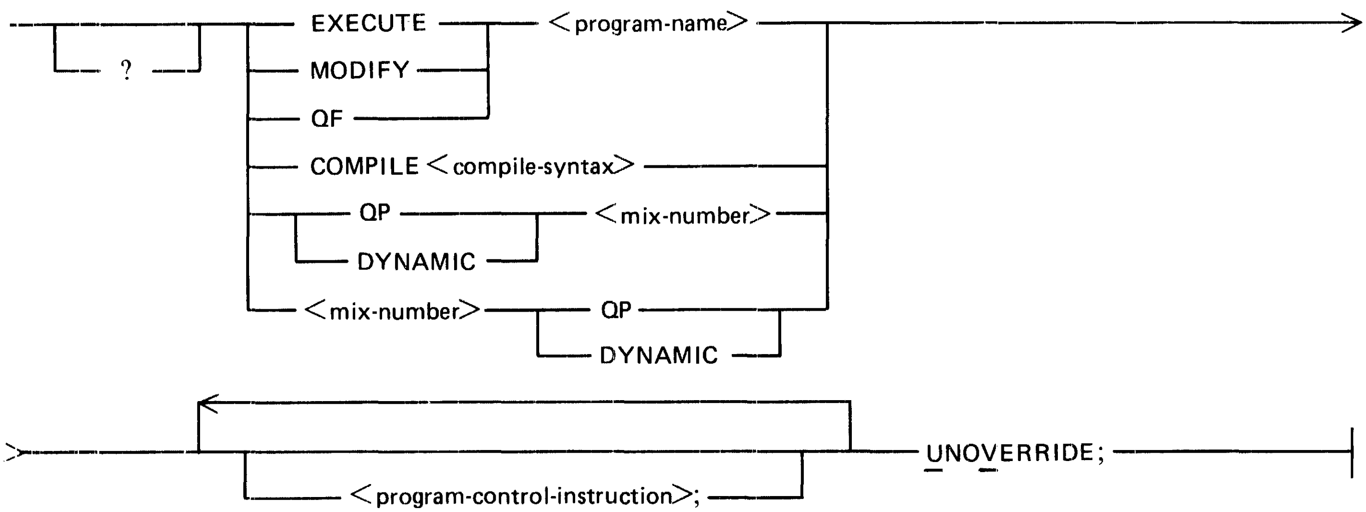
EXECUTE A/B UNFREEZE;

COMPILE TEST/PROGRAM COBOL74 LIBRARY UF;

UNOVERRIDE

The UNOVERRIDE program control instruction resets the compatibility check bypass caused by specifiying the OVERRIDE program control instruction. Refer to the OVERRIDE program control instruction in this section for a description of the interpreter compatibility checking functions.

Syntax:



Semantics:

<program-name>
: This field can contain any valid B 1000 program name.

<compile-syntax>
: For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
: This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
: This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

Examples:

EXECUTE A/B UNOVERRIDE;

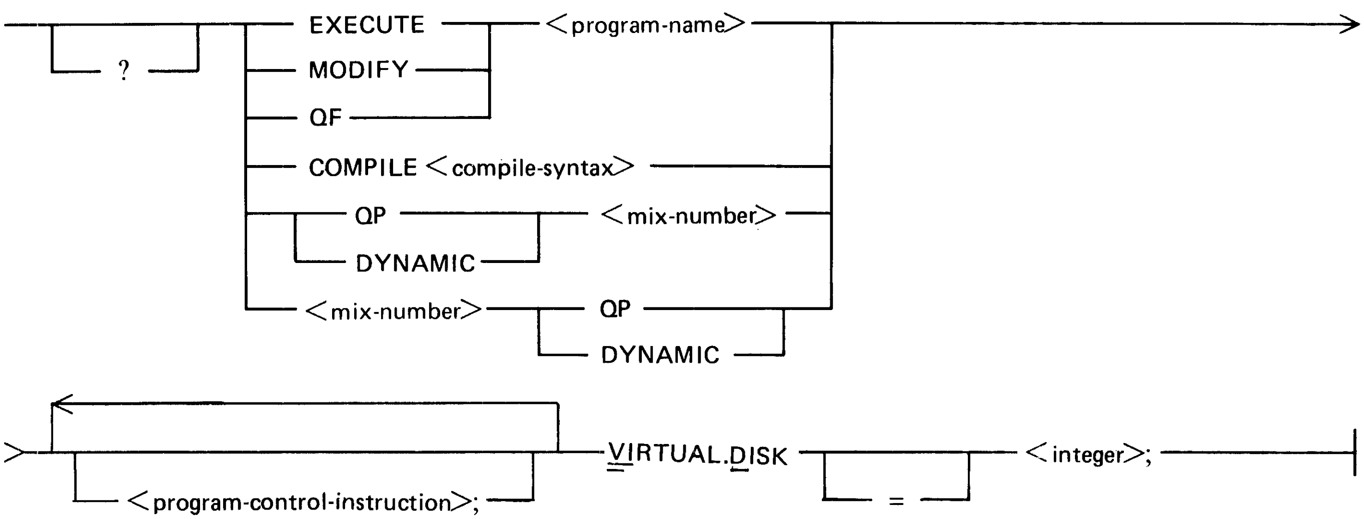
MODIFY TEST/PROGRAM UV;

VIRTUAL.DISK

The VIRTUAL.DISK program control instruction changes the number of disk segments assigned to hold non-memory-resident data overlays during program execution. Virtual disk is the secondary storage area for overlayable data and dynamic memory is the primary storage area.

If the value provided by the VIRTUAL.DISK program control instruction is zero and the program requires disk space for data overlays, the MCP assigns a default size of 1000 disk segments to the program.

Syntax:



Semantics:

<program-name>
This field can contain any valid B 1000 program name.

<compile-syntax>
For a complete description of the syntax following the COMPILE keyword, refer to the COMPILE program control instruction in this section.

<mix-number>
This field can contain any mix number of an executing or scheduled-to-be-executed program.

<program-control-instruction>
This field can contain any valid B 1000 program control instruction described in this section that is allowed to follow either the EXECUTE, MODIFY, QF, COMPILE, QP, or DYNAMIC program control instruction.

<integer>
This field can contain any integer in the range 0 to 16,777,215 inclusive, and specifies the number of disk segments to be used for data overlays.

Examples:

```
EXECUTE A/B VIRTUAL.DISK = 4000;
COMPILE TEST/PROGRAM UPL LIBRARY VI 6000;
EX TESTER VD 2000;
```

SECTION 5
SYSTEM COMMANDS

This section contains, in alphabetic order, each system command and its description. Descriptions include railroad syntax diagrams.

Command Entry

All system commands may be entered through the system ODT. System commands may also be entered through two types of remote stations, a remote ODT and a workstation.

A remote ODT is a station whose MCS appends a restriction attribute of zero (RR = 0) to commands entered through it. All the system commands except HALT and NET are accepted through a remote ODT.

A workstation is a station whose MCS appends RR = 1, 2, or 3 to commands. This restricts commands accepted through a workstation to a subset that is specified by the RR value.

Syntax Diagrams

In this section, each syntax diagram is labeled in one of four ways: Syntax, Remote ODT syntax, Workstation syntax, System ODT Syntax.

Commands with syntax diagrams labeled syntax are accepted from all three station types — system ODT, remote ODT, workstation.

Commands with syntax diagrams labeled Remote ODT Syntax are accepted from the system ODT or from a remote ODT.

Commands with syntax diagrams labeled Workstation syntax are accepted from a workstation. These diagrams include usercodes, but the usercode may be omitted when the command is entered by a signed-on user because the SMCS and CANDE programs prefix the workstation's <usercode>/<password> to the command.

Commands with syntax diagrams labeled System ODT Syntax (the HALT and NET commands only) are valid for entry through the system ODT only.

Multiple system commands are allowed if they are separated by a semicolon (;) or a blank character. There is no valid separator for the AC command.

AB (Auto Backup)

The AB system command reserves line printer devices and the SYSTEM/BACKUP program for the MCP autoprint mechanism. The autoprint mechanism retrieves printer backup files from disk and prints them automatically, directing the output to the designated line printer. Up to four copies of the SYSTEM/BACKUP program can be specified for execution and remain in the mix, as long as there are backup files to be printed.

When the autoprint mechanism is invoked, a designated number of SYSTEM/BACKUP programs are executed. The names of candidate printer backup disk files are entered in a queue file named AUTOPRINT. Each SYSTEM/BACKUP program initiated by the autoprint mechanism reads entries from this queue and prints the file specified. Printing is done as though a PB system command had been entered with no options specified. Multiple copies can be printed by specifying a non-zero value for the REPETITIONS file attribute. Refer to the FILE program control instruction in Section 4 for a complete description of the REPETITIONS file attribute.

If the SYSTEM/BACKUP program has program switch 3 set to 0, the printer backup disk files are removed after being printed.

The SYSTEM/BACKUP programs can be made to remain in the mix as long as there are backup files to be printed. The SYSTEM/BACKUP program terminates when the AUTOPRINT queue is empty and program switch 7 is set to a non-zero value. If the AUTOPRINT queue is empty for a period of five minutes, the SYSTEM/BACKUP program terminates.

Refer to the SYSTEM/BACKUP program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the autoprint mechanism.

The SYSTEM/BACKUP programs initiated by the autoprint mechanism use only the line printers reserved by the AB system command. Backup print disk files from other programs in the mix, including other SYSTEM/BACKUP programs not initiated by the autoprint mechanism, cannot use any line printer reserved by the autoprint mechanism.

The AB system command has the following forms.

AB
: Entering the AB system command without any options causes the current autoprint value and the unit mnemonics of all line printers reserved for the autoprint mechanism to be displayed.

AB <integer>
: Entering the AB system command followed by <integer> causes <integer> number of copies of the SYSTEM/BACKUP program to be executed. If <integer> equals 0, the AUTOPRINT queue is purged, no further backup printer disk file names are allowed to be entered, and currently running SYSTEM/BACKUP programs complete the printing of their respective backup print disk files and go to end of job.

AB +<unit-mnemonic>
: Entering the AB system command with +<unit-mnemonic> reserves the specified line printer device for the autoprint mechanism. The + keysymbol is optional.

AB –<unit-mnemonic>
: Entering the AB system command with –<unit-mnemonic> releases the specified line printer device from the autoprint mechanism.

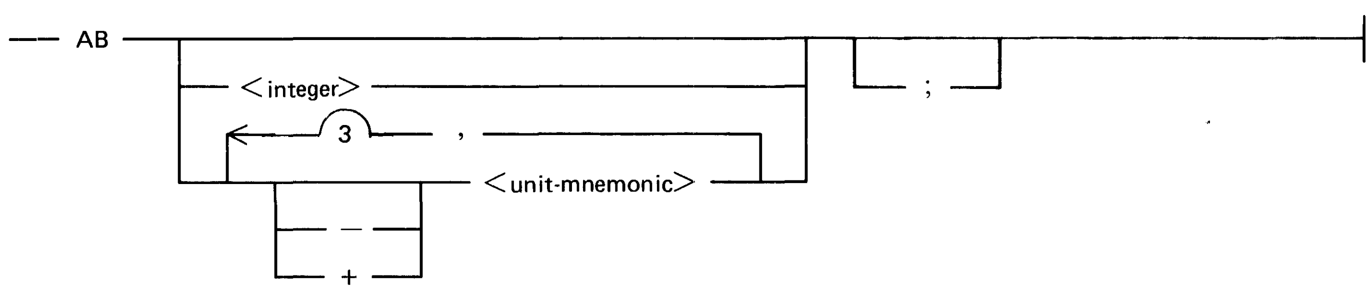
NOTE

It is the responsibility of the operator to match the number of line printers reserved for the autoprint mechanism with the number of copies of the SYSTEM/BACKUP program specified by AB <integer>. It is not desirable, for example, to specify a multiple number of SYSTEM/BACKUP programs while reserving a single line printer for the autoprint mechanism. Likewise, there is no advantage in reserving more line printers than the number of SYSTEM/BACKUP programs specified.

The autoprint mechanism can be activated in one of the following four ways.

1. Entering AB <integer> sets up the autoprint values and reserves the line printers. Also, if the any of the SYSTEM/BACKUP programs are discontinued with the DS or DP system commands, entering AB <integer> reactivates the autoprint mechanism.
2. If the autoprint mechanism was invoked and a CLEAR/START operation is required, the autoprint parameters are retained through the CLEAR/START operation and the autoprint mechanism is automatically begun after the CLEAR/START operation.
3. If a backup disk file is closed and is a candidate for the autoprint mechanism, and there are no copies of the SYSTEM/BACKUP program in use by the autoprint mechanism, the MCP executes the required number of SYSTEM/BACKUP programs.
4. If the backup designated disk (DL system command) is made ready and the AB value is non-zero, the MCP activates the autoprint mechanism. Only backup files residing on the default backup user disk are printed by the autoprint mechanism.

Syntax:



Semantics:

<integer>

This field, which must contain an integer in the range 0 to 4 inclusive, specifies the number of SYSTEM/BACKUP programs to be used.

<unit-mnemonic>

This field must contain a valid line printer unit mnemonic, for example, LPA, LPB, LPC, or LPD. The <unit-mnemonic> specifies the line printer to be reserved for the autobackup mechanism.

–

The – keysymbol releases the line printer from the autobackup mechanism.

+

The + keysymbol is optional and is equivalent to specifying <unit-mnemonic> without the + or – keysymbols.

Examples:

Command	Response
AB;	AUTO BACKUP — AB = 0 NO PRINTERS RESERVED
AB 2;	NO BACKUP FILES ON DISK
AB LPA;	LPA RESERVED FOR AUTO BACKUP.
AB;	AUTO BACKUP — AB = 2 AND LPA RESERVED FOR AUTO BACKUP.
AB LPB, −LPA;	LPB RESERVED FOR AUTO BACKUP. LPA NO LONGER RESERVED FOR AUTO BACKUP.
AB 0;AB+LPA,−LPB;	AB INTEGER = 0 LPA RESERVED FOR AUTO BACKUP. LPB NO LONGER RESERVED FOR AUTO BACKUP.

AC (Accept)

The AC system command is a response to an accept message requested by an object program through the MCP. It functions similarily as the AX system command; however, it cannot be delimited with a semicolon (;) character. If a semicolon (;) character follows the AC keyword, it is treated as if it were a part of the response.

The AC system command has an unsolicited ODT feature. The operator can enter up to ten AC system commands for a given program prior to the display of the actual accept message. The AC system commands must be entered in the order they are to be used, because the queue has a first-in, first-out structure. The queue holds a maximum of 10 messages.

The queue is automatically cleared when the program goes to end of job or when the program is discontinued with a DS or DP system command.

Syntax:

── <mix-number> AC <message> ──────────────────────┤

Semantics:

<mix-number>
: This field, which must be a mix number of a currently executing program, specifies the program to which the <message> is written.

<message>
: This field, which must contain a group of alphanumeric characters, specifies the text that is written to the program. <message> starts in the first position after the AC keyword. If <message> is shorter than the receiving field in the program, <message> is padded on the right with blank characters. If <message> is longer than the receiving field in the program, <message> is truncated on the right. The maximum <message> size allowed is 794 characters. If the size of the <message> is greater than 794 characters, it is truncated to approximately, although at least, 794 characters.

Examples:

1234ACLIST SOURCE/FILE A

8900ACDPA

632AC CHECK VOID IF OVER 500 DOLLARS

ADD (Add)

The ADD system command executes the SYSTEM/COPY program. Refer to the SYSTEM/COPY program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the ADD system command.

AL (Align Forms)

The AL system command aligns a printer device such that the print line at the top of a printer form appears in the desired location. The AL system command causes a complete line of repeated digits (from 0 to 9) to be written to the specified device or devices. If the position of the print line is not satisfactory, the operator can appropriately adjust the printer form and repeat the AL system command as necessary before allowing a program to actually open and use the printer.

Syntax:

Semantics:

<unit-mnemonic>
    This field, which must contain a valid printer unit mnemonic, specifies the unit on which the printer line is to be aligned.

Examples:

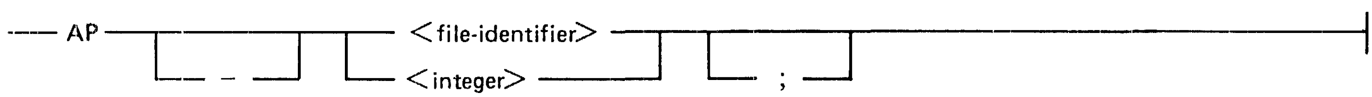
    AL LPA

    AL LPC LPB

AP (Auto Print)

The AP system command inserts printer backup files into or removes them from the autoprint queue if the autoprint mechanism is invoked. Usercode and file security are applied to <file-identifier> and <integer> as required. If <integer> is specified without a usercode, the MCP supplies BACKUP/PRT<integer> for the first part and second part of the file name, and supplies the user disk designated as backup for the family name. A minus sign preceding the <file-identifier> or <integer> removes the file from the autoprint queue but leaves it on disk for later printing.

Remote ODT syntax:



Workstation syntax:

Semantics:

<file-identifier>
: This field, which must contain a valid printer backup disk file, specifies the printer backup disk file to be printed.

<integer>
: This field must contain an integer. If the USER command precedes <integer>, the MCP supplies the usercode as the first name and user disk name if a default user disk is applicable. If the USER command does not precede <integer>, the MCP supplies BACKUP/PRT<integer> as the first part and second part of the file name.

Examples:

Command	Results
AP A/B;	Prints the file labeled A/B.
AP 152;	Prints the file labeled BACKUP/PRT152.
US X/Y AP 173;	Prints the file labeled (X)/PRT173.
AP - PRT/ARTEST	Removes PRT/ARTEST from the autoprint queue.

AT (At)

The AT system command causes <message> to be routed to a remote BNA host system. This instruction is valid from the ODT, remote terminals, or card readers. Chaining of AT system commands is not allowed. For example, specifying AT HOST2 AT HOSTX M is invalid. Responses to AT system commands are identified with the following prefix: FROM <hostname>.

<message> is not scanned or interpreted at the local host; it is in the syntax of the remote host system. An exception to this is when the AT system command is entered from a card reader (or pseudo reader); if the text following <hostname> is the STREAM program control instruction, then a file name is expected following the STREAM program control instruction, and the card file is transferred to the remote host for execution.

Syntax:

```
— AT <hostname><message>; ——————————————————————————————|
```

Semantics:

<hostname>
: This field, which must contain a valid BNA hostname in the BNA network, specifies the name of the BNA host destination for <message>.

<message>
: This field must contain a valid message to a remote BNA host. <message> is not syntaxed on the local BNA system and is routed to the remote BNA host for syntax checking and execution.

Examples:

```
AT HUB COMPILE TEST RPG LI; FILE CARDS NAME SOURCE/TEST DISK;

AT SLAVE1 DF COBOL74/=;

AT A9 RUN SYSTEM/DUMPALL ("TEACH");

?AT HOSTX STREAM TESTFILE;
      .
      .(control cards)
      .
?TERMINATE TESTFILE;
```

AX (Accept)

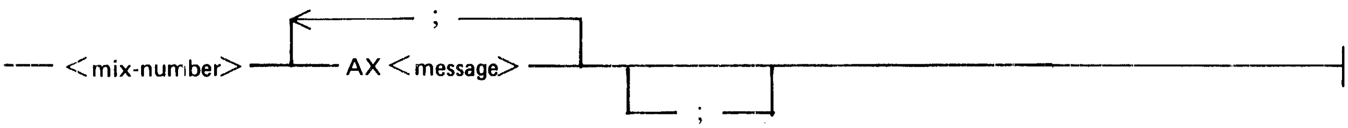
The AX system command is a response to an accept message requested by an object program through the MCP. It functions exactly like the AC system command; however, the semicolon (;) character can be used to delimit multiple AX system commands.

If the semicolon (;) character is encountered immediately after the AX system command, the MCP fills the message area in the requesting program with blank characters.

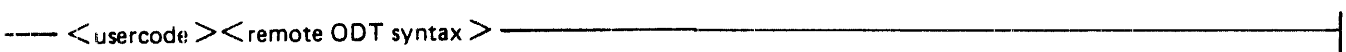
The AX system command has an unsolicited console feature in that the operator can enter any number of AX system commands for a given program prior to the time the actual accept message is displayed. The AX commands must be entered in the order they are to be used, because the queue has a first-in, first-out (FIFO) structure. The queue holds a maximum of 10 messages.

The queue is automatically cleared when the program goes to end of job or when the program is discontinued with a DS or DP system command.

Remote ODT syntax:



Workstation syntax:



Semantics:

<mix-number>
: This field, which must be a mix number of a currently executing program, specifies the program to which <message> is written.

<message>
: This field, which must contain a group of alphanumeric characters, specifies the text that is written to the program. <message> starts in the first position after the AX keyword. If <message> is shorter than the receiving field in the program, <message> is padded on the right with blank characters. If <message> is longer than the receiving field in the program, <message> is truncated on the right. The maximum <message> size allowed is 794 characters. If the size of the <message> is greater than 794 characters, it is truncated to approximately, although at least, 794 characters.

;
: The semicolon (;) character terminates the response to the accept message.

Examples:

1234AXLIST SOURCE/FILE A;

8900AXDPA

632AX CHECK VOID IF OVER 500 DOLLARS;

BB (Backup Blocks-per-area)

The BB system command specifies the number of blocks to assign each area of a printer or punch backup disk file.

The value of the backup blocks per area is set to 200 by the COLDSTART/TAPE or COLDSTART/DISK programs and, if <integer> is less than 5, a value of 200 is assigned by default.

If <integer> is not specified in the BB system command, the MCP displays the current setting of the backup blocks per area.

When an output printer or punch file is opened on disk, its file attributes are set by the MCP in the following ways.

- The value of the RECORD.SIZE file attribute is increased by 1 for punch backup files and 2 for printer backup files.
- The value of the RECORDS.PER.BLOCK file attribute is optimized by the MCP to realize optimum use of disk space.
- The value of the BLOCKS.PER.AREA file attribute is assigned the value of the BLOCKS.PER.AREA file attribute declared either in the program or the value of <integer> specified in the BB system command, whichever is larger.
- The value of the AREAS file attribute is assigned the value of the AREAS file attribute declared in the program or 25, whichever is larger.

It is possible to declare, by way of the FILE program attribute, large file sizes (BLOCKS.PER.AREA and AREAS file attributes) for specific backup files that are known to be larger than normal, while maintaining a system-wide default for all other backup files. Programs cannot decrease these attributes less than the system default values.

Remote ODT syntax:

Semantics:

<integer>
This field, which must contain an integer, specifies the default number of blocks per area to assign to each area of a printer or punch backup file. The MCP does not permit a value of less than 5 to be specified.

Examples:

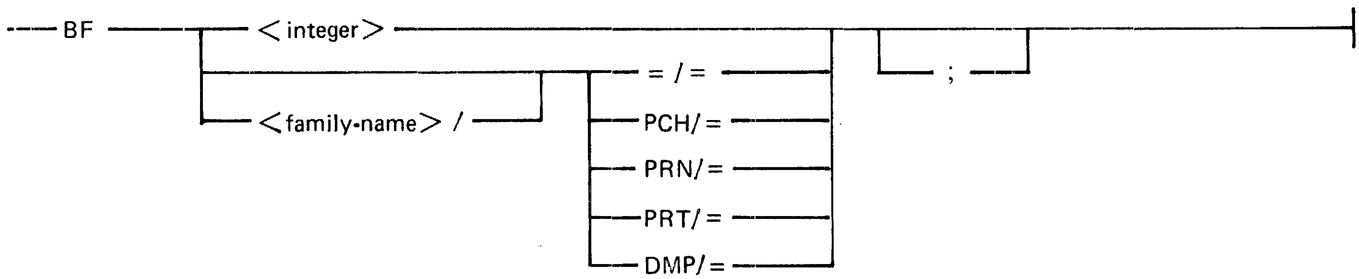
Command	Response
BB	PBD BLOCKS PER AREA = 200.
BB 350	# PBD BLOCKS.AREA CHANGED TO 350.

BF (Backup Files)

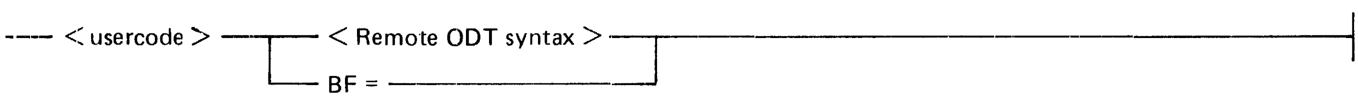
The BF system command lists disk backup files and dump files on the ODT. Entering BF PRT/=, BF PCH/=, and BF DMP/= causes all printer backup, punch backup, and dump files on disk, respectively, to be listed, for both the appropriate default disk and, if different, the system disk.

If the USER command does not precede the BF system command, the backup printer files listed have the name BACKUP/PRT<integer>, the backup punch files listed have the name BACKUP/PCH<integer>, and the dump files listed have the name DUMPFILE/<integer>. These names are MCP-generated, default names. If the USER command precedes the BF system command, the MCP uses the usercode supplied and lists the printer backup and punch backup files with the MCP-generated, default names of <usercode>/PRT<integer> and <usercode>/PCH<integer>, respectively. If a default disk identifier for the usercode is not the SYSTEM disk, then that user disk is searched for the backup printer and punch files.

Remote ODT syntax:



Workstation syntax:



Semantics:

DMP/=
The DMP/= keysymbol causes the dump files with the MCP-generated default name of DUMPFILE/<integer> to be displayed.

PCH/=
The PCH/= keysymbol causes the backup punch files with the MCP-generated default name of BACKUP/PCH<integer> to be displayed.

PRN/=
The PRN/= keysymbol causes the backup printer files with the MCP-generated default name of BACKUP/PRT<integer> to be displayed.

PRT/=
The PRT/= keysymbol causes the backup printer files with the MCP-generated default name of BACKUP/PRT<integer> to be displayed.

<integer>
This field, which must be a 4-digit integer, specifies the backup number of the backup file.

<family-name>
This field, which must contain a disk identifier, specifies the name of the user disk on which the backup file is located.

=/=
The =/= keysymbol causes the backup printer, backup punch, and dump files with the MCP-generated default names of BACKUP/PRT<integer>, BACKUP/PCH<integer>, and DUMPFILE/<integer> to be displayed.

=
The = keysymbol in the workstation syntax causes all printer backup, punch backup, and dump files associated with usercode to be displayed.

Examples:

Command	**Response**
BF =/=	BF= DUMPPACK/BACKUP/PRT9176 BF= DUMPPACK/BACKUP/PRT9260 BF= DISK/BACKUP/PRT9277 BF= DLPACK/BACKUP/PCH9355 BF= DLPACK/BACKUP/PCH9360 BF= DLPACK/BACKUP/PCH9362 BF= DUMPPACK/DUMPFILE/9300 BF= DUMPPACK/DUMPFILE/9417 BF= DUMPPACK/DUMPFILE/9477 END "BF".
BF PRT/=	BF= DLPACK/BACKUP/PRT9176 BF= DLPACK/BACKUP/PRT9260 BF= DISK/BACKUP/PRT9277 END "BF".
BF PCH/=	BF= DLPACK/BACKUP/PCH9355 BF= DLPACK/BACKUP/PCH9360 BF= DLPACK/BACKUP/PCH9362 END "BF".
BF DMP/=	BF= DUMPPACK/DUMPFILE/9300 BF= DUMPPACK/DUMPFILE/9417 BF= DUMPPACK/DUMPFILE/9477 END "BF".
BF USER/PRT/=	BF= USER/BACKUP/PRT0020 BF= USER/BACKUP/PRT0100 BF= USER/BACKUP/PRT0277 END "BF".
BF PRT/9176	BF= DISK/BACKUP/PRT9176 END "BF".
USER A/B BF =/=;	BF= USERPACK/(A)/PRT1276 BF= USERPACK/(A)/PCH2789 END "BF".

BR (Backup Reset)

The BR system command resets the next backup or dump file numbers to a given integer. Use of this command avoids the awkwardness operators find in dealing with the quite-large numbers that accrue when a system has run for months or years without coldstarting.

Syntax:

```
—— BR ——┬———————————————┬——————————————————————————————————————————|
        └—— < integer > ——┘
```

Semantics:

<integer>

This field may range from zero to one million, and specifies the numbers to be used for the next backup or dumpfile. If zero is specified, a value of one is used. If <integer> is not specified, the system restores the next backup/dump number to one.

Pragmatics:

BR is valid only from the ODT.

Example:

Command	Response
BR1	NEXT BACK FILE CHANGED FROM 8570 TO 1.
BR 1000	NEXT BACK FILE CHANGED FROM 3 TO 1000.

CC (Control Card)

The CC system command specifies that the system command immediately following it is to use the Control Card syntax. For more information, refer to the WFL System Command or the WFL System Option.

Remote ODT syntax:

```
—— CC ——————————————————————————————————————————|
```

Example:

Command	Response
CC CHANGE A/B/C TO A/B/X	A/B/C CHANGED TO A/B/X END CHANGE.
CC REMOVE A/B/X	A/B/X REMOVED END REMOVES.

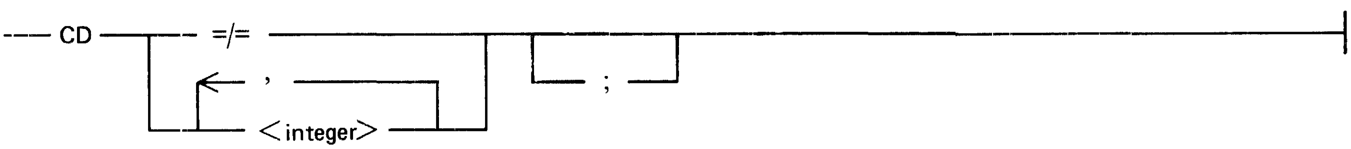
CD (Control Decks)

The CD system command lists the pseudo card files and their file numbers that have been previously placed on disk, normally by the SYSTEM/LDCONTRL program.

The MCP displays the number of each pseudo card file and the first 50 characters of the first card in the deck.

If a psuedo card file is in use, its name and the program using it is displayed.

Syntax:



Semantics:

=/=
: The =/= keysymbol causes the MCP to display all the pseudo card files.

<integer>
: This field, which must contain an integer in the range 0 to 16,777,215 inclusive, causes the MCP to search and display the pseudo card file with the name DECK/<integer>.

Examples:

Command	Response
CD =/=	DECK #1 = ?QU SMCS/MCPQ J 0022 LS SZ 000005
	DECK #2 = ?COPY AND COMPARE =/=

CH (Change)

The CHANGE system command causes the operating system to change the name of <file-identifier> of specified disk files to another name. If the file name reference resides on a user disk, the disk identifier must be included in <file-identifier>.

If the CHANGE system command is entered and the MCP cannot locate the file, the following message is displayed.

"<file-identifier>" NOT CHANGED — NOT ON DISK

If the CHANGE system command is entered and the file is currently opened by another program, the following message is displayed.

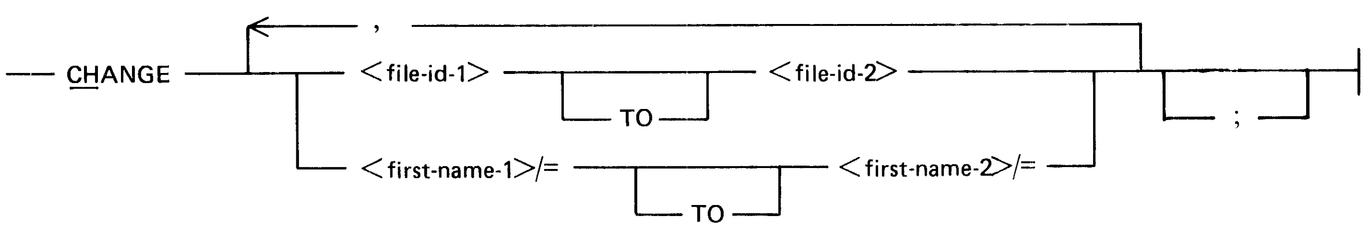
"<file-identifier>" NOT CHANGED — IN USE

The CHANGE system command is invalid for multipack files.

If <file-identifier> is a PRIVATE file, the CHANGE system command must be prefixed with the USER system command with the proper usercode/password combination.

NOTE
If the WFL system option is set, the following syntax is not valid for an unabbreviated CHANGE system command. The WFL syntax is used instead. Refer to the *B 1000 Systems Work Flow Language (WFL) Language Manual* for a description of the WFL syntax.

Remote ODT syntax:



Workstation syntax:

Semantics:

<first-name-1>
: This field, which must contain a valid first name, specifies that the current first name is to be changed. <first-name-1> is changed to <first-name-2> if there are no files on disk with <first-name-2> and none of the files with <first-name-1> are system files or are in use.

<first-name-2>
: This field, which must contain a valid first name, specifies the new first name. <first-name-1> is changed to <first-name-2> if there are no files on disk with <first-name-2> and none of the files with <first-name-1> are system files or are in use.

<file-id-1>
This field, which must contain a valid file identifier, specifies the name of the file to be changed.

<file-id-2>
This field, which must contain a valid file identifier, specifies the new name for the file.

Examples:

Command	Response
CHANGE A/B TO C/D;	"A/B" CHANGED TO "C/D"
CH A/B C/D, X Y;	"A/B" CHANGED TO "C/D" "X" CHANGED TO "Y"
CH (FINANCE)/CHECKREG TO (FINANCE)/CHECKS;	"(FINANCE)/CHECKREG" NOT CHANGED — SECURITY ERROR
USER FINANCE/VP CH CHECKREG TO CHECKS;	"CHECKREG" CHANGED TO "CHECKS"
CH MASTER/= OLD_MASTER/=	"MASTER/=" CHANGED TO "OLD_MASTER/= (4 FILES)
CH WORK/WORK_FILE/= TO WORK/OLD_WORK/=	"WORK/WORK_FILE/=" CHANGED TO "WORK/OLD_WORK/=" (6 FILES)
CH DEVELOP/MASTER/SOURCE TO PRODUCTION/SOURCE/	"INVALID CHANGES — PACK ID-S DO NOT AGREE ON DEVELOP/MASTER/SOURCE"

CL (Clear Unit)

The CL system command clears a unit on the system because of an apparent system software loop or hardware malfunction. Any program using a unit cleared by the CL system command is discontinued (DS-ed).

The CL system command can be used to make available a card reader device that has been saved (SV system command) for a particular task.

The CL system command cannot be used with disk devices (for example, DCx, DKx, or DPx).

The CL system command is not to be used to discontinue a program that is accessing the specified device.

Remote ODT syntax:

```
—— CL <unit-mnemonic> ——————————————————————————————————————————————|
```

Semantics:

<unit-mnemonic>
This field must contain a valid unit mnemonic on the B 1000 computer system except the unit mnemonics DCx, DKx, DPx, and FDx.

Examples:

Command	Response
CL LPA	LPA CLEARED
CL MTB	MTB CLEARED

CM (Change MCP)

The CM system command designates programs or the (SYSTEM)/USERCODE file as system software with specific functions; for example, as a new MCP or network controller program. This is accomplished by placing the file identifier of the file into an entry in the Name Table on disk. The Name Table is the directory of all operating system software to be used by the CLEAR/START program and other system functions. Each entry in the Name Table implies a specific function for each entered file.

For some files, the actual change resulting from a CM system command is delayed until the following CLEAR/START operation. For example, if a new MCP code file is placed into the M entry of the Name Table, it is loaded during the next CLEAR/START operation. If a new network controller program is designated, it is executed by the MCP whenever the currently-running network controller goes to end of job (EOJ) and a program opens a file with a device type equal to REMOTE.

No file having a usercode as a first name can be placed in the Name Table using the CM system command, except in the US slot, which only allows (SYSTEM)/USERCODE. Only the BNA entry can be on a user pack.

The PURGE option removes the file from the designated Name Table entry.

The SYSTEM/PANDA (PAN), SYSTEM/COPY (CPY), and network controller (C) name table entries cannot be purged. They can only be replaced. Similarly, the current-active N, G, I, MM, M, and ODT entries can only be replaced, not purged.

Refer to the CLEAR/START procedure in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a list of the valid software mnemonics that are used in the Name Table.

Remote ODT syntax:

```
── CM <software-mnemonic> ──┬── <file-identifier> ──┬──┬─────┬──────────────┤
                            └── PURGE ──────────────┘  └─ ; ─┘
```

Semantics:

<software-mnemonic>
: This field can contain any valid software mnemonic listed under the CLEAR/START program in the *B 1000 Systems System Software Operation Guide, Volume 2.* These mnemonics represent a slot in the Name Table for a system program.

<file-identifier>
: This field can contain any valid file identifier and specifies the name of a system program that is to be placed in the Name Table. The PANDA program name table entry must be on system disk.

PURGE
: The PURGE keyword is used to remove a file from the designated Name Table slot.

Examples:

Command	Response
CM MX MCPII/OLD;	CLEAR/START REQUIRED TO REPLACE "MCPII" BY "MCPII/OLD" AS MX
CM CX NETCONT/OLD;	EXPERIMENTAL NETWORK CONTROLLER CHANGED FROM "CANDE/HANDLER" TO "NETCONT/OLD"
CM ODX SYSTEM/ODT1106	EXPERIMENTAL ODT CHANGED TO SYSTEM/ODT1106
CM IX PURGE	SDL2/INTERPOLD PURGED.
CM I PURGE	THE I SLOT (currently SDL2/INTERP3M) IS CURRENTLY ACTIVE AND MAY NOT BE PURGED.

COPY (Copy)

The COPY system command executes the SYSTEM/COPY program. Refer to the SYSTEM/COPY program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the COPY system command.

CP (Compute)

The CP system command performs simple arithmetic operations and decimal/hexadecimal conversion on user-input expressions. Parentheses character can be used to logically group and to nest items within the expression. A special operand "X" can be used to recall the result of the previous CP system command.

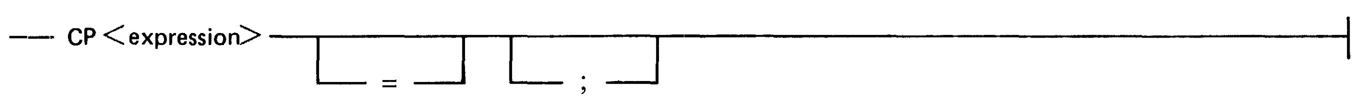
The following are the valid operators recognized by the CP system command.

Operator Mnemonic	Operation
+	Addition
–	Subtraction
*	Multiplication
/	Division
MOD or M	Modulus (remainder after integer division)

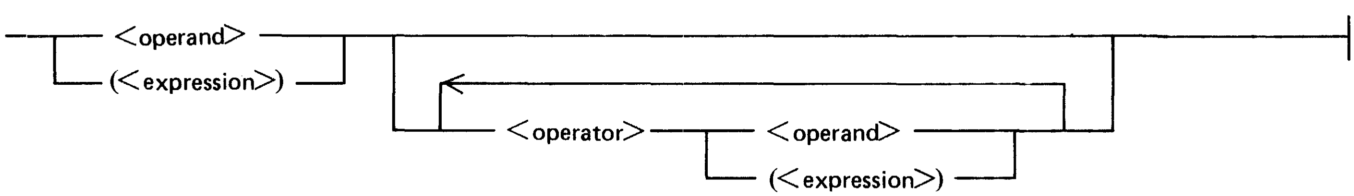
Expressions within parentheses have the highest precedence. The multiplication, division, and modulus operators are at a lower level of precedence. The addition and subtraction operators are at the lowest level of precedence. Operators of equal precedence are evaluated from left to right.

Operands delimited by double quotation mark (") characters are considered EBCDIC data. All other operands and all intermediate results are considered positive integers. Overflow beyond 16,777,215 is truncated. Spaces are required to separate arithmetic operators from the at sign (@) character, which delimits bit strings. Spaces are also required to separate the M operator from any operand.

Syntax:

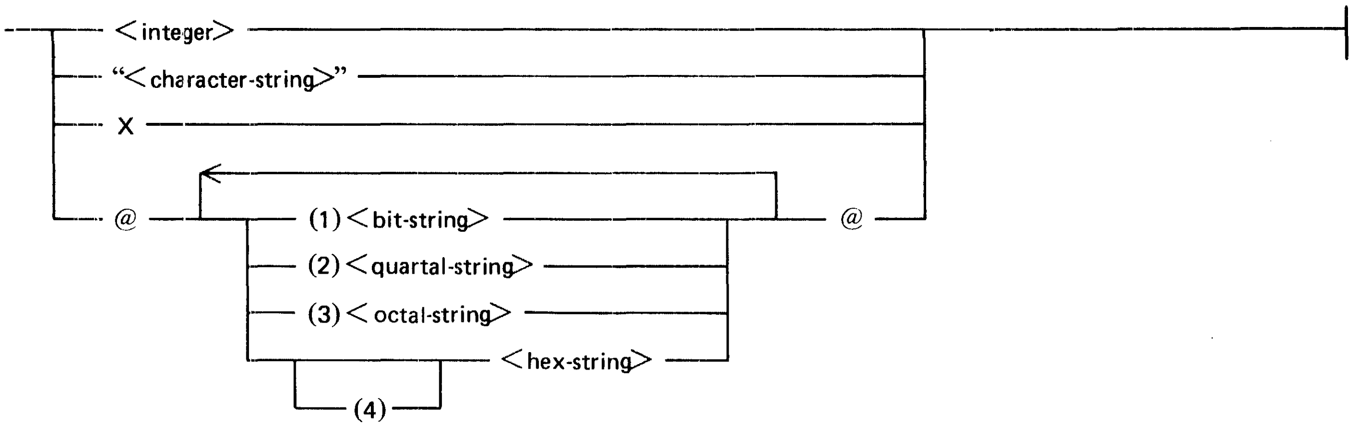


The following is the syntax for <expression>:

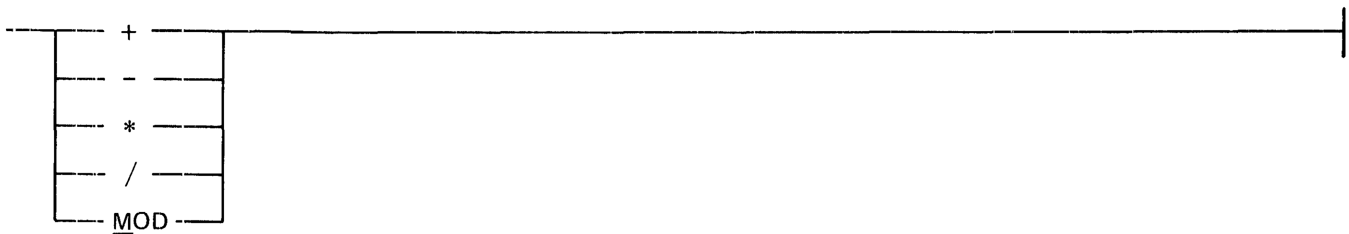


The appearance of <expression> within parentheses indicates that an expression can be used as an operand in a larger expression. This also allows for nesting of parentheses in the expression.

The following is the syntax for an <operand>:



The following is the syntax for an <operator>:



Semantics:

<bit-string>
This field must contain any bit string of zeros (0) and ones (1).

<character-string>
This field must contain an EBCDIC character string.

<hex-string>
This field must contain a hexadecimal number.

<integer>
This field must contain an integer in the range 0 to 16,777,215 inclusive.

<octal-string>
This field must contain an octal string.

<quartal-string>
This field must contain a quartal string.

X
The keysymbol X is a special operand which is used to recall the result of the previous CP system command.

+, −, *, /, MOD
The +, −, *, /, and MOD keysymbols cause either the addition, subtraction, multiplication, division, or modulus operation to be performed on the operands. The keysymbol − must not be immediately preceded by a letter or a digit. It must be preceded by a space or a special character.

(1), (2), (3), (4)
The (1), (2), (3), and (4) keysymbols specify that a bit, quartal, octal, or hexadecimal string, respectively, immediately follows.

=
The = keysymbol terminates the arithmetic operation.

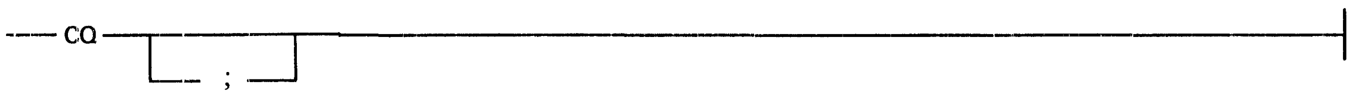
Examples:

Command	Response
CP @3A@ *4+ @F@	CP: @0000F7@ (247).
CP @F@	CP: @00000F@ (15).
CP X	CP: @00000F@ (15).
CP ((X MOD 8) − 4) * @1A@	CP: @00004E@ (78).
CP @1A@ *4+ @(3)17@ M 16 =	CP: @000077@ (119).
CP 84	CP: @000054@ (84).
CP @F(3)7(1)11111(2)33(4)F0@ +15	CP: @FFFFFF@ (16777215).
CP "*"	CP: @00005C@ (92)

CQ (Clear Queue)

The CQ system command causes all messages stored in the ODT queue to be cleared, and the ODT screen to be refreshed to its latest display state. CQ is valid only from the ODT.

Remote ODT syntax:



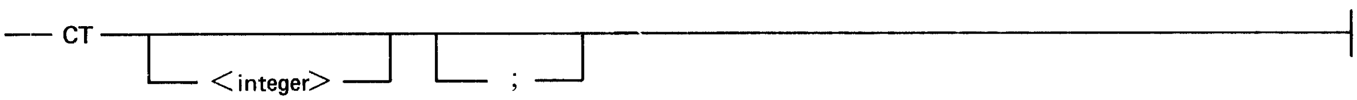
CT (Correctable Error Table)

The CT system command interrogates or changes the size of the table maintained in memory by the MCP and GISMO for logging memory errors. This table exists only on systems with error-correcting memories. On systems without error-correcting memories, the CT system command has no effect.

Entering the CT system command without specifying <integer> causes the MCP to display the current size of the table, as well as the size to be used at the next CLEAR/START operation.

Any change in the table size takes effect when the next CLEAR/START operation is performed.

Remote ODT syntax:



Semantics:

<integer>
This field, which must contain any integer in the range 0 to 255 inclusive, specifies the number of entries to allocate to the table. Each entry requires four bytes of memory. If <integer> equals 0, the number of entries defaults to one for every 32K bytes of main memory on the system. If <integer> is greater than 255, the table size is set to 255 entries.

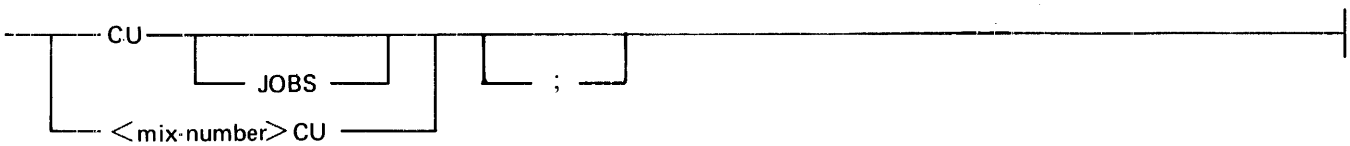
Examples:

Command	Response
CT	32 SPACES IN CORRECTABLE MEMORY ERROR TABLE. WILL BE DEFAULT (1 PER 32K BYTES) SPACES AFTER NEXT CLEAR/START
CT 20;	32 SPACES IN CORRECTABLE MEMORY ERROR TABLE. WILL BE 20 SPACES AFTER NEXT CLEAR/START
CT 0	20 SPACES IN CORRECTABLE MEMORY ERROR TABLE. WILL BE DEFAULT (1 PER 32K BYTES) SPACES AFTER NEXT CLEAR/START

CU (Core Usage)

The CU system command displays the amounts of save and overlayable memory in use by a program or displays system totals and the core usage for all programs in the mix. If a <mix-number> is specified, the amount of save and overlayable memory (in bytes) in use by a program is displayed. If a <mix-number> is not specified, the system totals and core usage for all programs in the mix are displayed. The JOBS keyword causes information about each running task to be included in the display, as if each <mix-number> were requested. If the DBUG MCP option is set, an analysis of linked memory, certain run structure fields, total usercode space, and size and location of user files are also displayed.

Syntax:



Semantics:

<mix-number>

This field must contain a mix number of a currently executing program. If <mix-number> is not specified, the system totals and the core usage for all programs in the mix are displayed.

JOBS

The JOBS keyword causes information about each running task to be included in the display, as if each <mix-number> were requested.

NOTE

Using the JOBS keyword in a CU system command when the DBUG MCP option is set results in very lengthy output because a memory analysis of each running task is displayed.

Examples with the DBUG MCP option reset:

Command	**Response**
CU	MEMORY USAGE AT 08:18:06.1 SAVE= 167708 BYTES LARGEST OVERLAYABLE= 616513 BYTES AVAILABLE MEMORY: 204923 BYTES; LARGEST AVAILABLE CHUNK: 53627 BYTES. END CU
CU JOBS	MEMORY USAGE AT 08:18:13.5 SAVE= 167708 BYTES LARGEST OVERLAYABLE= 616513 BYTES AVAILABLE MEMORY: 204823 BYTES; LARGEST AVAILABLE CHUNK: 53627 BYTES. SAVE= 11535 BYTES; OVERLAYABLE= 15254 BYTES. SAVE= 54623 BYTES; OVERLAYABLE= 61424 BYTES. SAVE= 1841 BYTES; OVERLAYABLE= 54745 BYTES (ROLLED OUT). SAVE= 39157 BYTES; OVERLAYABLE= 72842 BYTES. SAVE= 1403 BYTES; OVERLAYABLE= 80604 BYTES (ROLLED OUT). END CU

Command	Response
234CU	<task-name> =<mix #> SAVE= 1841 BYTES; OVERLAYABLE= 54745 BYTES (ROLLED OUT). END CU

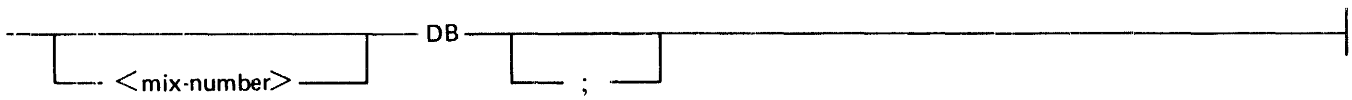
Examples with the DBUG MCP option set:

Command	Response
CU	MEMORY USAGE AT 08:15:54.4 SAVE= 165060 BYTES LARGEST OVERLAYABLE= 616513 BYTES WITHIN LINKED MEMORY: IN USE= 811397 BYTES OVERLAYABLE= 883515 BYTES AVAIL= 208495 BYTES LARGEST AVAIL= 53627 BYTES SAVE SPACE= 136377 BYTES LINKED MEMORY= 1019892 BYTES FIRST LINK= @026ECA@ LAST LINK= @7EEE70@ FENCE= @059539@ NUMBER OF LINKS= 583
234CU	#= 234 , PP=13, MP=13 ROLLED OUT RS.Q.IDENT=WATE.Q; RS_NEXT_Q=READY.Q RS.STATUS = 20 ENVIRONMENT #0 (PRIMARY)(CURRENT) P=0,S=11,D=5208 LOCAL DATA SIZE = 36321 BYTES(ROLLED OUT) NUCLEUS ADDRESS = @74BE1E@, DISPLACED = 81677 BYTES CODE OVERLAY COUNT = 86 DATA OVERLAY COUNT = 2 CODE SPACE= 54784 BYTES FILES= 16 0 AT @6F1EC6@, SIZE = 317 BYTES. 1 AT @74FD04@, SIZE = 151 BYTES. 4 AT @6F0D87@, SIZE = 114 BYTES. 5 AT @6F1119@, SIZE = 114 BYTES. 6 AT @6F14AB@, SIZE = 114 BYTES. 7 AT @6F0274@, SIZE = 151 BYTES. TOTAL FILE SPACE= 7699 BYTES SAVE= 1841 BYTES; OVERLAYABLE= 54745 BYTES (ROLLED OUT). END CU

DB (Data Bases)

The DB system command displays all the active DMSII data bases. If the mix number of a DMSII program is specified, the name of the data base, number of update operations, number of non-update operations, and total run time are displayed.

Syntax:



Semantics:

<mix-number>
This field must contain a mix number of a DMSII program that is currently executing. If <mix-number> is not specified, a list of all the active DMSII data bases is displayed.

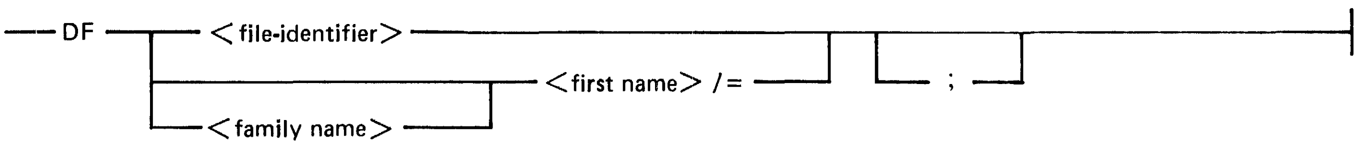
Examples:

Command	Response
DB	NO ACTIVE DATA BASES
DB	FCFDB ON LINE - 6 USERS, 3 ACTIVE UPDATE USERS
1998DB	(NEWDB) (NEWDB)/TRPROGRAMO ON DBPACK = 1998 SZ= 12 DATA BASE OPS, 140 NON-UPDATE OPS, 5 EXCEPTIONS IN 00:06:11.7
6800DB	(LINC) FCF =6800 DATABASE FCFDB ON LINC ACTIVE --- 22 TRANSACTIONS, 104 UPDATE OPS, 759 NON-UPDATE OPS, 71 EXCEPTIONS IN 60:00:25.2 (IN TRANSACTION STATE)

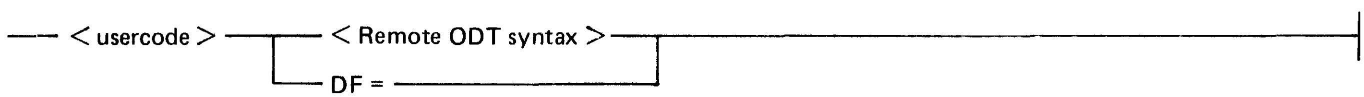
DF (Date of File)

The DF system command displays the compilation date and time for code and interpreter files, and the creation date, time, update date if applicable, and end-of-file (EOF) pointer for all other types of files. The file capacity is included for files of type DATA.

Remote ODT syntax:



Workstation syntax:



Semantics:

<family-name>
: This field, which must contain a valid disk identifier, specifies the name of the user disk to be searched for the files.

<first-name>
: This field, which must contain a valid first name, specifies the first part of a file name.

<file-identifier>
: Refer to Section 1 of this guide for a description of file-identifier.

=
: The = keysymbol in the workstation syntax causes the file information for all of the files associated with <usercode> to be displayed.

Examples:

Command	Response
DF DMPALL;	DMPALL COMPILED ON 11/25/86 AT 13:39:17.6
DF USER/DATA/FILE;	USER/DATA/FILE CREATED 01/07/86 AT 09:35:06.4, UPDATED ON 09/30/86, EOF=225, CAPACITY=300 RECORDS
DF MASTER/=	MASTER/FILE CREATED ON 12/30/86 AT 10:45:07.3 MASTER/LIST CREATED ON 12/30/86 AT 11:52:08.1

DIR (Directory)

The DIR system command executes the SYSTEM/COPY program. Refer to the SYSTEM/COPY program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the DIR system command.

DL (Disk Location)

The DL system command designates the system default pack for backup files and dump files.

When the DL command is entered with no following phrase, the operating system displays the setting of all the DL types.

When the DL command is entered with a DL type but without a "ON <familyname>" phrase, the setting of that DL type is displayed.

When the DL command is entered with a DL type and a "ON <familyname>" phrase, the setting of that DL type is changed to the specified <familyname>. The <familyname> pack must be online when the DL command is entered. If it is not, a message is displayed and the command is ignored.

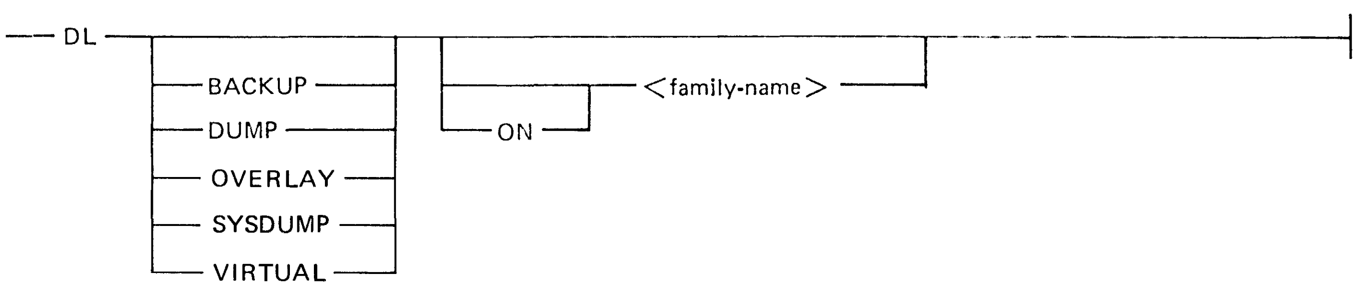
An attempt to power off a pack that is the object of a DL system command results in an error message and the power off command is ignored.

If, at CLEAR/START, a pack that is the object of a DL command is not present, the system displays a message warning the operator that a DL pack is missing.

If a program opens a backup file and the DL BACKUP pack is missing, the program is hung waiting for the missing pack.

If a program dump is requested (<mix#> DP or <mix#> DM) and the DL DUMP pack is missing, a message is displayed and the dumpfile directed to the system disk.

Remote ODT syntax:



Semantics:

BACKUP
: The BACKUP keyword refers to the system default pack for printer and punch backup files.

DUMP
: The DUMP keyword refers to the system default pack for program dump files. The system dump file initially resides on the system disk.

OVERLAY
: The OVERLAY keyword refers to the system default pack to which data overlays for jobs using dynamic memory are directed.

SYSDUMP
: The SYSDUMP keyword indicates the family name on which SYSTEM/DUMPFILE, used for system memory dumps, resides. The DUMP option must be reset (via RO DUMP) in order to change this designation.

VIRTUAL
The VIRTUAL keyword has the same function as the OVERLAY keyword.

<family-name>
This field must contain a disk identifier and specify the name of the default disk for the appropriate DL type. A <family-name> of DISK refers to the system disk.

Examples:

Command	Response
DL	DL : BACKUP DESIGNATION = MISC DUMP DESIGNATION = SYSTEM DISK SYSDUMP DESIGNATION = BLUE
DL BACKUP	DL BACKUP DESIGNATION = A
DL BACKUP ON X	DL BACKUP DESIGNATION CHANGED FROM A TO X
DL DUMP ON DISK	DL DUMP DESIGNATION NOT CHANGED ... ALREADY ON DISK
DL SYSDUMP BARAR3	DL SYSDUMP DESIGNATION CHANGED FROM DISK TO BARAR3
DL OVERLAY MISC	DL OVERLAY DESIGNATION CHANGED FROM DISK TO MISC

DM (Dump Memory)

The DM system command dumps the contents of the memory space of a program to disk for subsequent analysis by the SYSTEM/IDA program. Processing of the program automatically continues after the memory space of the program is written to disk. If the DMPL (Dumpfile Lock) option is set, the DM system command causes a push-through system halt.

When preceded by a mix number, the DM system command creates a file called DUMPFILE/<integer> on the disk specified by the DL DUMP system command. <integer> is incremented by 1 each time a DM system command is performed to make each dump file unique.

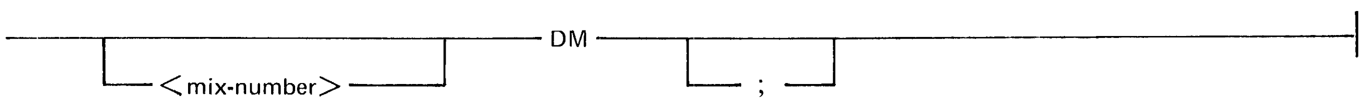
If the program is executed with a usercode/password, the name of the dump file is created with the following format:

<default-family-name>/(<usercode>)/DMP<integer>

The resulting dump file can be analyzed and printed by the SYSTEM/IDA program. Refer to the PM system command for more information.

If no <mix-number> is specified, and the DBUG system option is set, the memory of the entire system is written to a disk file named SYSTEM/DUMPFILE on the DL SYSDUMP pack. A <mix-number> of zero accomplishes the same thing whether or not the DBUG system option is set.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number>
: This field, which must contain a mix number of a program that is currently executing on the system, specifies the program for which the program memory dump is desired. If <mix-number> is not specified, the memory of the entire system is written to a disk file on the DL SYSDUMP pack named SYSTEM/DUMPFILE.

Examples:

Command	**Response**
DM	SYSTEM MEMORY DUMP COMPLETE
23DM	*DMPALL ON DISK =23 DUMPFILE/10
USER A/B 4531DM	(A) *DMPALL ON DISK =4531 DUMPFILE IS USERPACK/(A)/DMP1014

DP (Dump Program)

The DP system command halts program execution, writes the memory space of the program to disk, and discontinues the program.

Remote ODT syntax:

```
--- <mix-number> DP --+-----+-----------------------------------|
                      |     |
                      +- ; -+
```

Workstation syntax:

```
--- <usercode><remote ODT syntax> ------------------------------|
```

Semantics:

<mix-number>

This field, which must contain a mix number of a program that is currently executing on the system, specifies the program for which the program memory dump and discontinuation is desired.

Example:

Command	Response
267DP;	*DMPALL ON DISK =267 DUMPFILE/144 *DMPALL ON DISK =267 DS-ED. TIME = 11:27:37.1
USER A/B 4150DP	(A) *DMPALL ON DISK =4150 DUMPFILE IS USERPACK/(A) USERPACK/(A)/DMP1019 (A) *DMPALL ON DISK =4150 DS-ED. TIME = 12:01:38.

DQ (Default Queue)

The DQ command assigns a specific job queue as the default job queue, meaning the queue through which jobs are scheduled that do not specify a CLASS program attribute. Upon a coldstart operation, job queue 0, the only queue to initially exist, is the system default queue. A default job queue need not exist; if it is cancelled the system attempts to use the highest-number job queue whose limits are not exceeded by the job.

Syntax:

Semantics:

DQ
: Displays the current default job queue.

DQ <number>
: Assigns queue #<number> as the new default job queue.

DQ -
: Voids the current default job queue.

Examples:

Command	Response
DQ 5	DEFAULT JOB QUEUE CHANGED FROM 0 TO 5
DQ	DEFAULT JOB QUEUE = 5
DQ -	DEFAULT JOB QUEUE CANCELLED

DR (Date Reset)

The DR system command changes the current date maintained by the MCP. The DR system command functions identically to the DT system command. For inquiry about the current date and time, the TD system command is used. Refer to the TD system command for more information.

The MCP accepts only valid dates. The month entry must be between 1 and 12, the day must be between 1 and 31, and the year must be valid numeric digits. An invalid date or alphabetic input produces an error message.

Remote ODT syntax:

```
--- DR <mm>/<dd>/<yy> --+-----+-------------------------------|
                        |     |
                        +- ; -+
```

Semantics:

<mm>/<dd>/<yy>
: This field must contain a valid date, where mm is a 1- or 2-digit month number, dd is a 1-digit or 2-digit day number, and yy is the last two digits of the year.

Example:

Command	Response
DR 7/25/86	DATE = 7/25/86 FRIDAY (JULIAN DATE = 86207)

DS (Discontinue)

The DS system command discontinues the execution of a program.

The DS system command can be entered at any time after the program reaches beginning of job (BOJ) and prior to end of job (EOJ).

The DS system command terminates the execution of the program and returns memory occupied by the program to the system. Any files not previously entered into the disk directory are lost and the disk area occupied is returned to the disk available table. All other files are closed.

Remote ODT syntax:

```
— <mix-number> DS ─┬──────┬──────────────────────────────┤
                   └─ ; ──┘
```

Workstation syntax:

```
— <usercode><remote ODT syntax> ─────────────────────────┤
```

Semantics:

<mix-number>
This field, which must contain a mix number of an executing program, specifies the program to be discontinued.

Example:

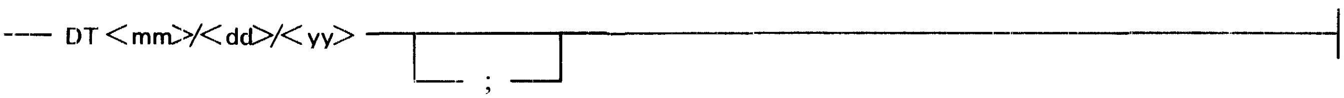
Command	Response
271DS	*DMPALL ON DISK =271 DS-ED. TIME = 11:43:47.4

DT (Date Change)

The DT system command changes the current date maintained by the MCP. The DT system command functions identically to the DR system command. For inquiry about the current date and time, the TD system command is used. Refer to the TD system command for more information.

The MCP accepts only valid dates. The month entry must be between 1 and 12, the day must be between 1 and 31, and the year must be valid numeric digits. An invalid date or alphabetic input produces an error message.

Remote ODT syntax:



Semantics:

<mm>/<dd>/<yy>
: This field, which must contain a valid date, where mm is a 1- or 2-digit month number, dd is a 1-digit or 2-digit day number, and yy is the last two digits of the year.

Example:

Command	Response
DT 7/25/86	DATE = 7/25/86 FRIDAY (JULIAN DATE = 86207)

ED (Eliminate Deck)

The ED system command removes a pseudo-reader file from a pseudo reader and the disk directory.

Remote ODT syntax:

Semantics:

<integer>
This field specifies the pseudo-deck number to be eliminated.

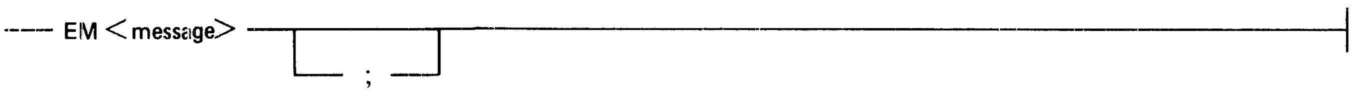
Example:

ED 2;

EM (ELOG Message)

The EM system command writes a message into the (engineer's) log) SYSTEM/ELOG file.

Remote ODT syntax:



Semantics:

<message>
This field contains a message that is to be written in the SYSTEM/ELOG file.

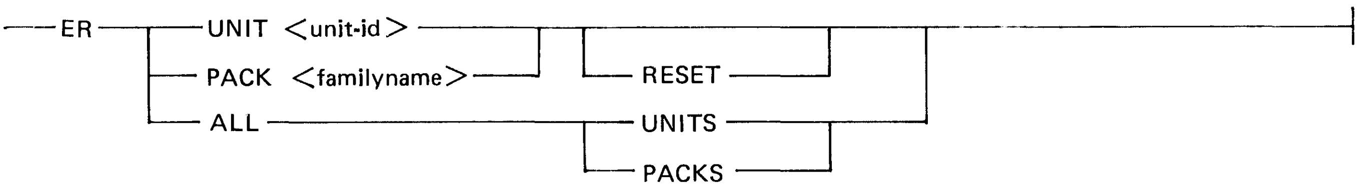
Example:

EM COLUMNS 121 & 122 ARE NOT PRINTING ON LPA

ER (Error Rate)

The ER system command provides error rates for disk units and for removable disk packs. The operator can determine the current rate of I/O errors on a given pack or unit by using the RESET option to zero the counts and then checking the counts over a finite time span after the reset action.

Remote ODT syntax:



Semantics

UNIT

The UNIT <unit-id> keyword reports the total number of I/O operations and errors recorded for this unit since the last use of the RESET option. For removable disk drives, this includes all the errors recorded for all the packs that have been mounted on this unit.

PACK

The PACK <family-name> keyword reports the total number of I/O operations and errors recorded for this pack since it was last initialized or since the last use of the RESET option.

ALL

The ALL keyword reports for all units or packs on the system.

RESET

The RESET keyword resets the I/O operation and error counts for this unit or pack. This option should be used by a Burroughs Field Engineer only.

Examples:

```
ER UNIT DPA
 UNIT DPA:- 1000000 OPERATIONS WITH 100 ERRORS SINCE LAST RESET (6/1/86)
 UNIT DPA:- 10000 OPERATIONS WITH 90 ERRORS SINCE CLEAR/START OR LAST
            RESET (10:50.00.1 8/17/86)

ER PACK TWELVE
 PACK TWELVE #123456:- 100000 OPERATIONS WITH 5 ERRORS SINCE LAST RESET
                       (6/07/86)
 PACK TWELVE #123456:- 10000 OPERATIONS WITH 5 ERRORS SINCE POWER ON OR
                       LAST RESET (09:00:00.1 3/18/86)
```

ET (ELOG Transfer)

The ET system command transfers the information in the engineer's log file, SYSTEM/ELOG, to the ELOG/#<integer> file. The SYSTEM/ELOGOUT program is automatically executed to analyze and print the ELOG/#<integer> file.

Refer to the SYSTEM/ELOGOUT program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for more information.

Remote ODT syntax:

Example:

Command

ET

Response

ELOG TRANSFERRED TO ELOG/#00000167
*SYSTEM/ELOGOUT ON DISK =1697 BOJ. PP=4, MP=4, TIME = 10:04:06.4

.

.

.

FM (Forms Mounted)

The FM system command is a response to the SPECIAL FORMS REQUIRED message.

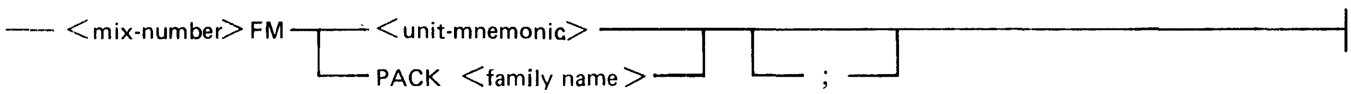
The unit mnemonic designates which unit is to be assigned to the file.

The following message is displayed, requiring that an FM system command be entered before the printer or punch file can be opened.

<program-name> = <mix-number> SPECIAL FORMS REQUIRED FOR <file-id>

If the FM system command specifies a backup device, tape or disk, a backup file is created.

Remote ODT syntax:



Semantics:

<mix-number>
This field must contain a mix number of a program that is suspended and waiting for an FM system command.

<unit-mnemonic>
This field, which must contain a valid line printer or punch device, specifies the unit on which the special forms are loaded.

PACK <family-name>
This PACK keyword specifies that a disk identifier follows instead of unit mnemonic.

Examples:

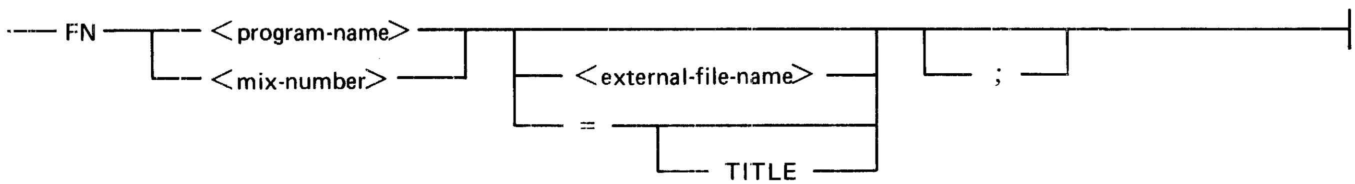
93 FM LPA

94 FM DPB

FN (File Names)

The FN system command displays the internal and external file names of an object program. The program can be currently executing, scheduled to be executed, or on disk. If the program is executing, the open status of each file is included.

Syntax:



Semantics:

<program-name>
: This field, which must contain a program name of a program that currently exists in the disk directory, specifies the name of the program from which to obtain the internal and external file names.

<mix-number>
: This field, which must contain a mix number of an executing or scheduled to be executed program, specifies the program from which to obtain the internal and external file names.

<external-file-name>
: This field, which must contain a valid external file name of a program, specifies the file for which the internal file name is to be obtained. If this field is not present, then all the file names in the program are displayed.

=
: The = keysymbol is required when the TITLE keyword is specified and in all other cases is optional.

TITLE
: The TITLE keyword causes the external file names to be displayed in title format. A file displayed in title format is in the form B/C ON A, where B is the first part of the file title, C is the second part of the file title, and A is the family name (or disk identifier).

Examples:

Command	Response
FN SYSTEM/MAKEUSER	FILE #0: NEWCODES= NEW/USERCODES FILE #1: LINE= LINE FILE #2: USERCODE= (SYSTEM)/USERCODE FILE #3: PUNCH= NEW/USER.CODES FILE #4: MIX_Q= MIX_Q
FN SYSTEM/MAKEUSER LINE	FN = "LINE"
FN 4587	FILE #0: LINE= LINE (OPEN OUTPUT) FILE #1: DUMMY= DUMMY (CLOSED) FILE #2: USER= USER (OPEN I/O) FILE #3: CARDS= CARDS (OPEN INPUT)
FN 123 = TITLE	FILE #0: HELP= TEST/HELP ON USERPACK (ROLLED OUT TO DISK; OPEN INPUT) FILE #1: LINE= LINE (OPEN OUTPUT)

FR (Final Reel)

The FR system command notifies the MCP that the last reel of an unlabeled tape file has completed processing, and there are no more input reels to be read.

The FR system command is a response to the following MCP message.

<program-name> <mix-number> FILE <internal-name> REEL #<integer> NOT PRESENT

This message is the result of an unlabeled tape file reaching the end of the reel and the FR system command notifying the program that the file has reached the end of the file.

The FR system command is also valid for labeled tape files, to signal the end of the file without reading all of the reels of the tape file.

The FR system command must be used with paper tape input files to signal the end of the file after all reels have been processed.

Remote ODT syntax:

```
---- <mix-number> FR ---+-------+---------------------------------------|
                        |       |
                        +-- ; --+
```

Workstation syntax:

```
---- <usercode><remote ODT syntax> ------------------------------------|
```

Semantics:

<mix-number>
: This field, which must contain a mix number of a program that is suspended and waiting for another reel of a multireel tape file, specifies a program that has read the last reel of the multireel tape file.

Examples:

MCP Message	Command
*DMPALL ON DISK =14 FILE INPFILE (UNLABELED) REEL #5 NOT PRESENT	14FR
*TAPE/PRINT ON DISK =33 FILE TAPE (LABELED "TAPFIL") REEL #2 NOT PRESENT	33FR;

FS (Force from Schedule)

The FS system command moves tasks from the waiting schedule into a job queue, or tasks from a job queue to the tasking schedule. Tasks that are moved from the job queue are executed immediately if system resources can be procured, ignoring system or job queue mix/limit restrictions.

Specifying the equal sign (=) character forces all tasks from the waiting schedule into the appropriate job queues.

The HS system command places a task into the waiting schedule.

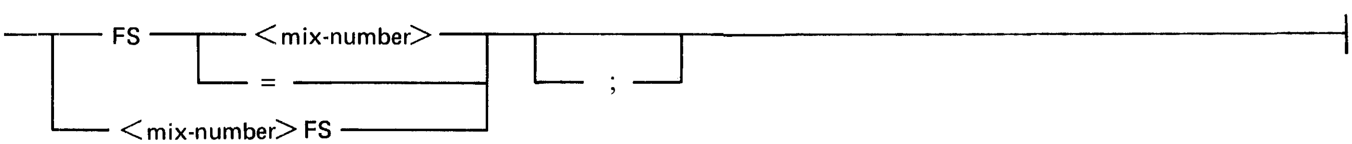
NOTE

The waiting schedule is a schedule of tasks that are waiting until the occurrence of some event to be placed into the active schedule. For example, an EXECUTE program control instruction used with the THEN or AFTER.NUMBER program control instructions places the second program in the waiting schedule.

The job queues consist of those tasks that have satisfied all the requirements for execution and are waiting only for system resources or to satisfy mixlimit criteria to run.

For a program to be in the mix, it must have reached beginning of job.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number>

This field, which must contain a mix number of a program currently in the waiting schedule, specifies the program to be placed in the active schedule.

=

The = keysymbol causes all tasks in the waiting schedule to be placed into the job queues.

Examples:

Command	Response
FS 239;	239 FS-ED
240FS;	240 FS-ED
FS =;	250 FS-ED 251 FS-ED

GO (Go)

The GO system command resumes program execution of a program that has been stopped by the ST system command.

Remote ODT syntax:

```
── <mix-number> GO ─┬─────┬────────────────────────────┤
                    └─ ; ─┘
```

Workstation syntax:

```
── <usercode><remote ODT syntax> ───────────────────────┤
```

Semantics:

<mix-number>
This field must contain a mix number of a program that is currently suspended by the ST system command.

Example:

Command	Response
123GO	*DMPALL ON DISK =123 RESUMED TIME = 12:01:34.7

HALT (Halt)

The HALT system command causes a B 1000 system to come to an orderly, push-through halt. Upon receipt of the HALT system command, the operating system updates the error-rate tables for all online disk drives and disk packs, makes an entry in the ELOG, and makes a request to GISMO to halt the system. GISMO waits until in process input and output operations are complete and then halts the system. Following the halt, the L register contains @000010@. Entering GO on the B 1990 console, or pressing the start button on non-B 1990 systems, causes the system to continue. The HALT system command is valid only from the system ODT.

System ODT syntax:

```
—— HALT ——————————————————————————————————————————————————————————————|
```

HI (Cause Exceptionevent)

The HI system command causes the EXCEPTIONEVENT of a running program to occur. If the optional <integer> is included in the message, that value is stored in the TASKVALUE task attribute of the program.

Remote ODT syntax:

```
--- < mix number > HI --┬-----------------┬--------------------------|
                        └- < integer > ---┘
```

Workstation syntax:

```
--- < USER command >< Remote ODT syntax > ----------------------------|
```

Semantics:

<mix number>
  This field must contain a mix number of a program currently in the mix. It specifies the target program for the EXCEPTIONEVENT.

<integer>
  Integer specifies the value to be placed in the TASKVALUE of the program.

Example:

Command	Response
2314HI	TEST/JOB =2314 EXCEPTIONEVENT CAUSED

HN (Hostname)

The HN system command modifies or queries the logical system hostname of the system. The hostname can be modified only when no tasks are running. If there are tasks running when an attempt is made to modify the hostname, the new value of hostname is saved and used at the next CLEAR/START operation or whenever there are no tasks running.

Specifying the HN system command without <hostname> causes the current hostname to be displayed.

Remote ODT syntax:

Semantics:

<hostname>
This field, which must contain a name of up to 17 characters, specifies the name of the local BNA host.

Examples:

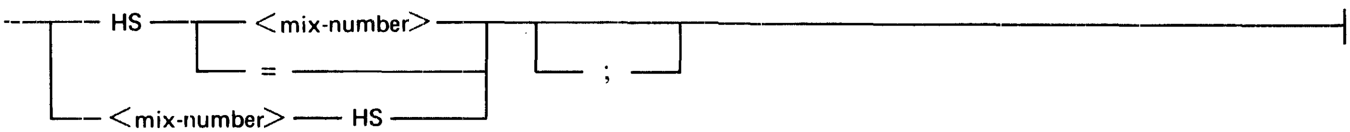
Command	Response
HN B1905;	NEXT NULL MIX OR CLEAR/START WILL USE HOSTNAME = "B1905"
HN;	HOSTNAME = "HOSTTEST", NEXT HOSTNAME "B1905"

HS (Hold Schedule)

The HS system command places a HOLD on a specific task or tasks, thereby temporarily removing them from the job queue or tasking schedule and placing them in the waiting schedule.

A task that has been placed in the waiting schedule by an HS system command remains in the waiting schedule until an FS system command restores the task or tasks to the job queue or tasking schedule.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number>

This field, which must contain a mix number of a program in the active schedule, specifies the program to be placed in the waiting schedule.

=

The = keysymbol removes all tasks in the active schedule and places them in the waiting schedule.

Examples:

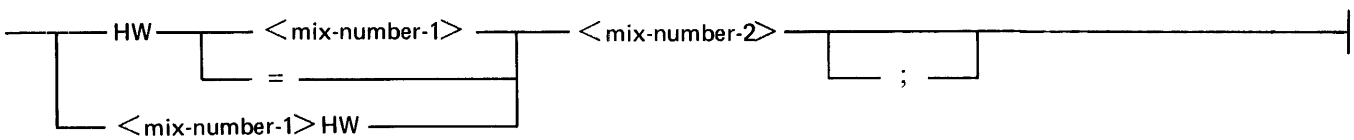
Command	Response
HS 112;	112 HS-ED
115 HS;	115 HS-ED
HS =;	120 HS-ED 121 HS-ED

HW (Hold and Wait)

The HW system command places tasks in the waiting schedule to await the end of another task.

A task that has been placed in the waiting schedule by an HW system command remains in the waiting schedule until the program with mix number equal to <mix-number-2> goes to end of task or until the FS system command is performed for the task.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number-1>
: This field, which must contain a mix number of a program in the active schedule, specifies the program that is to be placed in the waiting schedule.

<mix-number-2>
: This field, which must contain a mix number of a program in the mix, active schedule, or waiting schedule, specifies the task that must go to end of job before the tasks in the waiting schedule can be placed in the job queue or tasking schedule.

=
: The = keysymbol causes all tasks in all job queues and the tasking schedule to be placed into the waiting schedule until the program with mix number equal to <mix-number-2> goes to end of job.

Examples:

Command	Response
HW 190 183	190 HW-ED
200 HW 201	200 HW-ED
HW = 400	390 HW-ED 391 HW-ED

IB (Instruction Block)

The IB system command displays a requested instruction block for a WFL job.

If no <instruction number> is given with the IB system command, the most recently executed <INSTRUCTION statement> is displayed. If an <INSTRUCTION statement> has not been executed, a message is displayed indicating that fact.

The instruction block is displayed in the following format:

INSTRUCTION <instruction number>: text of instruction

Syntax:

```
—— <mix number> IB ——┬——————————————————————————┬——————————————————————————————┤
                     └— <instruction number> ———┘
```

Semantics:

<mix-number>
: This field, which must contain the mix number of a WFL job, specifies the target job for the instruction message.

<instruction-number>
: This field, which must contain an integer in the range of 1 to 63, specifies the number of the instruction to be displayed.

Examples:

```
2657IB 1

  JOB2657 =2657 INSTRUCTION 1: TESTTAPE IS IN TAPE RACK 3.

3945IB

  IB/JOB =3945 INSTRUCTION 7: IF T17 OR T17A WERE NOT COPIED
                          FROM TESTTAPE TO USERS, PLEASE DS THIS JOB
                          AND LEAVE JK A NOTE.
```

IC (Interpreter Count)

The IC system command interrogates or changes the number of entries allocated to the MCP Interpreter Dictionary.

The Interpreter Dictionary is a table maintained by the MCP that contains information concerning all active interpreters. One entry is required in this table for each interpreter running on the system, plus one entry each for the MICRO-MCP and GISMO interpreters. In addition, because the MCP is always active, one entry is reserved for the SDL2 interpreter. Each entry in the Interpreter Dictionary requires 28 bytes of non-overlayable memory space.

The Interpreter Dictionary is constructed and initialized during the CLEAR/START operation by the SYSTEM/INIT program, and contains the number of entries specified by <integer>. The default value following a coldstart operation is 7, implying that the maximum number of interpreters that can be active on the system at one time is four (because an entry is reserved for the MICRO-MCP, GISMO, and SDL2 interpreters).

The IC system command allows the Interpreter Dictionary size to be changed if it becomes necessary to increase or decrease the maximum number of active interpreters allowed.

No tasks can be in the mix or in either the waiting or active schedules when changing the interpreter count, and a CLEAR/START operation is required immediately after the IC system command is entered.

If the IC system command is entered without specifying <integer>, the MCP displays the current value of the interpreter count.

Remote ODT syntax:

Semantics:

<integer>
This field, which must contain an integer in the range 3 to 31 inclusive, specifies the number of entries to be allocated to the Interpreter Dictionary by the SYSTEM/INIT program during the next CLEAR/START operation.

Examples:

Command	Response
IC;	INTERPRETER COUNT = 7
IC 4;	CLEAR/START REQUIRED TO CHANGE INTERPRETER COUNT FROM 7 TO 4

IL (Ignore Label)

The IL system command causes the label to be ignored on the file mounted on the designated unit.

The IL system command can be used in response to the following MCP messages:

NO FILE <file-identifier>

DUPLICATE INPUT FILE <file-identifier>

<file-identifier> NOT IN DISK DIRECTORY

It is assumed that the system operator knows that the file on the unit selected is the correct file regardless of the original location of the file. If <unit-mnemonic> specifies a disk drive, the directory on that drive is searched for the required file identifier. Specifying #<integer> designates a pseudo-reader file (by number) as the input device.

An IL system command, which references a card reader device that has been reserved by mix number for a program, overrides the reservation and assigns the card reader device regardless of the file identifier requested.

Remote ODT syntax:

```
---- <mix-number> IL ---+-- <unit-mnemonic> --------+--+-------+---------------|
                        |                           |  |       |
                        +-- #<integer> -------------+  +-- ; --+
                        |                           |
                        +-- PACK <family name> -----+
```

Workstation syntax:

```
---- <usercode><remote ODT syntax> ------------------------------------------|
```

Semantics:

<mix-number>
This field, which must contain a mix number of an executing program, specifies the program that is to ignore the label of the file mounted on the designated unit.

<unit-mnemonic>
This field, which must contain a valid unit mnemonic that is an input unit, specifies the device in which the label is to be ignored.

<integer>
This field must be an integer of a pseudo-reader file currently on disk, specifies that the pseudo reader is to be used as the input file.

PACK <family-name>
The PACK keyword specifies that a disk identifier follows instead of unit mnemonic.

Example:

MCP Message	Command
*DMPALL ON DISK =300 FILE INPFILE (LABELED USER/MASTER/FILE) NOT IN DISK DIRECTORY	300IL DPA;

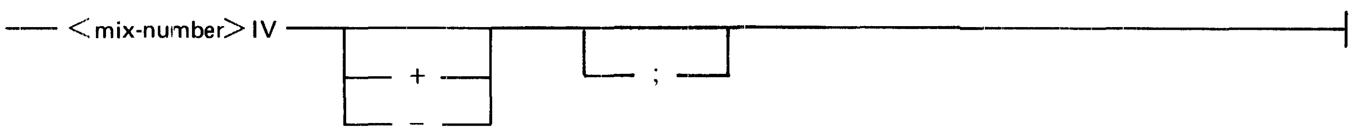
IV (Invisible)

The IV system command makes a task either transparent or visible to the normal MX and WY system commands. The IV system command can be used to reduce ODT traffic by hiding system-oriented programs that remain in the mix but whose status is not usually of interest to the operator.

If the optional + or – keysymbols are not specified, the invisibility status is reported. The + keysymbol makes the task invisible and the – keysymbol restores normal visibility. Invisible tasks are reported by the MX and WY system commands in the following cases:

1. The mix number of the invisible task prefaces the command, such as 123 WY.
2. The command is prefaced by the USER system command.
3. The ALL keyword follows the command.
4. The task is waiting operator input or action.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number>
: This field, which must contain a mix number of an executing program, specifies the program for which the invisibility status is being changed or inquired.

+
: The + keysymbol causes the task specified by <mix-number> to be invisible.

–
: The – keysymbol causes the task specified by <mix-number> to be restored to normal visibility.

Examples:

Command	Response
238 IV	*CANDE ON DISK =238 JOB NOW VISIBLE.
238 IV+	*CANDE ON DISK =238 JOB NOW INVISIBLE.
238 IV–	*CANDE ON DISK =238 JOB NOW VISIBLE.

JOBSTART (Initiate Job Transfer to Another Host)

The JOBSTART system command requests that the task file on disk specified by <file-identifier> be sent to the host in a BNA network specified by <hostname>, and that the task be run there. The BNA system must be running locally for this instruction to be valid. The syntax within the task file must be valid syntax for the receiving host system. The local BNA system does not syntax-check the information in the task file.

Syntax:

```
—— JOBSTART <file-identifier>; HOSTNAME = <host-name> ─┬───────┬──────────────────┤
                                                       └── ; ──┘
```

Semantics:

<hostname>
: This field must contain a valid BNA hostname of a BNA host computer system currently in the BNA network.

<file-identifier>
: This field, which must contain a valid file identifier, specifies the name of the task file. The instructions contained in this file must be valid on the receiving BNA host system.

Examples:

USER TEST/TEST JOBSTART REMOTE/DECK;HOSTNAME = A10

USER PROD/USER TJOBSTART TEST/JOB-FILE;HOSTNAME = B1985;

JQ (Job Queues)

The JQ command displays the value of all attributes associated with one or all job queues. The attributes are described in detail in the MQ command in this section. The active job count for jobs executed through a given job queue is included if non-zero.

Syntax:

Semantics:

JQ
    Displays the value of all attributes associated with each existent job queue.

JQ <number>
    Displays the value of all attributes associated with a specific job queue.

Example:

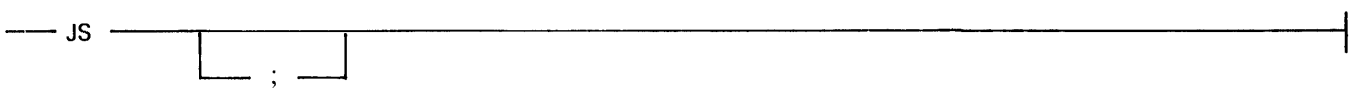
```
JQ
   QUEUE 0:
         DEFAULT QUEUE
         MIXLIMIT = 6
         ACTIVE JOB COUNT = 4
         DEFAULTS:
               ELAPSED TIME = 600 SECONDS
         LIMITS:
               PRIORITY = 6
               MEMORY = 250000 BITS
               PROCESSOR TIME = 1800 SECONDS
   QUEUE 69:
         MIXLIMIT = 2
         DEFAULTS:
               NONE
         LIMITS:
               LINES = 180000
               VIRTUAL DISK = 3000 SECTORS
               PRIORITY = 5
   END JQ
```

JS (Jiggle Schedule)

The JS system command requests the MCP to attempt execution of the top entry in each job queue and any entries in the tasking schedule.

The operating system checks the active schedule as each program goes to end of task or when a program is scheduled and executes programs that are in the active schedule, if possible. The JS system command causes the operating system to check the active schedule when the instruction is entered. It is most useful when temporary memory fragmentation has kept scheduled entries from executing.

Syntax:



Example:

JS;

KA (Analyze Disk)

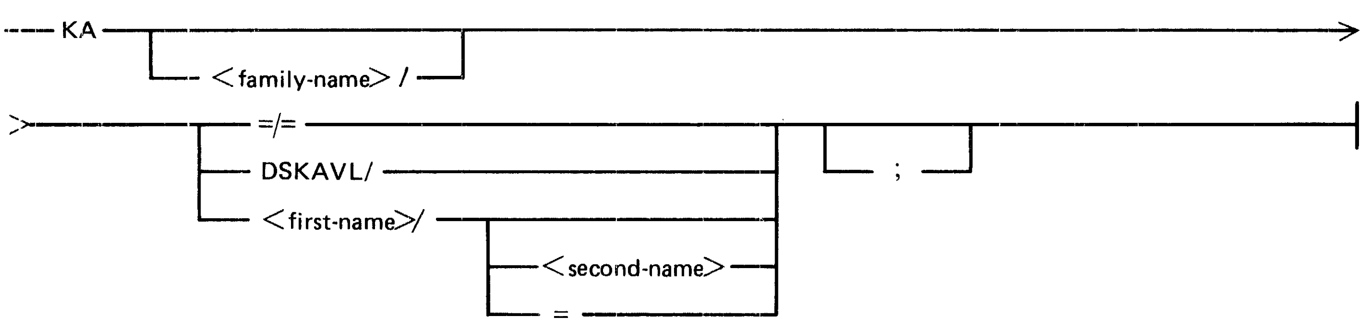
The KA system command allows the system operator to analyze the contents of a disk directory, including file area assignments.

If a disk identifier is included in the KA system command, information is displayed for the specified disk pack or disk cartridge; otherwise, information is displayed for the system disk. If the DSKAVL keyword is included in the command, the available disk areas are listed.

If the PAN name table entry is present, that program (normally SYSTEM/PANDA) is initiated whenever a KA system command is entered with the =/=, <first-name>/= or DSKAVL parameters. If that program is not on disk, the MCP analyzes the disk directory and prints the results.

If the last characters of <second-name> in the case of <first-name>/<second-name> is a question-mark character (?), the SYSTEM/PANDA program performs a "wild-card" KA, meaning it tabulates those files whose first characters of <second-name> match the string up to the question-mark.

Remote ODT syntax:



Semantics:

<family-name>
: This field, which must contain a valid disk identifier, specifies the user disk in which to analyze the disk directory.

=/=
: The =/= keysymbol causes all the files on the SYSTEM disk or the user disk specified by <family-name> to be analyzed.

DSKAVL
: The DSKAVL keysymbol causes the available disk areas to be listed.

<first-name>
: This field, which must contain a first name, specifies the main-directory name in the disk directory to be analyzed.

<second-name>
: This field, which must contain a 10-character name, specifies the subdirectory name for the file to be analyzed.

=
: The = keysymbol causes all the files having the specified <first-name> to be analyzed.

Examples:

KA DMPALL;

KA USER/DSKAVL/;

KA MASTER/=;

KA DSKAVL;

KA =/=;

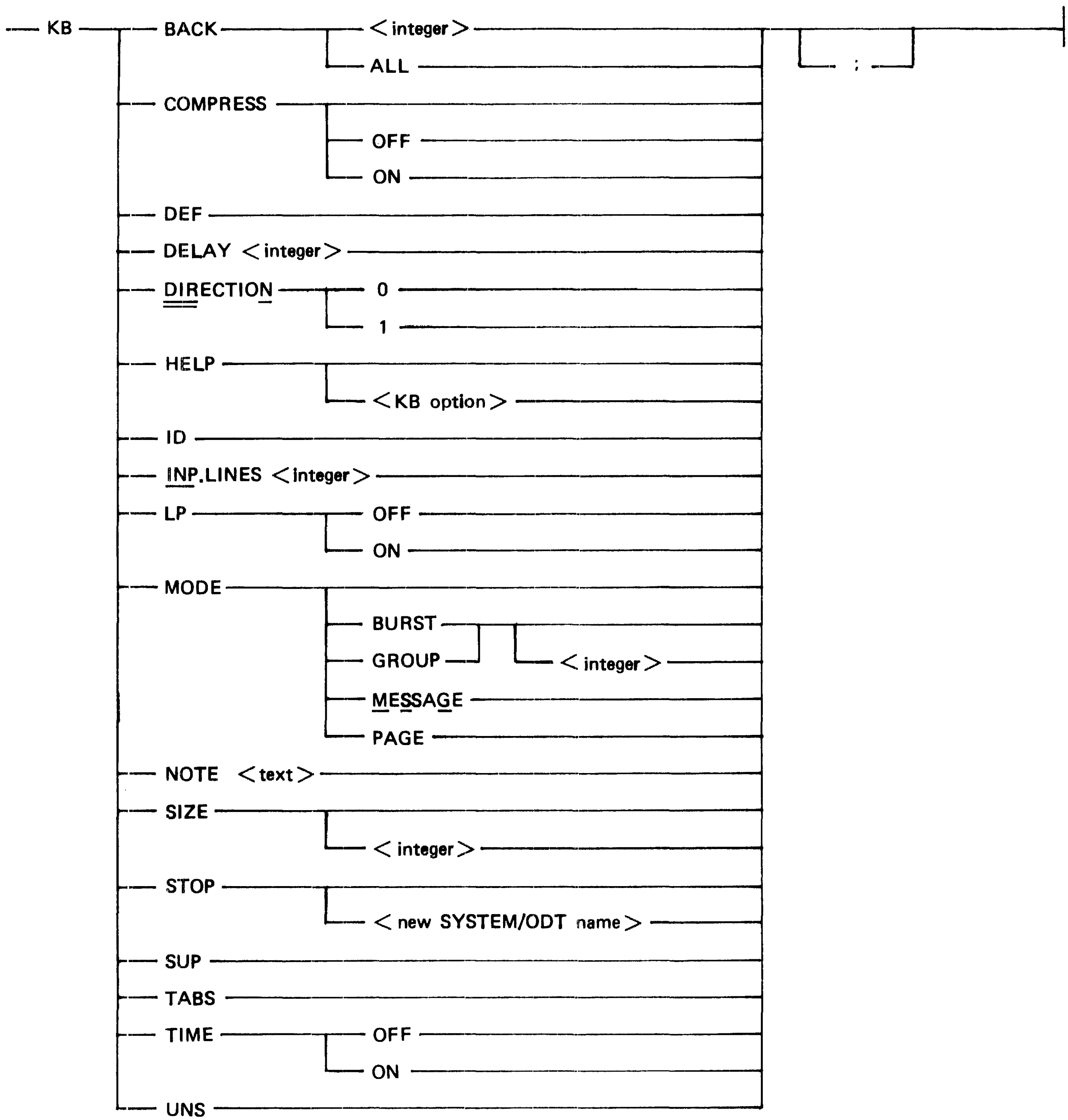
KA PAYABLES/PAYROLLDB/=

KA COBOL/IN?

KB (Keyboard Options)

The KB system command specifies certain characteristics for displaying the ODT information.

Remote ODT syntax:



Semantics:

BACK

The BACK keyword causes the last <integer> number of sectors in the ODT queue file to be formatted and displayed, a screenful at a time, on an ODT. If the ALL keyword is included, all sectors are displayed. If LP ON has been specified, the same messages are directed to a line printer file by the SYSTEM/ODT program. The ODT queue file contains the most recent ODT traffic, and defaults to 200 sectors in size.

COMPRESS

Interrogates, causes (with ON), or stops (with OFF) the replacement of multiple blanks with a single blank in ODT messages.

DEF

The DEF keysymbol restores the default ODT settings. The default settings are INP 2, DIRECTION 0, UNS, LP OFF, TIME OFF.

DELAY

The DELAY keyword specifies the tenths of seconds that SYSTEM/ODT waits to display messages from the MCP. This specification is valid in GROUP MODE only. Collected messages are displayed if any of the following occurs:

- a DELAY of <integer> tenths of seconds.
- a GROUP of <integer> messages is collected.
- a full page of messages is collected.

This feature is a subtle fine-tuning tool. It defaults to one tenth of a second.

DIRECTION

The DIRECTION keyword specifies the order in which ODT messages are to appear on the screen. If KB DIRECTION 0 is specified, the most recent message appears at the top of the ODT output area, with earlier messages appearing in reverse order downward. If KB DIRECTION 1 is specified, the most recent message appears at the bottom line of the ODT output area, with earlier messages appearing toward the top.

HELP

The HELP keyword provides the operator with a help-screen of all the KB options, and a brief description of each option. HELP followed by one of the other valid KB options provides a syntax diagram and discusses the semantics of that option.

ID

The ID keyword provides the operator with the compilation date and patch level of the SYSTEM/ODT program.

INP.LINES

The INP.LINES keyword changes the size of the input area reserved at the top of the screen. The default size of the input area is two lines. The number of reserved lines is specified by the value of <integer>, which must be in the range 2 to 10 inclusive.

Changing the size of the input area affects the size of the output area inversely. Increasing the size of the input area decreases the size of the output area proportionately.

The input area remains displayed on the screen and in the memory of the ODT itself until a different message is entered. If the operator is informed of an error in a long system command, the entire command does not have to be retyped. By positioning the cursor at the portion of the system command containing the error and correcting it, the message can be retransmitted in its error-free form. Nevertheless, the operator can, if desired, type beyond the input area up to a maximum of 10 lines.

LP

Specifying KB LP ON causes a line printer file to be opened and all ODT message traffic to be written to the line printer file as well as to the ODT device. Specifying KB LP OFF restores normal ODT-only display. The default is LP OFF. The line printer file is closed when KB LP OFF is entered.

MODE

The MODE keyword is used to either interrogate or change the manner in which messages are displayed on the ODT. The current MODE is interrogated and displayed when the KB MODE command is entered with no additional parameters.

The MESSAGE or MSG mode causes each output message to be scrolled on the ODT screen; an ETX character is optional after each operator system command.

The GROUP or BURST mode causes output messages to be collected but not displayed until one of the following conditions is true: 1) <integer> messages are received, 2) a full screen of messages is received, or 3) Delay <integer> tenths of a second elapse without a message being received. <integer> has a default value of 15, but can be given a value in the range 2 to 22 inclusive. An ETX character is optional after each operator system command. The GROUP or BURST mode maximizes the performance of most remote and hard ODT configurations.

The PAGE mode causes the entire ODT screen to be refreshed at one time. An ETX character is required after each operator system command. The PAGE mode is intended and mandatory for the older model B-9248-2 ODT devices.

NOTE

The NOTE keyword causes the <text> to be displayed on the status line of the ODT. The <text> can contain up to 56 characters. If the <text> is blank, the previous <text> is displayed on the status line. Pressing the LOCAL key on the ODT removes the <text> from the status line.

SIZE

The SIZE keyword either interrogates or changes the size of the ODT queue file. The default size of the file set at the time of a coldstart operation is 200 sectors. If <integer> is not specified, the current size of the queue file is displayed. The <integer> parameter is used to change the size of the ODT queue file to a value between 100 and 1024 sectors inclusive. Larger queue file sizes are advantageous for installations with high system activity, where wrap-around of the ODT queue file occurs rapidly. The DUMP MCP option must be temporarily reset in order to alter the ODT queue size.

STOP

The STOP keyword optionally CMs a new SYSTEM/ODT codefile name into the ODT Name Table slot and terminates operation of the currently running SYSTEM/ODT program. The MCP immediately reexecutes the program in the ODT Name Table slot.

SUP

The SUP keysymbol causes all messages on the screen, except system commands entered at the ODT device and output messages, to be suppressed.

TABS

The TABS keyword is used to set a tab stop every ten positions on the ODT. The ODT firmware must permit adjustable tab stops.

TIME

The TIME keyword is used with ODT devices and causes the time at which the system command or output message was entered to be displayed on the ODT. The time portion of the message is displayed in front of the message, and is always included on each message stored in the ODT queue, even if the option is not set. Specifying KB TIME ON sets this option and specifying KB TIME OFF resets this option.

UNS

The UNS keysymbol, meaning unsuppress, causes all messages from ZIP commands, QUEUE commands, control cards from card readers and pseudoreaders, and so forth, to be displayed on the ODT.

Examples:

KB BACK 20;

KB TIME ON;

KB LP ON;

KB SUP;

KB DIRECTION 1;

KB MODE GROUP 15

KB TABS

KB SIZE 800

KB COMPRESS ON

KB DELAY

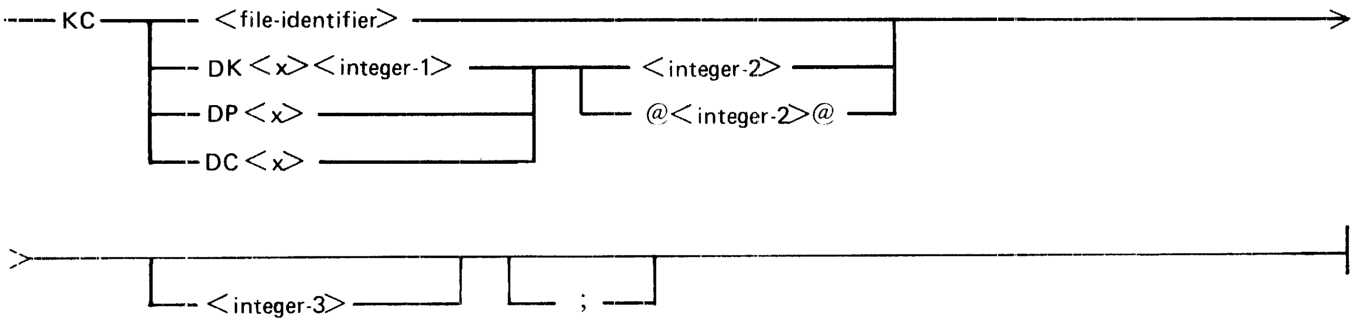
KB HELP ID

KB STOP

KC (Print Disk Segments in Character Format)

The KC system command prints selected files or segments in a character format on a line printer.

Remote ODT syntax:



Semantics:

PACK <family-name>
: The PACK keyword specifies that a disk identifier follows instead of unit mnemonic.

DC
: The DC keysymbol specifies that the disk sectors to be printed reside on a disk cartridge.

DK
: The DK keysymbol specifies that the disk sectors to be printed reside on a head-per-track disk.

DP
: The DP keysymbol specifies that the disk sectors to be printed reside on a disk pack.

<integer-1>
: This field, which must contain a non-zero integer, specifies the electronics unit of the head-per-track disk.

<integer-2>
: This field, which must contain an integer, specifies the disk address from which printing is to begin. If the at sign (@) character delimits <integer-2>, then the disk address must be expressed as a hexadecimal number.

<integer-3>
: This field, which must contain an integer, specifies the number of disk segments to print. The default value is 1. The maximum value is 100.

<x>
: This field, which must contain an upper-case character and must be concatenated with the DC, DK, or DP keysymbol, specifies the disk unit on which the disk sectors to be printed reside.

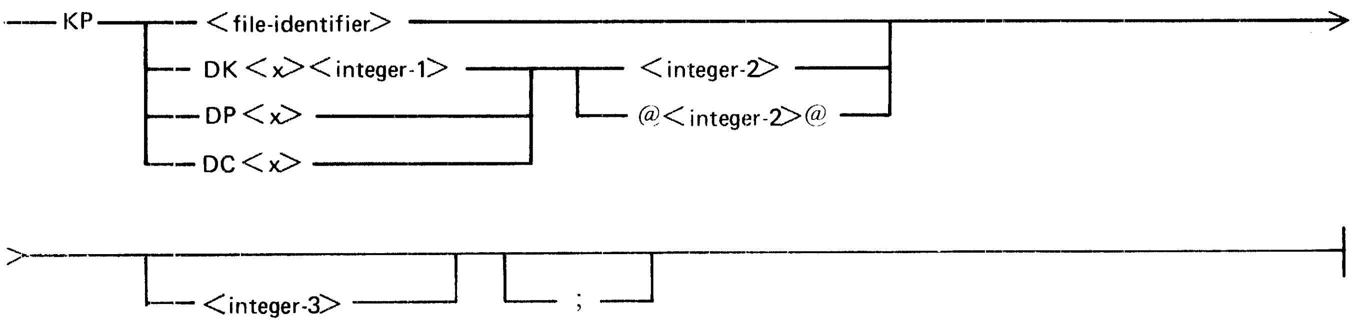
Examples:

Command	Result
KC A/B 10;	Prints 10 segments of file A/B.
KC A/B;	Prints 1 segment of file A/B.
KC CCC/X/;	Prints 1 segment of file X on user disk CCC.
KC DPA @5C@ 15;	Prints 15 segments from the hexadecimal disk address 5C on disk DPA.
KC DKA 1 200 10;	Prints 10 segments on EU 1 from the decimal disk address 200.

KP (Print Disk Segments in Hexadecimal Format)

The KP system command prints selected files or segments in a hexadecimal format on a line printer.

Remote ODT syntax:



Semantics:

PACK <family-name>
The PACK keyword specifies that a disk identifier follows instead of unit mnemonic.

DC
The DC keysymbol specifies that the disk sectors to be printed reside on a disk cartridge.

DK
The DK keysymbol specifies that the disk sectors to be printed reside on a head-per-track disk.

DP
The DP keysymbol specifies that the disk sectors to be printed reside on a disk pack.

<integer-1>
This field, which must contain a non-zero integer, specifies the electronics unit of the head-per-track disk.

<integer-2>
This field, which must contain an integer, specifies the disk address from which printing is to begin. If the at sign (@) character delimits <integer-2>, then the disk address must be expressed as a hexadecimal number.

<integer-3>
This field, which must contain an integer, specifies the number of disk segments to print. The default value is 1. The maximum value is 65.

<x>
This field, which must contain an upper-case letter and must be concatenated with the DC, DK, or DP keysymbol, specifies the disk unit on which the disk sectors to be printed reside.

Examples:

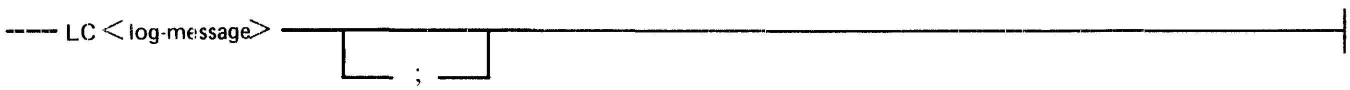
Command	Result
KP A/B 10;	Prints 10 segments of file A/B.
KP A/B;	Prints 1 segment of file A/B.
KP CCC/X/;	Prints 1 segment of file X on user disk CCC.
KP DPA @5C@ 15;	Prints 15 segments from the hexadecimal disk address 5C on disk DPA.
KP DKA 1 200 10;	Prints 10 segments on EU 1 from the decimal disk address 200.

LC (Log Comment)

The LC system command places a message into the system log file. The log system option must be set.

The message starts in the first position after the LC system command and continues to the end-of-text (ETX) character.

Remote ODT syntax:



Semantics:

<log-message>
This field must contain a message that is desired in the system log file.

Example:

LC OPERATOR JOHN JONES ON AT 8:00 AM;

LD (Load Decks)

The LD system command initiates the building of pseudo-reader files on disk to be processed by pseudo readers.

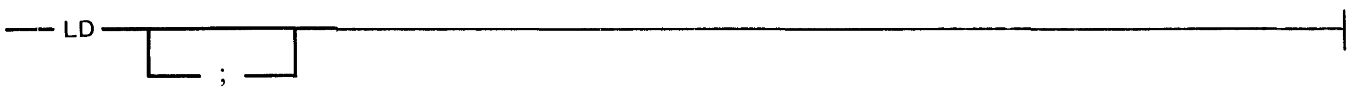
The LD system command causes the SYSTEM/LDCONTRL program to be executed. The SYSTEM/LDCONTRL program requires a ?DATA CTLDCK program control instruction, followed by the card deck, and is terminated with a ?ENDCTL program control instruction.

The file identifier of the card deck is assigned by a ?DATA <file-identifier> program control instruction preceding the data deck to be read. Each data deck that is loaded is numbered consecutively along with its file identifier, which is used in opening the pseudo-reader files.

Users can create pseudo-reader files out of disk data files by file-equating the internal file name of the SYSTEM/LDCONTRL input file (CARD) to a specific disk file (for example, LD; FILE CARD NAME USERPACK/UPDATE/PROCEDURES DSK).

The MCP processes only the first 72 characters of each card image. A percent sign (%) character terminates processing of any card image.

Remote ODT syntax:



Workstation syntax:

Example 1:

```
CONTROL
DECK
                 ? DATA CTLDCK

     DECK   ┌── ? COMPILE <program-name> COBOL74 SYNTAX
     A      │   ? DATA CARDS
            │     •
            │     •  (data deck)
            │     •
            └── ? END

     DECK   ┌── ? COMPILE <program-name> FORTRAN77 LIBRARY
     B      │   ? DATA CARDS
            │     •
            │     •  (data deck)
            │     •
            └── ? END
     DECK   ┌── ? DATA file-id
     C      │     •
            │     •  (data deck)
            │     •
            │   ? END
            └──
                ? ENDCTL
```

Example 2:

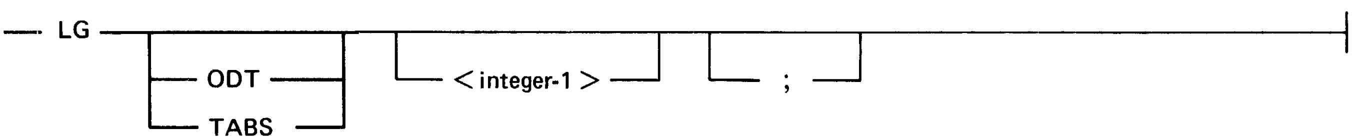
```
     DECK   ┌── ? EXECUTE PROG10; SWITCH 0  =  1;%run daily
     A      │   ? FILE DISK NAME DATAFILE;      %
            │   ? FILE TAPE1 NAME DIFFNAME;
            └── ? END

     DECK   ┌── ? EXECUTE PROG20; AFTER PROG10;%updates TFILE
     B      │   ? FILE T NAME DIFFNAME;
            │   ? FILE LINE NOCHAR REP 2;
            └── ? END

                ? ENDCTL
```

LG (Log Transfer and Print)

The LG system command transfers and prints either the system log or the ODT log file. The LG system command functions identically to the LN system command. The log files are numbered sequentially starting with LOG/#000001 or ODTLOG/<date-and-time>, where <date-and-time> has the form <MMDDYYHHMM>. The program SYSTEM/LOGOUT, SYSTEM/ODTLOGOUT, or TABS/LOGOUT is executed, performing the necessary file equation to print the specified log file. The program must be in the disk directory in order for the MCP to process the LG system command.

If the ODT or TABS keywords are not included in the LG system command, the system log file is transferred and the SYSTEM/LOGOUT program is executed.

Remote ODT syntax:



Semantics:

ODT
: The ODT keyword causes the ODT log file to be transferred and the SYSTEM/ODTLOGOUT program to be executed.

TABS
: The TABS keyword causes the system log file to be transferred and the TABS/LOGOUT program to be executed.

<integer-1>
: This field, which must contain an integer in the range 100 to 10000 inclusive, specifies the size of each disk area to be assigned to the LOG file. It is ignored for an ODT log transfer.

Examples:

LG;

LG TABS

LG ODT;

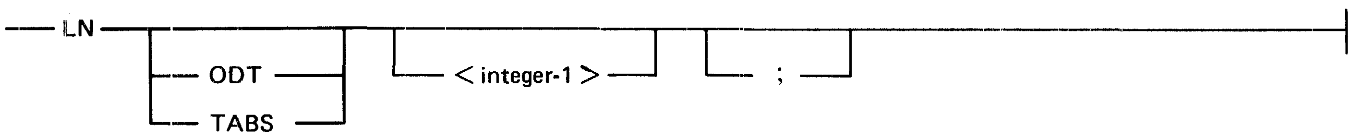
LG 1000

LN (Log Transfer and Print)

The LN system command transfers and prints either the system log or the ODT log file. The LN system command functions identically to the LG system command. The log files are numbered sequentially starting with LOG/#000001 or ODTLOG/<date-and-time>, where <date-and-time> has the form <MMDDYYHHMM>. The program SYSTEM/LOGOUT, SYSTEM/ODTLOGOUT, or TABS/LOGOUT is executed, performing the necessary file equation to print the specified log file. The program must be in the disk directory in order for the MCP to process the LN system command.

If the ODT or TABS keywords are not included in the LN system command, the system log file is transferred and the SYSTEM/LOGOUT program is executed.

Remote ODT syntax:



Semantics:

ODT

The ODT keyword causes the ODT log file to be transferred and the SYSTEM/ODTLOGOUT program to be executed.

TABS

The TABS keyword causes the system log file to be transferred and the TABS/LOGOUT program to be executed.

<integer-1>

This field, which must contain an integer in the range 100 to 10000 inclusive, specifies the size of each disk area to be assigned to the LOG file. It is ignored for an ODT log transfer.

Examples:

LN

LN TABS

LN ODT;

LN 750

LP (Lock Program)

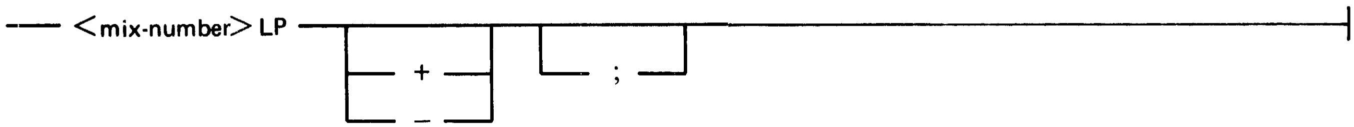
The LP system command interrogates or changes the PROTECTION program attribute for a running program. Setting the PROTECTION program attribute helps to prevent a running program from being accidentally tampered with by the following system commands.

CL
DP
DS
ST
SW

A program can have the PROTECTION program attribute set at execution time by specifying the PROTECTION attribute in the EXECUTE program control instruction.

Specifying the LP system command without the plus sign (+) or minus sign (–) character interrogates the PROTECTION file attribute and displays the current setting.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number>
This field must contain a mix number of a task currently in the mix.

\+
The + keysymbol causes the PROTECTION program attribute to be set.

–
The – keysymbol causes the PROTECTION program attribute to be reset.

Examples:

Command	Response
334LP	*SYSTEM/ODTLOGOUT ON DISK =334 LOCK FLAG OFF
334LP+	*SYSTEM/ODTLOGOUT ON DISK =334 LOCK FLAG ON
334LP–	*SYSTEM/ODTLOGOUT ON DISK =334 LOCK FLAG OFF

LPx (Line Printer)

The LPx command sends AX input to the SYSTEM/BACKUP currently controlling a particular line printer. It avoids the necessity of determining the mix number of the SYSTEM/BACKUP program and is especially useful at sites with multiple printers and multiple copies of the SYSTEM/BACKUP program in the mix. The "x" in "LPx" represents any valid printer on the system; for example, LPA.

Syntax:

```
---- <printer-mnemonic><text> ------------------------------------------|
```

Semantics:

<printer-mnemonic>
<printer-mnemonic> represents any valid system line printer LPA through LPE.

<text>
<text> is any information known to SYSTEM/BACKUP. Refer to volume 2 of the *B 1000 Systems System Software Operation Guide* for a description of valid AX input for SYSTEM/BACKUP.

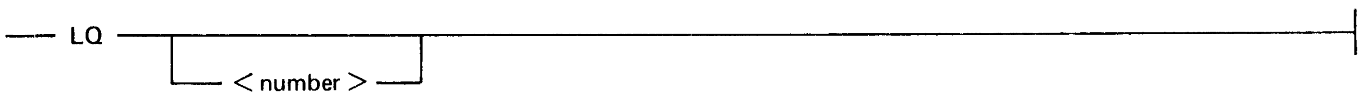
Examples:

Command	Response
LPB WHERE	%*SYSTEM/BACKUP ON DISK =1679 PRINTING (A) LINE ON USER1, RECORDS WRITTEN =74, AT RECORD NUMBER 74, EOF = 270
LPA SINGLE	
LPA +500	

LQ (List Queues)

The LQ command displays information regarding the jobs in one or all job queues.

Syntax:



Semantics:

LQ
: Displays the queue number, the number of jobs in the queue, and information about the head job in each job queue.

LQ <number>
: Displays information about all jobs currently in a specific job queue

Examples:

Command	Response

LQ	QUEUE 0 (FIRST OF 3 ENTRIES):
	    #2561 *DOCTOR ON DISK WILL USE 95 KB, SCHED PR = 4,
	     IN FOR 00:02:12.7, JOB QUEUE=0.
	QUEUE 4 (NO ENTRIES)
	QUEUE 800 (ONLY ENTRY)
	    #2549 WE-SHALL/ALL-BE ON WELFARE WILL USE 9 KB,
	     SCHED PR = 4, IN FOR 00:21:20.0, JOB QUEUE=800.
	END LQ.

LQ 0	QUEUE 0:
	    #2561 *DOCTOR ON DISK WILL USE 95 KB, SCHED PR = 4,
	     IN FOR 00:02:12.7, JOB QUEUE = 0.
	    #2562 *SDL2 ON DISK: *ARTHUR/S.TEST ON MCP WILL USE
	     114 KB, SCHED PR= 4, IN FOR 00:01:50.5,
	     JOB QUEUE=0
	    #2564 *SYSTEM/COPY ON DISK WILL USE 20 KB,
	     SCHED PR = 4, IN FOR 00:00:19.1, JOB QUEUE=0.
	END LQ.

LT (Load Train Printer Table)

The LT system command changes the translate table for the 400 and 750 line-per-minute (LPM) Train Printers. Train printers have interchangeable print train modules that allow a variety of specialized character sets to be used. Each print module requires a unique translator to be loaded into the printer control.

The 1100 and 1500 LPM Train Printers require the B 1247-4 Printer Control and have an automatic train identification feature that allows the MCP to immediately recognize the print translator required, and to load it into the printer control when necessary.

The 400 and 750 LPM Train Printers require either the B 1247 or B 1247-4 Printer Controls and do not have the automatic feature. These train printers require notification from the system operator whenever the train module is changed. This is accomplished by the LT system command.

The characteristics of the printer translate tables and the LT system command depend on which printer control (B 1247 or B 1247-4) is being used. The printer control identification can be determined from a SYSTEM/ELOGOUT printer listing.

B 1247 Train Printer Control (Control Identification = @10@)

If the B 1247 Printer Control (not allowed with the 1100 and 1500 LPM Train Printers) is used, the file SYSTEM/PRINTCHAIN is created automatically by the MCP on the SYSTEM disk. The MCP loads a translator from this file into the printer control based on the setting of the TRAIN SELECTOR SWITCH on the printer. The following table shows the possible switch settings and their associated translators.

Train Selector Switch Setting	Translator
1	64-character EBCDIC
2	48-character EBCDIC
3	16-character EBCDIC
4	96-character EBCDIC
5	48-character FORTRAN
6	48-character B300/B500
7	48-character RPG
8	48-character FORTRAN-NONSTD

The MCP loads the translator specified by the switch setting the first time the printer goes ready following a CLEAR/START operation. If it is necessary to change the character set, mount the new train module in the printer, select the proper switch setting, make the printer ready, and enter the LT system command to notify the MCP of the presence of the new character set. Specifying <train-identification> in the LT system command is not valid, because the MCP uses the setting of the TRAIN SELECTOR SWITCH to determine the proper translator.

B 1247-4 Train Printer Control (Control Identification = @3E@)

If the B 1247-4 Printer Control is used, the file SYSTEM/TRAINTABLE must be present on the SYSTEM disk. This file is created by the SYSTEM/BUILDTRAIN program, and must contain all print translators required by an installation. Refer to the SYSTEM/BUILDTRAIN program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the SYSTEM/BUILDTRAIN program and a list of the standard print translators and their train identifications.

For 400 and 750 LPM Train Printers connected to the B 1247-4 Printer Control, the TRAIN SELECTOR SWITCH is ignored, and the MCP loads the translator specified by the LT system command into the printer control.

The MCP displays the following message the first time a 400 or 750 LPM Train Printer connected to a B 1247-4 Printer Control goes ready after a CLEAR/START operation.

"LT" REQUIRED FOR <line-printer-unit-mnemonic>

A translator is loaded by the MCP only when requested to do so through the LT system command. Once loaded, the MCP does not change the translator until another LT system command is entered.

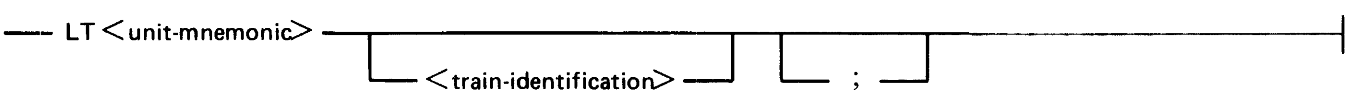
The first time that an 1100 or 1500 LPM Train Printer goes ready after a CLEAR/START operation, the MCP automatically loads the translator specified by the train module identification. To change a train module, it is necessary to mount the new module in the printer, make the printer ready, and enter the RY system command to notify the MCP of the change.

If <train-identification> is omitted from the LT system command, the MCP displays the train identification number of the train currently being used.

NOTE

The interrogation feature is allowed only with the B 1247-4 Printer Control.

Remote ODT syntax:



Semantics:

<unit-mnemonic>

This field, which must contain a valid line-printer unit mnemonic, specifies to the operating system the line printer that has the new translator.

<train-identification>

This field must contain a valid train identification. Refer to the SYSTEM/BUILDTRAIN program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a list of the valid train identifications.

Examples:

Command	Response
LT LPA	"005" WAS SELECTED ON LPA
LT LPB 255	EBCDIC3-64 = "255" LOADED ON LPB
LT LPC EBCDIC96	EBCDIC96 = "016" LOADED ON LPC

LW (List WFL)

The LW system command lists all WFL jobs currently included in the restart table for the system. This command displays the name of the restart file associated with the job as well as the current status of the job.

Remote ODT syntax:

```
---- LW ------------------------------------------------------------|
```

Example:

Command	Response
LW	JOB6206 SCHEDULED
	JOB6888 SCHEDULED
	JOB8748 SCHEDULED

MCS (Message to MCS)

The MCS command sends AX input to the program in the MCS Name Table slot, and avoids the necessity of ascertaining the mix number of that job. Only one copy of the program can be running; it need not have been initiated by the AMCS MCP option.

Syntax:

```
—— MCS < text > ——————————————————————————————————|
```

Semantics:

<text>
This is any AX input recognizable by the program in the MCS name table slot.

Example (assuming SMCS is in the MCS slot and is running):

Command

MCS S ALL HAS ANYONE SEEN THE UPDATE PACK?

Response

%*SMCS ON DISK =1677 MESSAGE SENT TO 89 STATIONS

Command

MCS MAKE STATION LEGRAND READY

Response

%*SMCS ON DISK =1677 STATION LEGRAND CHANGED TO READY 1

Command

MCS STOP

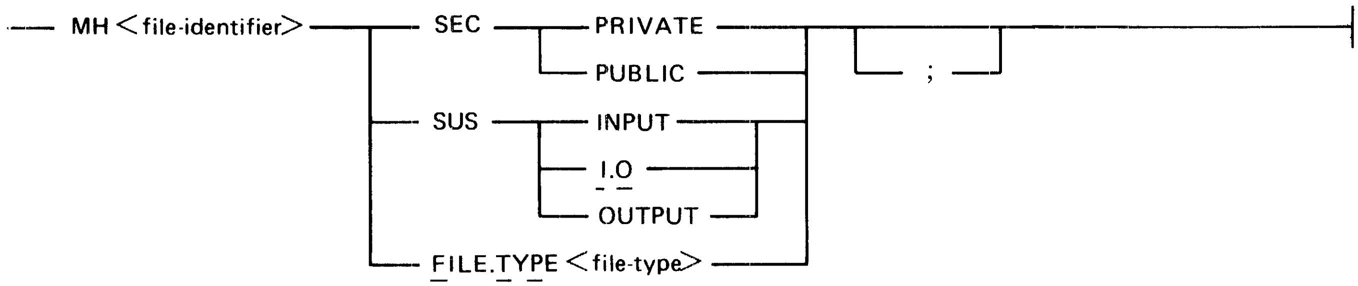
Response

%*SMCS ON DISK =1677 TERMINATING

MH (Modify Header)

The MH system command changes the security attributes or file type of a disk file. If access to a file is currently restricted in any way (PRIVATE, INPUT, or OUTPUT), the MH system command must be preceded by a USER system command with the proper usercode/password pair or a PRIVILEGED usercode/password pair.

Remote ODT syntax:



Workstation syntax:

Semantics:

SEC
: The SEC keysymbol specifies the access rights to the file. The access rights can be set to PUBLIC or PRIVATE. The PRIVATE keyword specifies the access rights to the file to be a proper usercode/password pair or a PRIVILEGED usercode/password pair. The PUBLIC keyword specifies the access rights to the file to be from any program.

SUS
: The SUS keysymbol limits the type of access to a file. The type of access can be INPUT, I.O (input and output), or OUTPUT. The INPUT keyword limits the type of access for a file to input only. If an object code file is marked as INPUT, it is considered executable and cannot be opened as a data file by a program. The I.O keysymbol allows the file to be opened input or output by another program. The OUTPUT keyword limits the type of access for a file to output only.

FILE.TYPE
: The FILE.TYPE keysymbol allows the file type of a disk file to be changed to <file-type>, where <file-type> can have any of the following values.

BASIC	FORTRAN77	RPG
COBOL	IBASIC	SDL
COBOL74	JOBS	SDL2
DASDL	MIL	SEQD
DATA	NDL	SORT
FORTRAN	PASCAL	UPL2

Examples:

Command: MH MASTER/FILE SEC PRIVATE;
Response: "MASTER/FILE SECURITYTYPE SET TO PRIVATE

Command: USER PRIVIL/USER MH (PRIVATE)/FILE SUS INPUT SEC PUBLIC;
Response: "(PRIVATE)/FILE" SECURITYUSE SET TO INPUT
"(PRIVATE)/FILE SECURITYTYPE SET TO PUBLIC

Command: US USER/A MH TESTFILE SUS I.O
Response: "TESTFILE" SECURITYUSE SET TO I.O

Command: MH TEST/FILE FTP DATA
Response: TEST/FILE FILETYPE CHANGED TO DATA

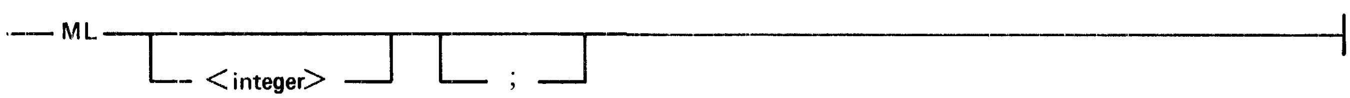
ML (Mix Limit)

The ML system command interrogates or changes the maximum number of low-priority jobs allowed concurrently in the mix. Any further attempt to execute low-priority programs after the mix limit has been reached causes those programs to remain in the active schedule. The only tasks that are allowed to start after the mix limit has been reached are those having a PROCESSOR.PRIORITY program attribute of 9 or greater (crashout priority) and those having a SCHEDULE.PRIORITY program attribute of 15 (synchronous tasks).

If <integer> is omitted, the current setting of the mix limit is interrogated and displayed.

The coldstart programs (COLDSTART/DISK and COLDSTART/TAPE) set the mix limit to 63.

Remote ODT syntax:



Semantics:

<integer>
: This field, which can contain any integer in the range 0 to 255 inclusive, specifies the maximum number of jobs allowed in the mix at a priority of eight or less. Specifying the ML system command without <integer> displays the current mix limit.

Examples:

Command	Response
ML	MIX LIMIT=15
ML 4;	MIX LIMIT CHANGED FROM 15 TO 4

MM (Memory Management)

The MM system command sets certain attributes of the MCP Memory Management System.

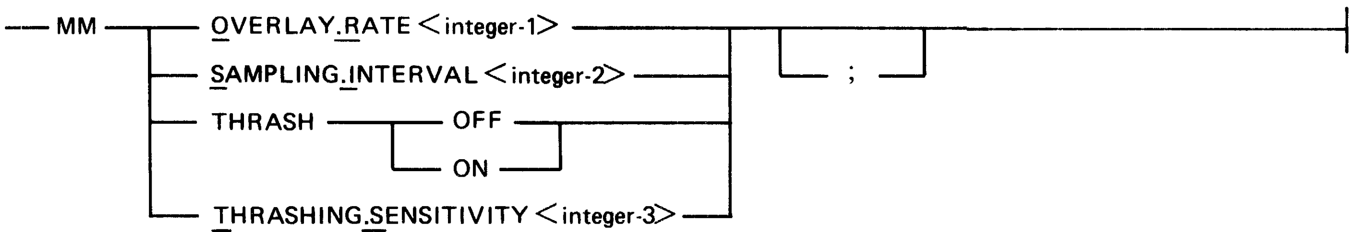
The MM system command is not allowed if the Second-Chance Memory Management algorithm is used, that is, if the MPRI MCP option is not set.

The values assigned to all the attributes, except for the SAMPLING.INTERVAL attribute, are retained by the MCP when a CLEAR/START operation is performed, and need not be specified once set.

If <integer> is omitted for the OVERLAY.RATE, THRASHING.SENSITIVITY, or SAMPLING.INTERVAL attributes, or if the ON or OFF keywords are omitted for the THRASH attribute, the current value of the attribute is displayed.

Refer to appendix A, MCP Memory Management, for further operational details on Thrashing Detection and Priority Memory Management.

Remote ODT syntax:



Semantics:

OVERLAY.RATE
: The OVERLAY.RATE keyword specifies the maximum overlay rate the system allows before reporting a thrashing condition. The default value is 10 overlays per second. The coldstart programs (COLDSTART/DISK and COLDSTART/TAPE) set the OVERLAY.RATE to 10.

<integer-1>
: This field, which must contain an integer in the range 1 to 20 inclusive, specifies the number of overlays per second allowed by the system before the SYSTEM IS THRASHING message is displayed. The default value is 10 and is set by the coldstart programs (COLDSTART/DISK and COLDSTART/TAPE).

SAMPLING.INTERVAL
: The SAMPLING.INTERVAL keyword specifies the amount of time to wait before scanning memory. The default value is set by the MCP during the CLEAR/START operation, and is dependent on the system memory size. This default value cannot be changed by the MM system command unless the DBUG MCP option is set. Changes to the default value are not recommended.

<integer-2>
: This field must contain an integer in the range 1 to 50 inclusive. The value of <integer-2> is dependent on the system memory size and is set by the MCP during the CLEAR/START operation. Changes to <integer-2> are not recommended.

THRASH
: The THRASH keyword specifies the frequency that the MCP displays the SYSTEM IS THRASHING message when the thrashing condition has been detected by GISMO.

OFF

The OFF keyword is used with the THRASH keyword and causes the SYSTEM IS THRASHING message to be displayed as long as thrashing continues and only when a program enters or leaves the mix.

ON

The ON keyword is used with the THRASH keyword and causes the SYSTEM IS THRASHING message to be displayed at each N.SECOND interval (a variable period of time determined by the number of programs in the mix) as long as thrashing continues.

THRASHING.SENSITIVITY

The THRASHING.SENSITIVITY keyword specifies the maximum number of seconds that the overlay rate can be continuously exceeded before the MCP receives a thrashing interrupt.

<integer-3>

This field, which must contain an integer in the range 10 to 60 inclusive, specifies the maximum number of seconds that the overlay rate can be continuously exceeded before the SMCP receives a thrashing interrupt. The default is 20 and is set by the coldstart programs (COLDSTART/DISK and COLDSTART/TAPE).

Examples:

Command	**Response**
MM OVERLAY.RATE	OVERLAY.RATE = 10
MM THRASH ON	THRASHING MESSAGE ON
MM THRASHING.SENSITIVITY 15	THRASHING.SENSITIVIY = 15

MP (Memory Priority)

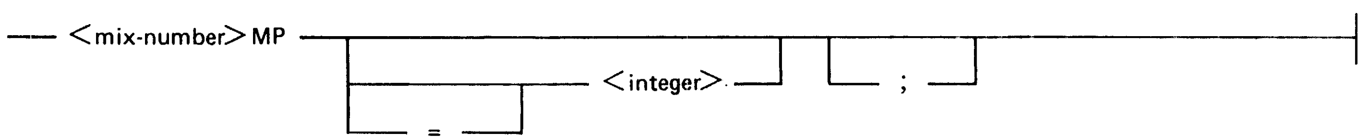
The MP system command interrogates or changes the MEMORY.PRIORITY attribute of a program currently in the mix.

The MP system command is valid only when the MPRI MCP option is set.

If <integer> is omitted, the MCP displays the current value of the MEMORY.PRIORITY attribute for the specified program.

Refer to the MEMORY.PRIORITY program control instruction in section 4 for further information on MEMORY.PRIORITY.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number>
: This field, which must contain a valid mix number of a program currently in the mix, specifies the task in which to interrogate or change the MEMORY.PRIORITY attribute.

<integer>
: This field, which must contain an integer in the range 0 to 15 inclusive, specifies the value of the MEMORY.PRIORITY attribute for the program specified by <mix-number>.

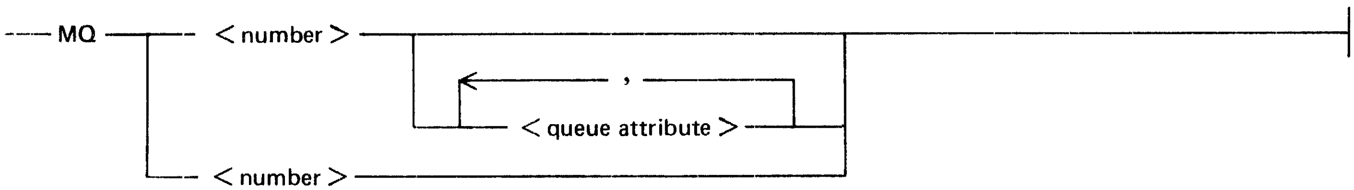
Examples:

Command	**Response**
1245MP=	*NDL/HANDLER ON DISK =1245 MP=15
1269MP 7	*TEST/PROGRAM ON DISK =1269 MEMORY PRIORITY CHANGED TO 7

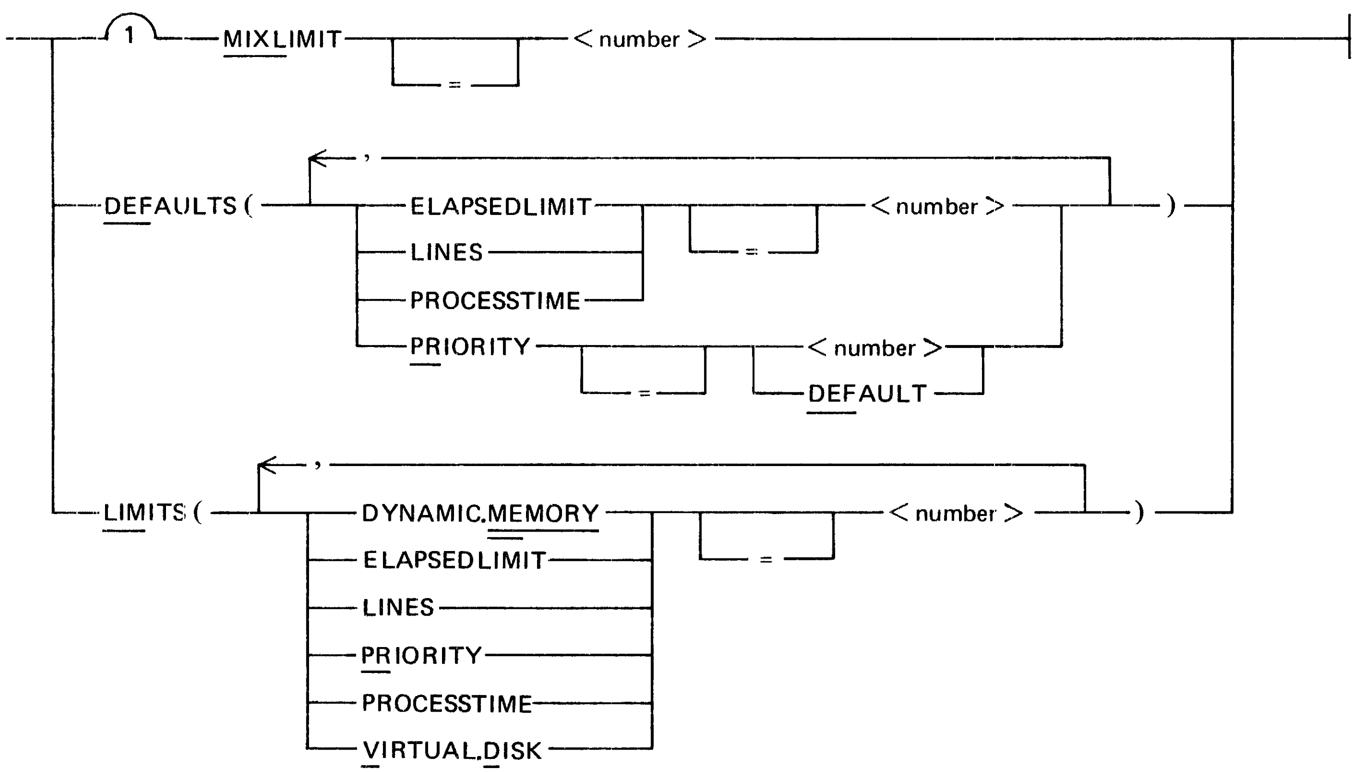
MQ (Make or Modify Queue)

The MQ command creates a job queue with certain attributes, modifies the attributes of an existing job queue, or deletes an existing job queue. The attributes provide default and maximum limits for jobs scheduled through a certain job queue. The system does not provide limits on those attributes not specified in the MQ system command.

Syntax:



<Queue attribute> syntax:



Semantics:

MQ <number>
: Makes a job queue with the specified queue number. Queue numbers may range from 0 to 1022; a maximum of six job queues may exist.

MQ - <number>
: Eliminates the given job queue from the system. Any jobs currently in the job queue are placed in another queue, if no queue limits are exceeded. Otherwise, the jobs are removed from the job queue. Job queue #0 may not be eliminated.

<queue-attribute>
: Allows the operator to define default and maximum limits associated with a job queue.

MIXLIMIT = <number>
: Assigns a value for the mixlimit of jobs scheduled through the job queue. If the number of running jobs (and asynchronous tasks) initiated through the queue equals or exceeds the queue mixlimit, or if the overall system mixlimit has been reached by jobs of processor priority less than 9, then no more jobs are executed from the job queue until the excess has cleared.

DEFAULTS
: Those clauses used within a DEFAULTS clause provide resource limits that apply to jobs scheduled through the job queue unless overridden by appropriate limit statements.

LIMITS
: Attribute values provided within a LIMITS clause provide maximum system resource limits that a job may specify and still be accepted into the job queue. A job specifying a job queue and one or more attribute values exceeding that queue's LIMITS values will fail scheduling with an appropriate error diagnostic.

The following attributes apply to both DEFAULTS and LIMITS phrases.

ELAPSEDLIMIT = <number>
: Provides a limit in seconds for the maximum elapsed time that a job may be in the mix.

LINES = <number>
: Provides a limit for the number of printed lines that the job may produce.

PRIORITY = <number>
: Assigns <number> as the processor priority value for jobs scheduled through the queue, where <number> may range from 0 to 15.

PROCESSTIME = <number>
: Specifies the maximum processor time in seconds that a job may accumulate.

In addition, the following variation is permitted in the DEFAULTS phrase only.

PRIORITY = DEFAULT
: Causes the job queue to assign no priority to jobs run through the queue. Jobs will use the processor priority assigned by the compiler or the value altered with a MODIFY command, unless a PRIORITY attribute is specified within the job.

Additionally, the following variations may appear in the LIMITS phrase only.

DYNAMIC.MEMORY = <number>
Limits the amount of dynamic memory that any task invoked by the job may request for its execution. Memory is expressed in bits.

VIRTUAL.DISK = <number>
Limits the segments of virtual disk that any task invoked by the job may request. Note that virtual disk is that disk used for rolling out data from dynamic memory, and the attribute has meaning only for jobs that use dynamic memory.

Examples:

Command

```
MQ 900 MIXLIMIT=2, DEFAULTS (PRIORITY=4, PROCESSTIME=2400),
LIMITS (PRIORITY=5, LINES=150000, MEMORY=3500000)
```

Response

```
QUEUE 900:
    MIXLIMIT=2
    DEFAULTS:
          PRIORITY = 4
          PROCESSTIME = 2400 LIMITS:
          PRIORITY = 5    LINES = 150000    MEMORY = 3500000 BITS
```

Command

```
MQ - 900
```

Response

```
JOB QUEUE 900 ELIMINATED FROM SYSTEM.
 *SDL2 ON DISK : *SYSTEM/COPY-TEST ON TWELVE =2524
  MOVE TO JOB QUEUE 0.
 *MONSTER/PRINT-JOB ON MISC =2550 DOES NOT FIT INTO
  ANY JOB QUEUE...JOB RS-ED.
```

MR (Discard Most Recent File)

The MR system command causes the MCP to save the old file by purging the newly created file when a duplicate file situation occurs.

Remote ODT syntax:

```
—— <mix-number> MR ─┬─────┬──────────────────────────────────┤
                    └─ ; ─┘
```

Workstation syntax:

```
—— <usercode><remote ODT syntax> ──────────────────────────────┤
```

Semantics:

<mix-number>
This field must contain a mix number of a program waiting to close a file for which another file with the same name exists on disk.

Example:

1256MR

MU (Multipack Files)

The MU system command interrogates the multipack file information table maintained by the MCP. This table contains information concerning all multipack files currently in use on the system, as well as all multipack files that were in use when the system was interrupted or halted and a CLEAR/START operation was required.

The MCP removes the information in the multipack file information table when the user count for the file goes to zero, that is, all programs using the file have gone to end of job.

An entry is retained in the multipack file information table for any multipack file that is still in use when a CLEAR/START operation occurs, until explicitly deleted from the table by the system operator. Refer to the RT system command for information about deleting entries from the multipack information table. Because such a file can be only partially created, yet entered into the disk directory on one or more user disks, the multipack file information table provides the system operator with the serial numbers of all user disks that can require manual action; for example, mounting the user disk and removing the partially-created file.

Remote ODT syntax:

Examples:

Command	Response
MU;	NO MULTI PACK FILES IN USE
MU;	"USERPACK/TEST/FILE" BASE=123456 CONTINUATION PACK SERIAL NUMBER=654321 OFF LINE. CONTINUATION PACK SERIAL NUMBER=555555 ON LINE. CONTINUATION PACK SERIAL NUMBER=121212 OFF LINE.
MU;	"PAYROLL/MASTER/" BASE=111111 WAS IN USE LAST CLEAR/START CONTINUATION PACK SERIAL NUMBER=222222 ON LINE. CONTINUATION PACK SERIAL NUMBER=333333 ON LINE.

MX (Mix)

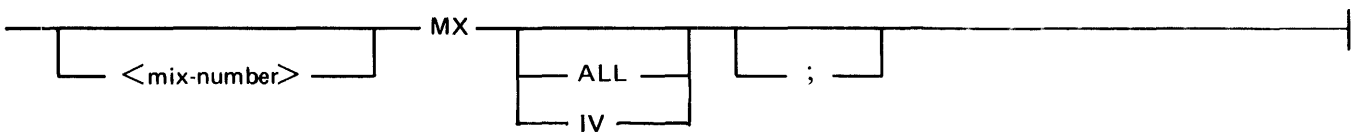
The MX system command displays the priority and current status of one or all programs in the mix. The MX system command functions identically to the WY system command.

If the MX system command is prefaced with a mix number, only information about that specific program is displayed. If the mix number is omitted, information about all visible tasks in the mix is displayed. Refer to the IV system command for information concerning task invisibility. If the optional ALL keyword is included, information about all tasks, including invisible tasks, is displayed.

If a program is awaiting operator action, the information displayed includes the action alternatives available to the operator.

If the MPRI MCP option is set, the processor and memory priorities are displayed instead of the priority number.

Syntax:



Semantics:

<mix-number>
This field, which must contain a valid mix number of a program currently in the mix, specifies the task in which to interrogate the priority and status.

ALL
The ALL keyword specifies that information about all tasks, including invisible tasks, is to be displayed.

IV
The IV keyword specifies that information about invisible tasks only is to be displayed.

The following examples assume that the MPRI MCP option is set. If the MPRI MCP option is not set, the priority number is displayed instead of the processor and memory priorities.

Examples:

Command	Response
MX	*SMCS ON DISK =308 PP=13, MP=13 "WAIT" STATUS *CANDE ON DISK =321 PP=12, MP=12 "WAIT" STATUS *RD ON DISK =310 PP=11, MP=11 "WAIT" STATUS *SYCOM ON DISK : *PS ON DISK =311 PP=9, MP=9 "WAIT" STATUS 6 PROGRAMS RUNNING...END MX/WY.
MX ALL	*SYSTEM/ODT ON DISK =304 PP=15, MP=15 EXECUTING *GEM/NC_15FEB ON DISK =303 PP=15, MP=15 EXECUTING *SMCS ON DISK =308 PP=13, MP=13 "WAIT" STATUS *CANDE ON DISK =321 PP=12, MP=12 "WAIT" STATUS *RD ON DISK =310 PP=11, MP=11 "WAIT" STATUS *SYCOM ON DISK : *PS ON DISK =311 PP=9, MP=9 "WAIT" STATUS 6 PROGRAMS RUNNING...END MX/WY.
321MX	*CANDE ON DISK =321 PP=12, MP=12 "WAIT" STATUS

NC (Network Controller)

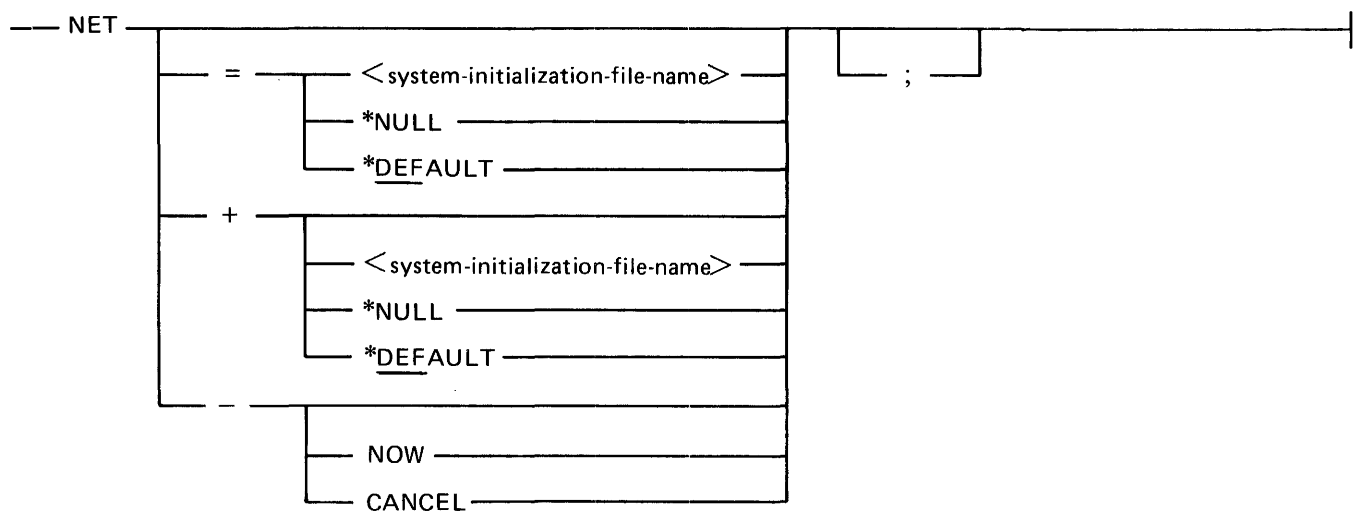
The NC system command communicates with the network controller. Refer to section 6 for the complete description of the NC system command.

NET (Network Mode)

The NET system command interrogates or changes the mode of the local B 1000 BNA system. Entering the NET system command without any additional options causes the current mode of the local B 1000 BNA system to be displayed.

Refer to the *B 1000 Systems Burroughs Network Architecture (BNA) Installation and Operation Manual* for a complete description of the B 1000 BNA system.

System ODT syntax:



Semantics:

<system-initialization-file-name>
: This field, which must contain a valid B 1000 filename, specifies the initialization file to be read.

CANCEL
: The CANCEL keyword causes the B 1000 BNA system to ignore the previous NET – system command and return to network mode.

*DEFAULT
: The *DEFAULT keyword changes the initialization file back to the default file name of BNA/NWINIT and uses that file name for initialization information.

NOW
: The NOW keyword causes an immediate shutdown of the B 1000 BNA system. If the NOW keyword is not specified, the B 1000 BNA system waits for any open ports to close and prevents any further traffic.

*NULL
: The *NULL keyword inhibits the use of an intialization file. Some other agent must supply the required commands for the initialization of the node into network mode.

Examples:

NET + BNA/INIT.FILE

NET – NOW

NET

NW (Network Message)

The NW system command causes a message to be routed to the Network Services Manager (BNA/NSM) program.

Remote ODT syntax:

```
---- NW <message> --+-----+------------------------------------|
                    |     |
                    +- ; -+
```

Semantics:

<message>
: This field must contain a valid BNA command and is routed to the BNA/NSM program. Refer to the *B 1000 Systems Burroughs Network Architecture (BNA) Installation and Operation Manual* for a complete description of the valid BNA commands.

Example:

NW ADD STATION NEWHIRE

OF (Optional File)

The OF system command informs the MCP that the specified file is optional and can be bypassed when a no-file condition occurs for a program with an optional file.

A optional file is an input file that has the OPTIONAL file attribute specified.

Remote ODT syntax:

```
— <mix-number>OF ─┬───────┬──────────────────────────────┤
                  └── ; ──┘
```

Workstation syntax:

```
— <usercode><remote ODT syntax> ─────────────────────────┤
```

Semantics:

<mix-number>
: This field must contain a mix number of a program waiting on a no-file condition and the file has the OPTIONAL file attribute specified.

Example:

MCP Message	Command
INVESTMENT/FORCAST ON DISK =8874 FILE CARDS (LABELED "SUPPLEMENT") NOT PRESENT	8874OF

OK (OK)

The OK system command causes the specified program to continue processing if the program was marked as WAITING.

The OK system command is used following operator correction of the following conditions.

DUPLICATE INPUT FILES

DUPLICATE FILE ON DISK

NO DISK

DUPLICATE DATA DECKS

FILE <file-identifier> NOT PRESENT

STOPPED (ST) PROGRAMS

WAIT STATUS — WAITING "OK"

If the corrective action is not taken before the OK system command is entered, the original MCP message is repeated.

Remote ODT syntax:

```
---- <mix-number> OK --+-----+-----------------------------------------|
                       |     |
                       +- ; -+
```

Workstation syntax:

```
---- <usercode><remote ODT syntax> ------------------------------------|
```

Semantics:

<mix-number>
This field must contain a mix number of a program that is currently marked as WAITING and for which action has been taken to correct the problem.

Examples:

MCP Message	Command
*DMPALL ON DISK =4573 DUPLICATE INPUT FILE "MASTER"	4573OK
MTC SAVED	4573OK

OL (Output Label)

The OL system command interrogates the status of peripheral units.

If an invalid <unit-type-code> is specified, or if no units of the specified type exist on the system, the MCP displays the following message.

NULL <unit-type-code> TABLE

For disk packs and cartridges, if a program is readying the pack, the mix number and the name of that program is reported.

Syntax:

```
--- OL ---+--- <unit-mnemonic> ---------+--+---------+--------------------|
          |                             |  |         |
          +--- <unit-type-code> --------+  +--- ; ---+
          |                             |
          +--- PSR ---------------------+
          |                             |
          +--- PACK <family name> ------+
```

Semantics:

<unit-mnemonic>
: This field must contain a valid unit mnemonic and causes the status of the specified unit to be displayed. For disk devices, the number of active users for the unit is also displayed.

<unit-type-code>
: This field must contain the initial characters of a unit mnemonic and causes the status of all the peripherals of the same type to be displayed.

The following are the valid <unit-type-codes>.

CD - Data Recorders
CP - Card Punch only
CR - Card Reader only
CS - Cassette
DC - Disk Cartridge
DK - Head-per-track Disk (5N)
DP - Disk Pack
FD - Floppy Disk
LP - Line Printer
MLC - Multiline Control
MT - Magnetic Tape
PP - Paper Tape Punch
PR - Paper Tape Reader
SLC - Single-Line Control
SR - Reader Sorter

PSR
The PSR keysymbol causes the current status of the pseudo readers to be displayed.

PACK <family-name>
The PACK keyword specifies that a disk identifier follows instead of unit mnemonic.

Examples:

Command	Response
OL CDA;	CDA NOT READY
OL MTC	MTC UNLABELED
OL DPA;	DPA LABELED USER (S) #130000
OL DPB	DPB LABELED USERPACK (U) #123456 BEING READIED BY SYSTEM/PANDA (123)
OL MTA	MTA LABELED MASTER [123456]
OL LP	LPA AVAILABLE FOR OUTPUT. LPB NOT READY
OL PACK GREEN	DPD LABELED GREEN (U) #112586 IS A "DL" DESIGNATION; USERS=5

OU (Output Unit)

The OU system command directs an output file to the specified output device.

The OU system command is used in response to the PUNCH REQUIRED ... or PRINTER REQUIRED... message to direct the file to backup.

The OU system command can also be used in a special-forms-required condition, and functions exactly the same as the FM system command. In this case, the OU system command overrides a saved condition on the specified device. This allows the system operator to mount the special form before it is actually required and save the device with the SV system command to prevent its use by other programs in the mix.

When a file with the SPECIAL FORMS file attribute set is closed, the device to which it is assigned is saved automatically by the MCP, thus preventing other programs from accidentally using the special form before it can be removed by the operator.

Remote ODT syntax:

```
── <mix-number> OU ─┬─ <unit-mnemonic> ─────┬─┬─────┬──────────────────┤
                    └─ PACK <family-name> ──┘ └─ ; ─┘
```

Workstation syntax:

```
── <usercode><remote ODT syntax> ──────────────────────────────────────┤
```

Semantics:

<mix-number>
: This field must contain a mix number of a program that has an output file that is opened and that requires an output device.

<unit-mnemonic>
: This field, which must contain a valid output device unit mnemonic, specifies the unit to use for the output file that requires an output device.

PACK <family-name>
: The PACK keyword specifies that a disk identifier follows instead of a unit mnemonic.

Examples:

1219OU LPA;

2317OU MTC

2400OU PACK DATACOMM

PASSWORD (Password)

The PASSWORD command permanently changes the password associated with a usercode. The PASSWORD command requires that the command end with the end of text, that is, another command cannot follow the PASSWORD command.

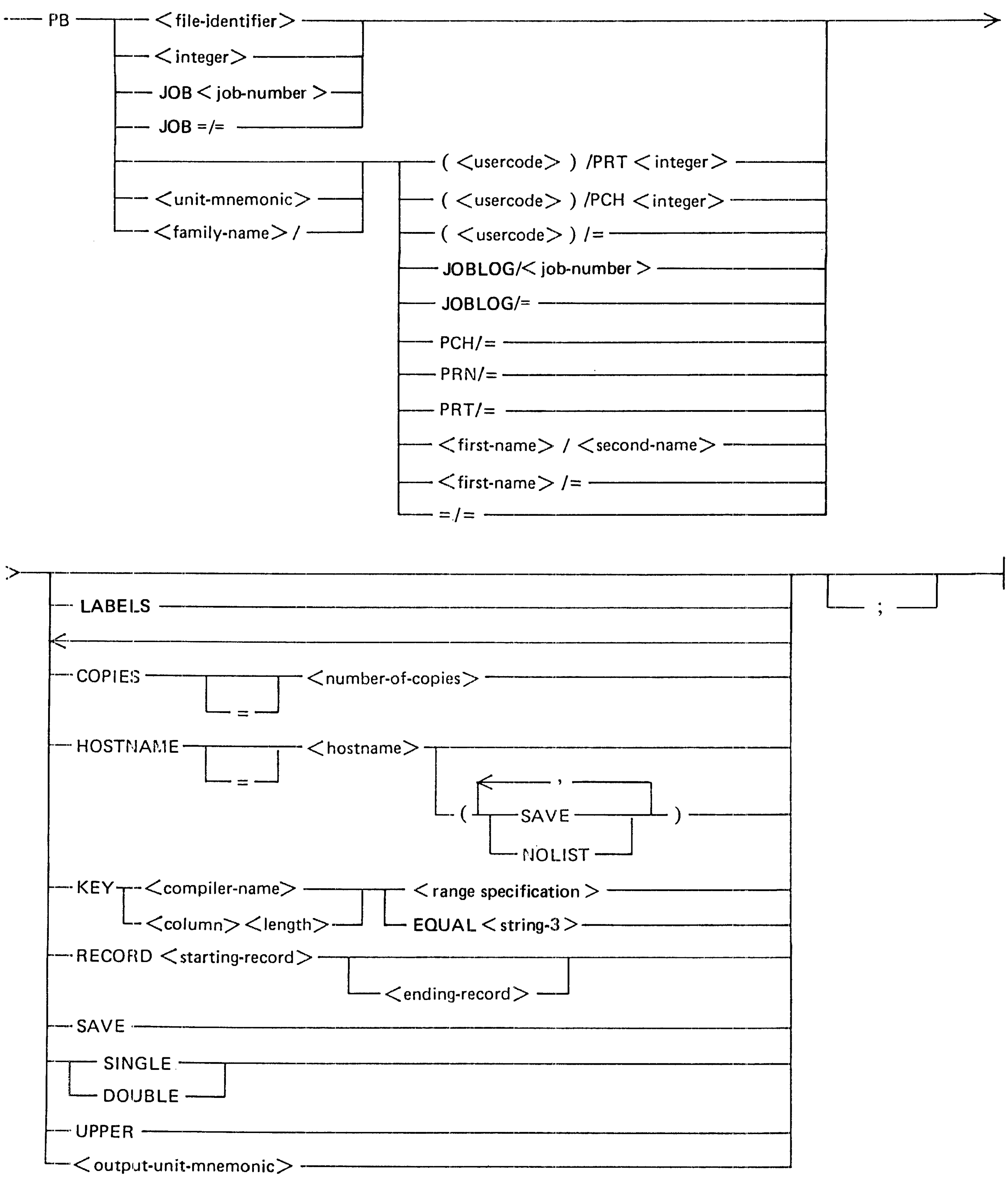
Refer to the *B 1000 Systems Work Flow Language (WFL) Language Manual* for more information.

PB (Print Backup)

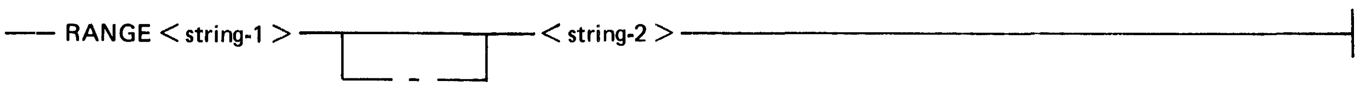
The PB system command initiates the SYSTEM/BACKUP program to print or punch a disk or tape backup file. If the DL BACKUP designate is not system disk, both the DL BACKUP designation and the system disk are searched. For usercoded PB requests, both the usercode default pack and the system disk are searched if the usercode default pack is not the system disk.

It is possible to print a backup file while it is being created if the file attribute PROTECTION has been set to a value of PROTECTED by the program creating the backup file.

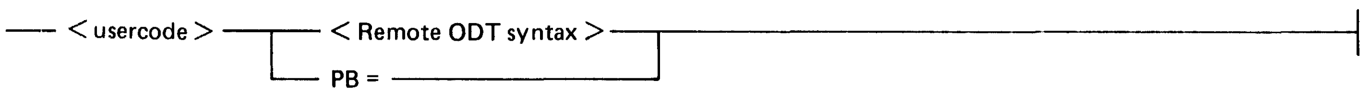
Remote ODT syntax:



<range specification> syntax:



Workstation syntax:



Semantics:

<compiler-name>
    This field must contain a valid compiler name and causes the automatic generation of the proper column number and length pair that corresponds to the sequence number field of the output listing produced by the compiler specified.

<column>
    This field, which must contain an integer in the range 1 to 132 inclusive, specifies the beginning column number of the subfield to be used for the compare argument when the KEY keyword is specified.

<ending-record>
    This field must contain a relative record number of a record in the backup file and specifies the last record to be printed. Printing begins with the relative record number specified by <starting-record>. This field is used in conjunction with the RECORD keyword.

<family-name>
    This field must contain a valid disk identifier of a user disk that contains the backup file to be printed or punched.

<file-identifier>
    This field specifies the name of the backup file to be printed or punched. Refer to file identifier in Section 1 for a complete description of file identifier.

<first-name>
    This field, which must contain a valid first name, specifies the first part of the file name of the backup file to be printed or punched.

<hostname>
    This field, which must contain a valid BNA hostname, specifies the host system in which the backup file is to be printed. This field is used in conjunction with the HOSTNAME keyword.

<integer>
    This field, which must contain an integer, specifies the backup file number to be printed or punched. The backup file must have a default name of BACKUP/PRT<integer> or BACKUP/PCH<integer>.

<job-number>
    This field, which must contain a WFL job number, specifies joblog files to be printed.

<length>
This field, which must contain an integer in the range 0 to 10 inclusive, specifies the length of the subfield to be used for the compare argument when the KEY keyword is specified.

<number-of-copies>
This field, which must contain an integer, specifies the number of copies of the backup file is to be printed or punched.

<output-unit-mnemonic>
This field, which must contain a valid line printer, card punch, or magnetic tape unit mnemonic, specifies the unit to which the output is to be directed.

<second-name>
This field, which must contain a valid file identifier, specifies the subdirectory name of the backup file to be printed or punched.

<starting-record>
This field, which must contain a valid relative record number within the backup file, specifies the record in which to begin printing or punching the file. This field is used in conjunction with the RECORD keyword.

<string-1>
This field, which must contain a string of characters having a maximum length of <length>, is specified with the RANGE keyword. Printing or punching begins when an exact comparison is made between the subfield and <string-1>. If <string-1> consists of all numeric characters, it need not be quoted, and printing or punching starts when the subfield reaches or exceeds <string-1>. Printing or punching continues until an exact comparison is made between the subfield and <string-2>, or until the end of file is reached.

<string-2>
This field, which must contain a string of characters having a maximum length of <length>, is specified with the RANGE keyword. Printing or punching begins when an exact comparison is made between the subfield and <string-1>. Printing or punching continues until an exact comparison is made between the subfield and <string-2>, or until the end-of-file record is read. If <string-2> consists of all numeric characters, it need not be quoted; printing or punching stops when the subfield equals or exceeds <string-2>.

<string-3>
This field, which must contain a string of characters having a maximum length of <length>, is specified with the EQUAL keyword. Printing or punching begins when an exact comparison is made between the subfield and <string-3> and continues until the end-of-file record is read. Strings of all numeric characters need not be quoted.

<unit-mnemonic>
This field, which must contain a valid magnetic tape or user disk unit mnemonic, specifies the input device on which the backup print or punch file exists.

<usercode>
This field, which must contain a valid usercode, specifies the first name portion of the backup file name in which to print or punch the file.

COPIES
The COPIES keyword causes the SYSTEM/BACKUP program to print or punch the number of copies of the backup file specified by <number-of-copies>.

DOUBLE
The DOUBLE keyword causes the SYSTEM/BACKUP program to double space the entire printer listing, overriding any carriage control specified in the backup printer file.

EQUAL
The EQUAL keyword causes the SYSTEM/BACKUP program to begin printing or punching the backup file when an exact comparison is made between the subfield and <string-3>, and continues printing or punching the backup file until the end-of-file record is read.

HOSTNAME
The HOSTNAME keyword causes the SYSTEM/BACKUP program to transfer the backup file to the BNA host system with <hostname> as the hostname.

KEY
The KEY keyword causes the SYSTEM/BACKUP program to print or punch a range of records according to information within the backup-file records; for example, sequence number. The portion of each record to be compared can be specified, as well as the information that starts and stops the output.

JOB
The JOB keyword causes the SYSTEM/BACKUP program to format and print the WFL job summary, dependent on the setting of the JOBSUMMARY attribute of the job. The backup files created by all tasks initiated by the WFL job are also printed.

If the =/= keysymbol is specified, this information is produced for all WFL jobs whose joblog files are resident.

JOBLOG
The JOBLOG keyword causes the SYSTEM/BACKUP program to format and print a specific WFL joblog file or all resident joblog files.

LABELS
The LABELS keyword causes the SYSTEM/BACKUP program to print the label record of the backup file.

NOLIST
The NOLIST keyword causes the SYSTEM/BACKUP program to notify the receiving BNA host system that the backup file is not to be printed or punched.

PCH/=
The PCH/= keysymbol causes the SYSTEM/BACKUP program to punch all the backup punch files with the default punch backup file name of BACKUP/PCH<integer>.

PRN/=
The PRN/= keysymbol causes the SYSTEM/BACKUP program to print all the backup print files with the default printer backup file name of BACKUP/PRT<integer>.

PRT/=
The PRT/= keysymbol causes the SYSTEM/BACKUP program to print all the backup print files with the default printer backup file name of BACKUP/PRT<integer>.

RANGE
The RANGE keyword causes the SYSTEM/BACKUP program to begin printing or punching when a comparison is made between the subfield and <string-1>. The printing and punching continues until a comparison is made between the subfield and <string-2>, or until the end-of-file record is read.

RECORD

The RECORD keyword causes the SYSTEM/BACKUP program to print a range of records beginning with <starting-record> and ending with <ending-record>. If <ending-record> is not specified, all records from <starting-record> to the end of the file are printed. If the RECORD keyword is not specified, all records in the file are printed. The RECORD keyword is not valid when an equal sign (=) character is used as part of a file specifier.

SAVE

The SAVE keyword is used in two places in the PB system command syntax.

If the SAVE keyword is specified in the HOSTNAME portion of the PB system command syntax, the SYSTEM/BACKUP program notifies the receiving BNA host system to save the backup file. The receiving BNA host system makes the final determination of whether or not to save the backup file.

If the SAVE keyword is specified after the backup file name, the SYSTEM/BACKUP program does not remove the file after the backup file is printed or punched.

SINGLE

The SINGLE keyword causes the SYSTEM/BACKUP program to single space the entire backup printer file, overriding any carriage control instruction in the backup printer file.

UPPER

The UPPER keyword causes the SYSTEM/BACKUP program to translate all lower-case characters to upper-case characters before printing.

=/=

The =/= keysymbol causes all the backup files with the default printer backup name of BACKUP/PRT<integer> to be printed and all backup files with the default backup name of BACKUP/PCH<integer> to be punched.

=

The = keysymbol is optionally used with the COPIES and HOSTNAME keywords. The = keysymbol in the workstation syntax causes all backup files associated with <usercode> to be printed or punched.

NOTE

If both the RECORD and KEY keywords are specified, the comparisons specified by the KEY keyword are made only in the range of records specified by the RECORD keyword.

Examples:

```
PB 125;

PB 17 LPA SAVE;

PB DCC 4 RECORD 5;

PB MTA =/=;

PB 3 KEY COBOL RANGE 123 567;

PB 2 KEY 7 6 EQUAL "ABC";

PB 53 RECORD 1 100 DOUBLE SAVE;

PB 24 SAVE HOSTNAME THERE (SAVE);

PB PRT/= COPIES=2 LPB;
```

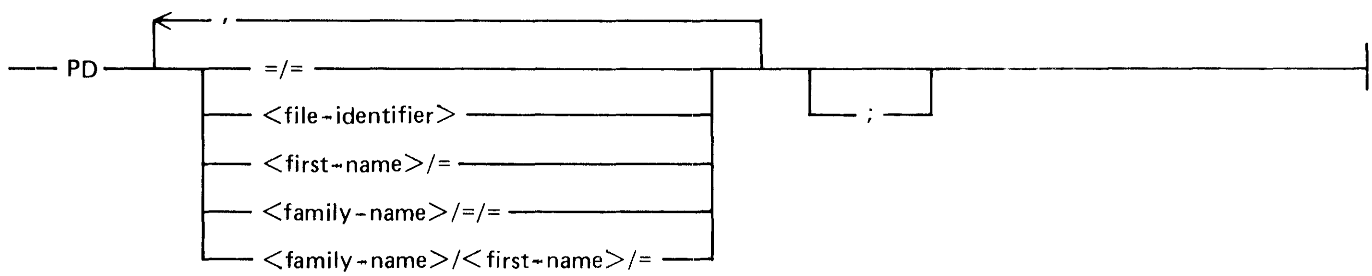
PD (Print Directory)

The PD system command causes the specified files to be displayed or interrogates a disk directory for a specific file(s).

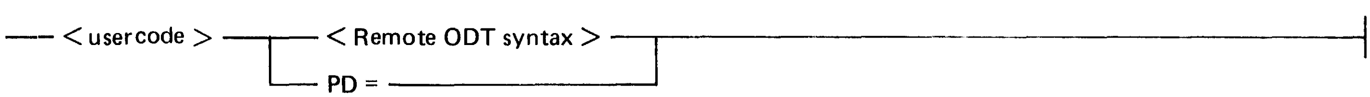
If the file name is not present in the disk directory, the MCP responds with the message: <file-identifier> NOT IN DIRECTORY.

The specific commands PD =/= and PD <family-name>/=/= cause the program in the PAN name table slot to execute and print an alphabetized printer listing of the files. These two commands are not allowed if the program in the PAN slot is not present.

Remote ODT syntax:



Workstation syntax:



Semantics:

<family-name>
This field, which must contain a disk identifier, specifies the user disk on which to interrogate the disk directory.

<first-name>
This field, which must contain a first name, specifies the first part of a file name.

=/=
The =/= keysymbol causes all the files on the user disk or SYSTEM disk to be displayed if this command is issued under a usercode. Otherwise, the SYSTEM/PANDA program is called to do the PD. In this case, if the SYSTEM/PANDA program is not present, then an error message is displayed.

=
The = keysymbol in the workstation syntax causes all of the files associated with the specified <usercode> to be displayed.

Examples:

Command	Response
PD COBOLZ;	COBOLZ NOT IN DISK DIRECTORY END PD.
PD FORTRAN77;	PD= FORTRAN77 END PD.
PD USER/MASTER/=;	PD= USER/MASTER/FILE PD= USER/MASTER/TEST PD= USER/MASTER/PROG END PD.
PD DMPALL, COBOL74, RPG;	PD= DMPALL PD= COBOL74 PD= RPG END PD.

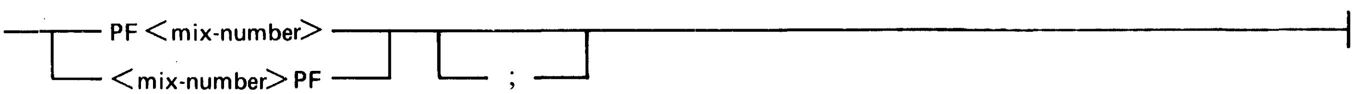
PF (Print Fetch)

The PF system command displays messages from a task that contains a Work Flow Language (WFL) FETCH specification and is awaiting a fetch action. Such tasks are entered in the waiting schedule awaiting an OK system command and the following message is displayed.

JOB <mix-number> CONTAINS FETCH MESSAGE; "PF" REQUESTED

The PF system command can then be entered or can be bypassed by entering the OK system command. The OK system command makes the task eligible to be selected for execution.

Syntax:



Semantics:

<mix-number>
This field must contain a mix number of a task in the waiting schedule that requires a fetch action.

Example:

Command	Response
2391 PF	2391 FETCH: SAMPLE FETCH MESSAGE.

PG (Purge)

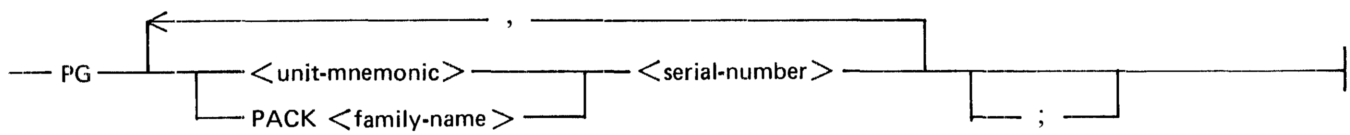
The PG system command purges a user disk or magnetic tape.

A purged user disk is marked as UNRESTRICTED and its disk identifier remains unchanged.

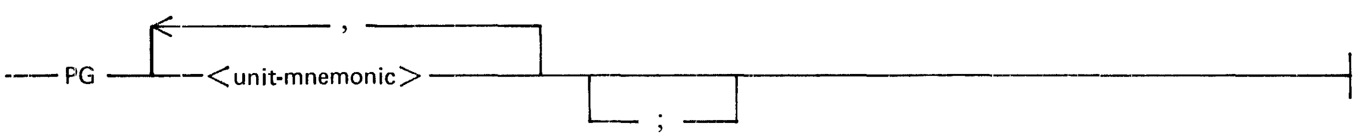
A magnetic tape must have a write ring in place in order to be purged.

The serial number of a magnetic tape is not changed when the magnetic tape is purged. To assign or change the serial number of magnetic tape, use the SN system command.

Remote ODT disk syntax:



Remote ODT tape syntax:



Semantics:

<unit-mnemonic>
: This field must contain a user disk or magnetic tape unit mnemonic. This mnemonic specifies the unit to be purged.

PACK <family-name>
: The PACK keyword specifies that a disk identifier follows instead of a unit mnemonic.

<serial-number>
: This field must contain the six-digit serial number of the user disk to be purged. This field is not used for magnetic tape.

Examples:

PG DPA 000456

PG MTC, MTD;

PM (Process Memory Dump)

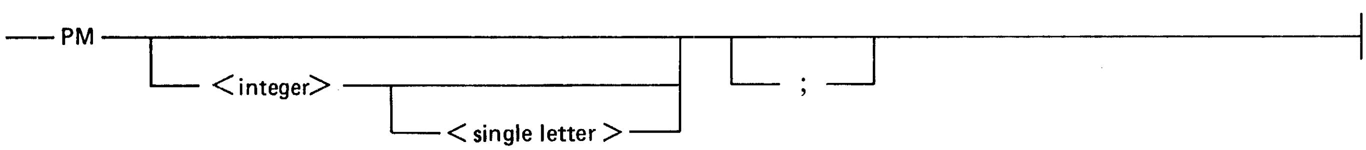
The PM system command allows a system operator to analyze and print a program dump file or package a system dump file.

A program dump has the name DUMPFILE/<integer> or (<usercode>)/DMP<integer>. When the PM system command is entered with an <integer> as a parameter, the SYSTEM/IDA program is initiated. The SYSTEM/IDA program analyzes and prints the contents of the dump file.

A system dump file has the name SYSTEM/DUMPFILE and resides on the pack defined by the DL SYSDUMP designation. If the PM system command does not include an <integer>, the SYSTEM/IDA program is initiated. The SYSTEM/IDA program packages the contents of SYSTEM/DUMPFILE. The packaged dump file has the name DUMPFILE/PM<nnn>; however, the operator can file-equate the internal file PM to a different name when the PM system command is entered. "Packaging" means that the file SYSTEM/DUMPFILE is combined with additional information about the system into a file that can be fully analyzed at a later time, possibly on another system.

The SYSTEM/IDA program must be located on the SYSTEM disk to use the PM system command.

Remote ODT syntax:



Workstation syntax:

Semantics:

<integer>
: This field, which must contain an integer, specifies the number of the program dump file to be analyzed. The dump file must have the name DUMPFILE/<integer>.

<single-letter>
: A single letter, which immediately follows the integer with no intervening spaces, specifies the run-limit dump to be analyzed.

SYSTEM/IDA

Switch	Value	Result
0	0	Analyze only the first 64 elements of each array.
	1	Analyze all elements of each array.
	2	Do not analyze array elements.
1	0	Allow comparison of resident code, interpreter, and microcode segments to their copies on disk.
	1	Suppress code segment comparison.
2	0	Display DMS and ISAM buffers.
	1	Suppress DMS and ISAM buffer data only.
	2	Suppress DMS and ISAM buffer descriptors and data.
3	0	Suppress printing of certain (already analyzed) memory areas during hexadecimal dump.
	1	Print all areas of memory during hexadecimal dump.
4	0	Remain in loop unil exit conditions are satisfied.
	1	Decrement switch 4 and exit loop unconditionally.
5	0	Analyze all ODT queue entries.
	1	Analyze only the last 25 percent of the ODT queue.
6	0	Print available memory areas during hexadecimal dump.
	1	Suppress printing of available memory areas.
7		Reserved for development use.
8	0	Abort analysis if the MCP level is incorrect.
	1	Attempt system dump analysis regardless of MCP level.
9	0	Default option UPPERCASE = ON.
	1	Default options UPPERCASE and DOUBLESPACE = OFF
	2	Default options UPPERCASE and DOUBLESPACE = ON
	3	Default option DOUBLESPACE = ON

Examples:

```
PM ; SW 6=1; FI PM NAM ELEVEN/HALT

PM 3459

PM 7403A
```

PO (Power Off)

The PO system command informs the MCP that a user disk or Phase-Encoded (PE) tape is to be removed from the system.

The PO system command is invalid for a SYSTEM disk.

When B 9484 or B 9486 disk drives are in use, the MCP attempts to physically power down the unit requested. When B 9495 or B 9496 tape units are attached to a B 1394 or B 1495 tape control, the tape is unloaded if it is not in use. The PO system command is ignored for other types of units.

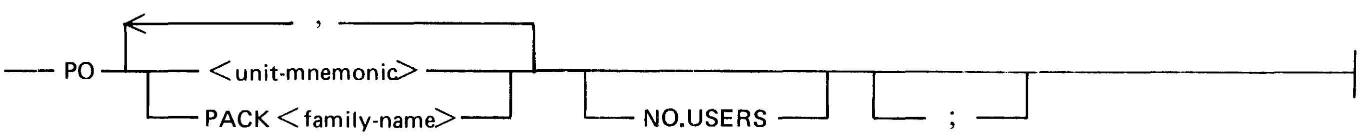
If a PO system command is entered for a user disk currently in use, the following message is displayed:

<unit-mnemonic> HAS <integer> USERS - CANNOT "PO".

This means that a request to power off a pack with a user count greater than 0 is rejected unless the NO.USERS option is specified. When the NO.USERS option is specified, the system accepts the PO command for packs with a user count greater than or equal to 0. The pack is powered off when the user count becomes 0.

The PO system command can be used on a multipack file base pack if there are no single-pack files in use at the time of the request.

Remote ODT syntax:



Semantics:

<unit-mnemonic>
: This field, which must contain a valid tape or user disk unit mnemonic, specifies the unit to power off.

PACK
: The PACK keyword specifies that a disk identifier follows instead of a unit mnemonic.

<family-name>
: This field, which must contain a valid name of a user disk, specifies the disk unit to power off.

NO.USERS
: This option specifies that the user disk is to be powered off when the user count becomes 0.

Examples:

Command	**Response**
PO DPB	DPB IS NOW OFFLINE
PO MTC;	(No response is generated for magnetic tape)
PO PACK PAYROLL	DPC IS NOW OFFLINE
PO DPC, DPD	DPD IS NOW OFFLINE DPC IS NOW OFFLINE
PO DPD NO.USERS	DPD IS NOW OFFLINE

PP (Processor Priority)

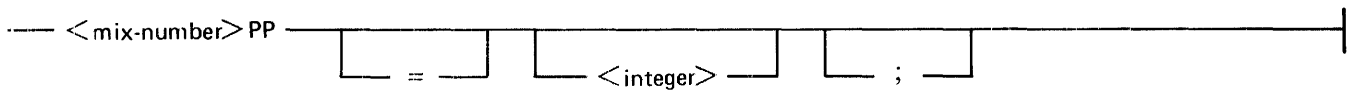
The PP system command interrogates or changes the PROCESSOR.PRIORITY of a program currently in the mix.

The PP system command is valid only when the MPRI MCP option is set.

If <integer> is omitted, the MCP displays the current value of the PROCESSOR.PRIORITY for the specified program.

Refer to the PROCESSOR.PRIORITY program control instruction in Section 4 for further information on PROCESSOR.PRIORITY.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number>
: This field, which must contain a mix number of a program currently in the mix, specifies the program to interrogate or that the PROCESSOR.PRIORITY attribute is to be changed.

<integer>
: This field, which must contain an integer in the range 0 to 15 inclusive, specifies the value of the PROCESSOR.PRIORITY attribute. The default value is 4.

Examples:

Command	Response
9203PP	*DMPALL ON DISK =9203 PP=7
1276PP 12;	*NDL/HANDLER ON DISK =1276 PROCESSOR PRIORITY CHANGED TO 12

PQ (Purge Queue)

The PQ system command flushes all scheduled jobs from a specific job queue while leaving the queue existent.

Syntax:

```
—— PQ <number> ————————————————————————————————————————|
```

Example:

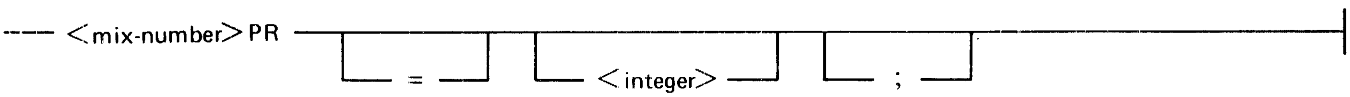
```
PQ 0
 JOBS PURGED FROM JOB QUEUE 0.
```

PR (Priority)

The PR system command changes the PROCESSOR.PRIORITY attribute of a program currently in the mix. This command can also be used to interrogate the Processor and Memory priorities of a program.

If <integer> is omitted, the MCP displays the current value of the MEMORY.PRIORITY and PROCESSOR.PRIORITY attributes for the specified program. If the MPRI MCP option is reset, these two priority values are considered to be the same and are displayed as one value labeled PR.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number>
: This field, which must contain a mix number of a program currently in mix, specifies the program for which the PR system command is to be applied to.

<integer>
: This field, which must contain an integer in the range 0 to 15 inclusive, specifies the new value of the PROCESSOR.PRIORITY attribute for the program.

Examples:

Command	Response
1987PR;	*DMPALL ON DISK =1987 PP=7, MP=7
2987PR 13;	*NDL/HANDLER ON DISK =2987 PRIORITY CHANGED TO 13

PV (Pack Override)

The PV system command interrogates or resets the user-disk override bit in the (SYSTEM)/ USERCODE file, and checks to see if the user disk to which a specific usercode has been assigned is present.

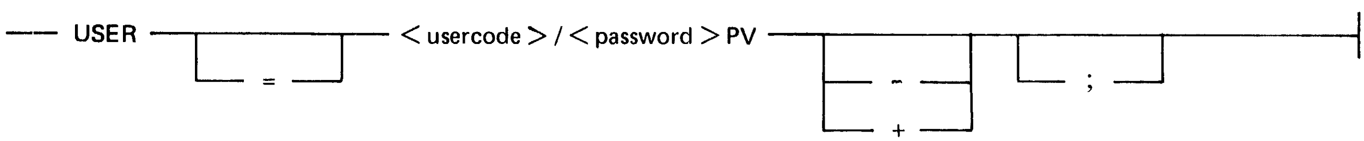
The user-disk bit is set when either of the following conditions occur.

1. USER <usercode>/<password> is used to execute a program and the default user disk is not on line.
2. A file whose first name is (<usercode>) is opened and the default user disk is not on line.

The user-disk override bit remains on for that usercode until reset with a PV system command. When the user-disk override bit is set, the SYSTEM disk becomes the default disk for that usercode, even if the original user disk is made available.

System ODT syntax:

Remote ODT syntax:



Semantics:

<usercode> and <password>
: These fields can contain any valid usercode/password pair. The usercode/password pair defines which user disk, if any, will be interrogated and causes the user-disk override bit to be set or reset.

PV
: Entering this instruction interrogates the user-disk override bit for <usercode>/<password> if neither the minus sign (–) character nor the plus sign (+) character is present. If the minus sign (–) character is specified, the user-disk override bit is reset. If the plus sign (+) character is specified, the user-disk override bit is set.

PV – ALL
: Entering this instruction is valid only from an ODT and causes the user-disk override bit for all usercodes to be reset.

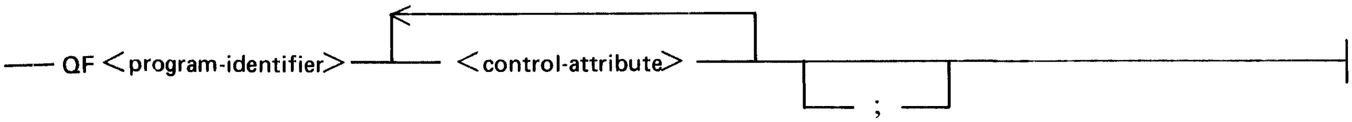
Example:

Command	Response
US SMITH/R PV;	(SMITH) DEFAULT PACK IS "CIS", PACK OVERRIDE IS SET
US SMITH/R PV–;	THE PACK OVERRIDE BIT HAS BEEN RESET FOR ALL OCCURRENCES OF (SMITH).
US SMITH/R PV+	THE PACK OVERRIDE BIT HAS BEEN SET FOR ALL OCCURRENCES OF (SMITH).
PV – ALL;	THE PACK OVERRIDE BIT HAS BEEN RESET FOR ALL USERCODES.

QF (Query File)

The QF system command interrogates a program on disk concerning the status of its control attributes.

Remote ODT syntax:



Workstation syntax:

Semantics:

<program-identifier>
: This field, which must contain a program name of a program that currently exists in the disk directory, specifies the name of the program to interrogate.

<control-attribute>
: This field, which must contain a valid program control instruction, specifies the control attribute to interrogate. Refer to Section 4 for a description of program control instructions.

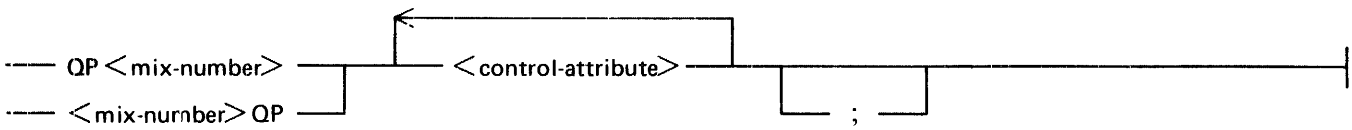
Examples:

Command	Response
QF DMPALL CG;	QF *DMPALL ON DISK: CHARGE NUMBER = 999999
QF RPG FILE LINE BACKUP;	QF *RPG ON DISK: IN "LINE" BACKUP.STATUS = HARDWARE OR BACKUP.DISK OR BACKUP.TAPE

QP (Query Program)

The QP system command interrogates an executing or scheduled program for the status of its control attributes.

Syntax:



Semantics:

<mix-number>
: This field, which must contain a mix number of an executing or scheduled program, specifies the program to interrogate the control attributes.

<control-attribute>
: This field, which must contain a valid program control instruction, specifies the control attribute to interrogate. Refer to Section 4 for a description of program control instructions.

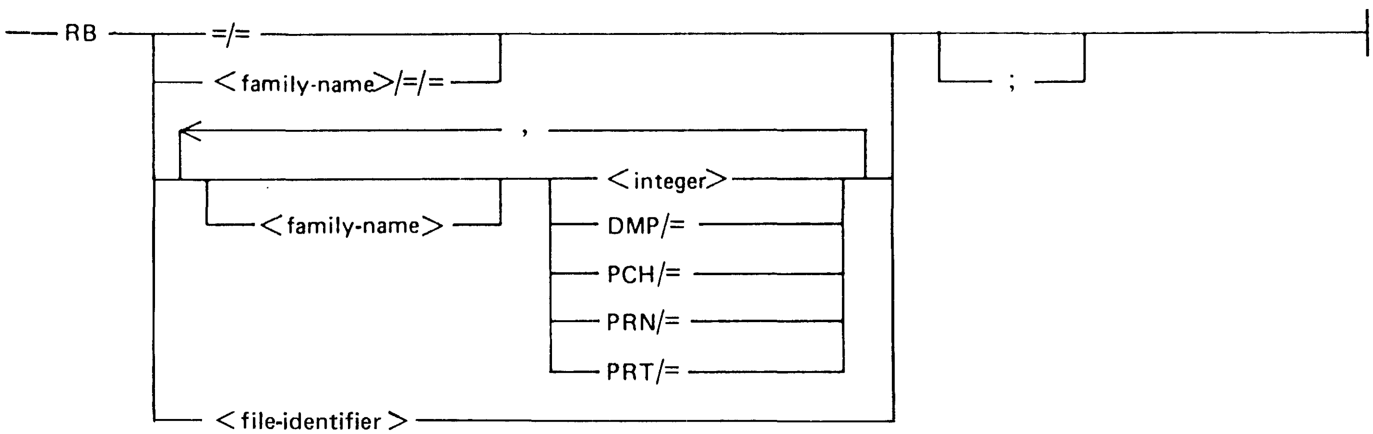
Examples:

Command	Response
QP 14 CHARGE FREEZE	QP *DMPALL ON DISK: CHARGE = 31404 QP *DMPALL ON DISK: FREEZE FLAG = 0
QP 15 FILE LINE LAB	QP *SYSTEM/COMPARE ON DISK: IN "LINE" LABEL TYPE = UNLABELED
16 QP MEMORY;	QP *CANDE ON DISK: DYNAMIC MEMORY SIZE = 5760

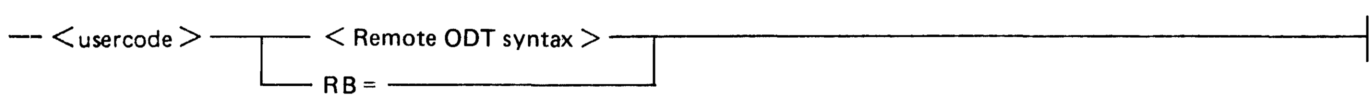
RB (Remove Backup)

The RB system command removes backup and memory dump files from disk. The RB system command functions identically to the RF system command. If the DL BACKUP designate is not system disk, both the DL BACKUP designation and system disk are searched. For usercoded RB requests, the system disk is searched if the usercode default pack is not DISK.

Remote ODT syntax:



Workstation syntax:



Semantics:

<family-name>
: This field, which must contain a valid disk identifier, specifies the user disk which contains the backup files to be removed.

<integer>
: This field, which must contain an integer, specifies the backup file number to be removed. The backup file must have the default name of BACKUP/PRT<integer>, BACKUP/PCH<integer>, or DUMPFILE/<integer> in order to be removed.

DMP/=
: The DMP/= keysymbol causes all the dump files with the default name of DUMPFILE/<integer> to be removed.

PCH/=
: The PCH/= keysymbol causes all the punch files with the default name of BACKUP/PCH<integer> to be removed.

PRN/=
: The PRN/= keysymbol causes all the printer files with the default name of BACKUP/PRT<integer> to be removed.

PRT/=
The PRT/= keysymbol causes all the printer files with the default name of BACKUP/PRT<integer> to be removed.

=/=
The =/= keysymbol causes all the dump, printer, and punch backup files to be removed. The backup files must have the default name of DUMPFILE/<integer>, BACKUP/PCH<integer>, and BACKUP/PRT<integer> in order to be removed.

<file-identifier>
An actual file name may be provided; the file is removed if it is a backup file.

=
The = keysymbol in the workstation syntax causes all printer backup, punch backup, and dump files associated with <usercode> to be removed.

Examples:

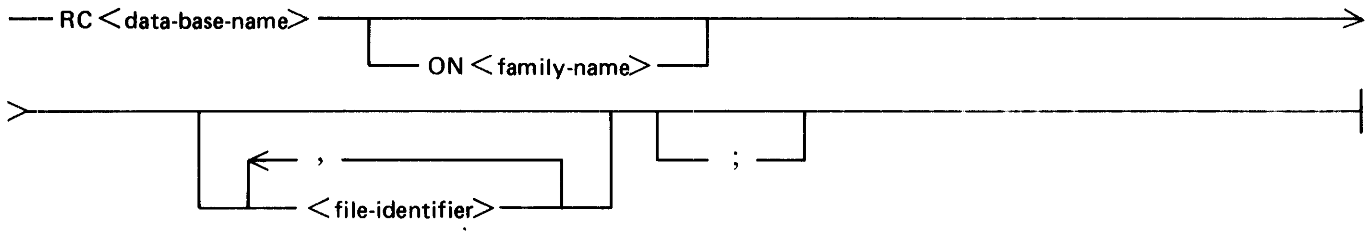
Command	**Response**
RB 37;	DISK/BACKUP/PRT37 REMOVED
RB =/=;	DLPACK/BACKUP/PRT12 REMOVED DLPACK/DUMPFILE/32 REMOVED DISK/BACKUP/PCH10 REMOVED
RB PCH/=;	DLPACK/BACKUP/PCH23 REMOVED DISK/BACKUP/PCH24 REMOVED
RB USER/=/=;	USER/BACKUP/PRT12 REMOVED
RB USER/215/;	USER/DUMPFILE/215 REMOVED
USER SITE/A RB PRT/=;	D/(SITE)/PRT12 REMOVED D/(SITE)/PRT13 REMOVED

RC (Recover Data Base)

The RC system command is used in conjunction with DMSII audit and recovery to initiate recovery on a data base. The DMS/RECOVERDB program is initiated to recover the data base and must be present on the SYSTEM disk.

The list of <file-identifiers> allows a partial dump recovery to be performed on the specified DMSII files. This can be done if a subset of the data base, excluding the data base dictionary, has been lost or corrupted. Partial dump recovery requires that both a current copy of the dictionary and a backup copy corresponding to the files to be recovered be present on disk. The old dictionary must be labeled <data-base-name>/OLD-DICT.

Remote ODT syntax:



Semantics:

<data-base-name>
: This field, which must contain a data base name, specifies the name of the DMSII data base to recover.

<family-name>
: This field, which must contain a disk identifier, specifies the user disk on which the data base dictionary is located.

<file-identifier>
: This field, which must contain a valid file identifier, specifies the name of the DMSII file on which to perform a partial dump recovery. If the file is located on the SYSTEM disk, the <file-identifier> must be in the form of <data-base-name>/<file-name>. If the file is located on a user disk, the <file-identifier> must be in the form of <family-name>/<data-base-name>/<file-name>.

Examples:

RC STUDENTDB;

RC PAYROLL ON USER1;

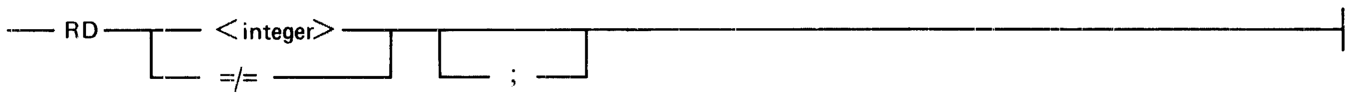
RC UNIV UNIV/FILE1, UNIV/FILE2, UNIV/FILE3;

RC UNIV ON USER USER/UNIV/FILE1, USER/UNIV/FILE2, USER/UNIV/FILE3;

RD (Remove Decks)

The RD system command removes pseudo-reader files from disk. If a pseudo-reader file is currently in use by a pseudo reader, the file is not removed.

Remote ODT syntax:



Semantics:

<integer>
    This field, which must contain an integer, specifies the pseudo-reader file number to remove.

=/=
    The =/= keysymbol causes all pseudo-reader files to be removed.

Examples:

Command	Response
RD 1;	DECK/1 REMOVED
RD =/=;	DECK/1 REMOVED DECK/2 REMOVED DECK/3 REMOVED

RE (Remove)

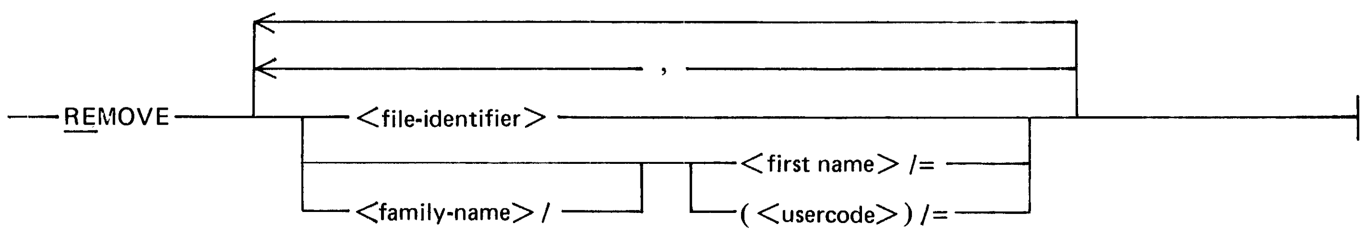
The REMOVE system command deletes specified files from the disk directory and makes the file space available to the MCP. The /= form deletes the main directory entry and all the files in its subdirectory. The following syntax diagram describes the Control Card syntax. When the WFL option is set, the WFL syntax is used. For the WFL syntax of the REMOVE ODT-command, refer to the *B 1000 Systems Work Flow Language (WFL) Language Manual.* For more information about the WFL option please refer to the WFL System Command or the WFL System Option in this document.

If <file-identifier> resides on a user disk, the disk identifier must precede the file name in order for the MCP to locate the correct file. When the disk identifier is not included, the MCP assumes that the file resides on the SYSTEM disk. One exception to this assumption occurs when the REMOVE system command is prefaced by the USER system command. In this case, the disk identifier for the REMOVE system command is taken from the (SYSTEM)/USERCODE file.

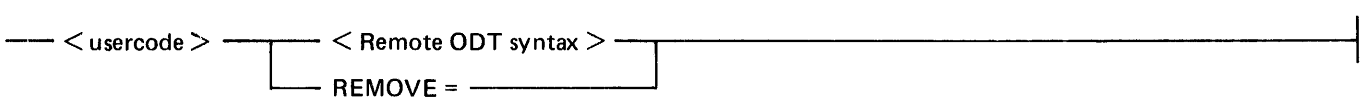
The REMOVE system command must be preceded by the USER system command with the required usercode/password combination when it is desired to remove PRIVATE files from disk.

If the REMOVE system command is entered by way of a card deck, additional cards can be included provided the last file to be removed has the semicolon (;) character following the REMOVE <file-identifier> statement.

Remote ODT syntax:



Workstation syntax:



Semantics:

<family-name>
: This field, which must contain a valid B 1000 disk identifier, specifies the name of the user disk on which the file resides.

<first-name>
: This field, which must contain a valid B 1000 first name, specifies the main directory name for the file.

=:

The = keysymbol in the workstation syntax causes all of the files associated with the specified <usercode> to be removed.

Examples:

REMOVE A/B

CC REMOVE USER/MASTER/FILE

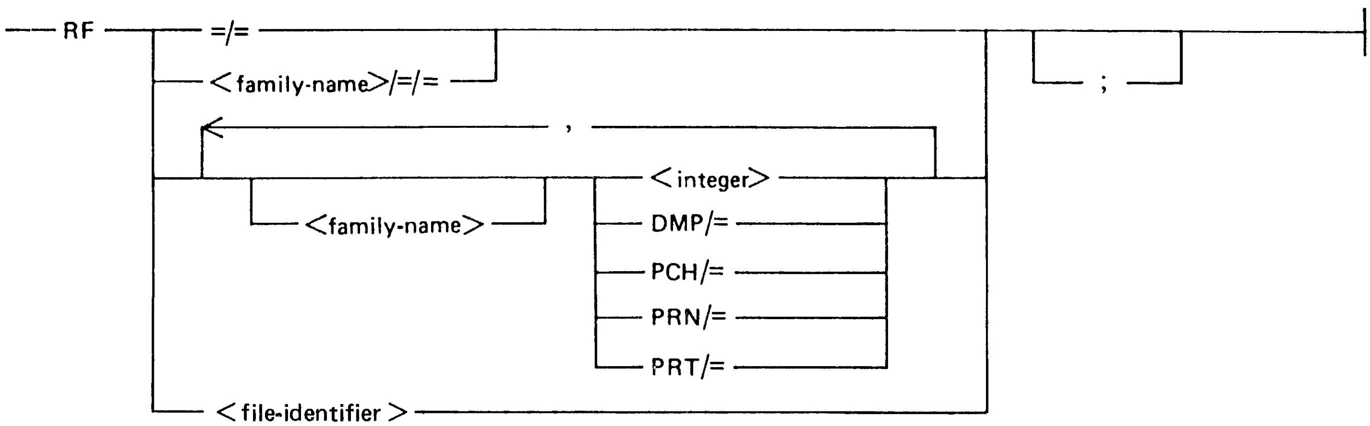
RE A, B, C, D;

USER FINANCE/ACCT RE FILE1, FILE2

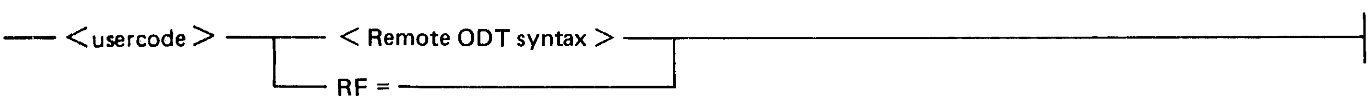
RF (Remove Files)

The RF system command removes backup and memory dump files from disk. The RF system command functions identically to the RB system command. If the DL BACKUP designate is not system disk, both the DL BACKUP designation and system disk are searched. For usercoded RB requests, the system disk is also searched if the usercode default pack is not DISK.

Remote ODT syntax:



Workstation syntax:



Semantics:

<family-name>
: This field, which must contain a valid disk identifier, specifies the user disk that contains the backup files to be removed.

<integer>
: This field, which must contain an integer, specifies the backup file number to be removed. The backup file must have the default name of BACKUP/PRT<integer>, BACKUP/PCH<integer>, or DUMPFILE/<integer> in order to be removed.

DMP/=
: The DMP/= keysymbol causes all the dump files with the default name of DUMPFILE/<integer> to be removed.

PCH/=
: The PCH/= keysymbol causes all the punch files with the default name of BACKUP/PCH<integer> to be removed.

PRN/=
: The PRN/= keysymbol causes all the printer files with the default name of BACKUP/PRT<integer> to be removed.

PRT/=
The PRT/= keysymbol causes all the printer files with the default name of BACKUP/PRT<integer> to be removed.

=/=
The =/= keysymbol causes all the dump, printer, and punch backup files to be removed. The backup files must have the default name of DUMPFILE/<integer>, BACKUP/PCH<integer>, and BACKUP/PRT<integer> in order to be removed.

<file-identifier>
An actual file name may be provided; the file is removed if it is a backup file.

=
The = keysymbol in the workstation syntax causes all printer backup, punch backup, and dump files associated with <usercode> to be removed.

Examples:

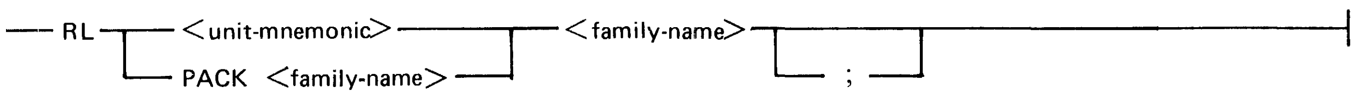
Command	Response
RF 37;	DISK/BACKUP/PRT37 REMOVED
RF =/=;	DLPACK/BACKUP/PRT12 REMOVED DLPACK/DUMPFILE/32 REMOVED DISK/BACKUP/PCH10 REMOVED
RF PCH/=;	DLPACK/BACKUP/PCH23 REMOVED DISK/BACKUP/PCH24 REMOVED
RF USER/=/=;	USER/BACKUP/PRT12 REMOVED
RF USER/215/;	USER/DUMPFILE/215 REMOVED
USER SITE/A RF PRT/=;	D/(SITE)/PRT12 REMOVED D/(SITE)/PRT13 REMOVED

RL (Relabel)

The RL system command changes the disk identifier for a user disk.

The RL system command is not allowed on a user disk when it is assigned as a DL designation, when <family-name> is the same as a user disk currently on line on the system, or when the user count is greater than 0.

Remote ODT syntax:



Semantics:

<unit-mnemonic>
  This field must contain a valid user disk unit mnemonic. The allowable unit mnemonics are DPx and DCx, where x can be any upper-case alpha character of the user disk to be changed.

PACK <family-name>
  The PACK keyword specifies that a disk identifier follows instead of unit mnemonic.

<family-name>
  This field, which must contain a valid disk identifier, specifies the new name for the user disk. This new name cannot be the same as a user disk currently on line or assigned the name DISK.

Examples:

  RL DPB NEWUSER;

  RL DCE NEWCART

  RL PACK BACKUPS DLPACK

RM (Remove)

The RM system command removes a disk file from the disk directory in response to a DUPLICATE FILE ON DISK message.

The DUPLICATE FILE ON DISK message is a result of a program attempting to close a disk output file with the same name as a file already in the disk directory. This causes the program to go into a waiting state. The RM system command causes the MCP to remove the old file, close the new file, enter the new file in the disk directory, and allow the program to continue processing.

Remote ODT syntax:

```
── <mix-number> RM ──┬─────┬──────────────────────────────┤
                     └─ ; ─┘
```

Workstation syntax:

```
── <usercode><remote ODT syntax> ─────────────────────────┤
```

Semantics:

<mix-number>
This field must contain a mix number of a program waiting resolution of a duplicate file situation.

Example:

421 RM;

RN (Reader Number)

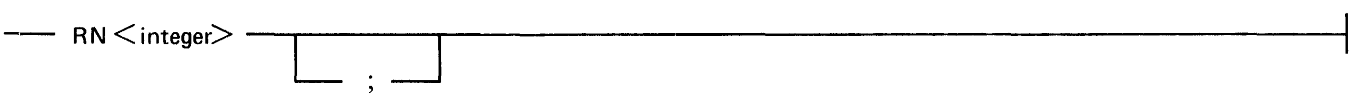
The RN system command assigns a specific number of pseudo readers and can be entered either before or after the creation of pseudo-reader files.

The operator must determine the optimum number of pseudo readers in relation to the number of pseudo-reader files to be processed.

By entering RN 0, all pseudo readers are closed as soon as they are finished processing the pseudo-reader files they are presently reading.

The pseudo-reader files are closed when a CLEAR/START operation is performed.

Remote ODT syntax:



Semantics:

<integer>
This field, which must contain an integer, specifies the number of active pseudo readers to be used.

Example:

Command	Response
RN 1;	NUMBER OF PSEUDO READERS CHANGED FROM 0 TO 1.

RO (Reset Option)

The RO system command resets system options.

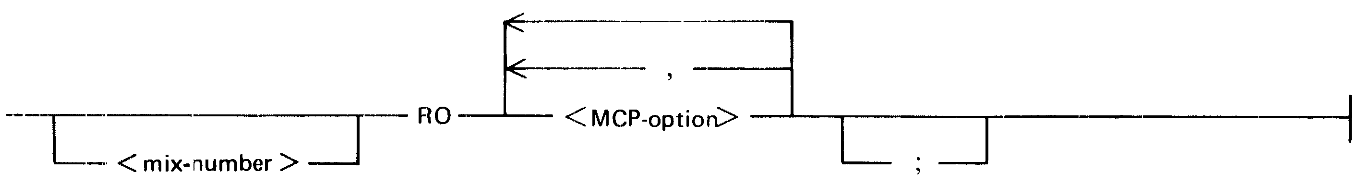
Certain system options cannot be reset using the RO system command. If an attempt is made to reset any of these options, the operating system displays the following message.

<MCP-option-name> LOCKED

The TO system command can be used to determine which options are currently set. The option indicator equals 1 when set and 0 when reset.

Refer to Section 3 for a complete description of the MCP options.

Remote ODT syntax:



Semantics:

<MCP-option>
This field, which must contain a valid MCP option name, specifies the option to be reset. Refer to Section 3 for a complete description of the valid MCP options.

<mix-number>
If a <mix-number> is present, the options are reset for the particular job only, overriding the system setting of those options. Only BREL, CLOS, COPY, LIB, OPEN, PBD, PBF, PBT, RMOV, SCHM, TERM, TRMD, and ZIP can be used with a <mix-number>.

Examples:

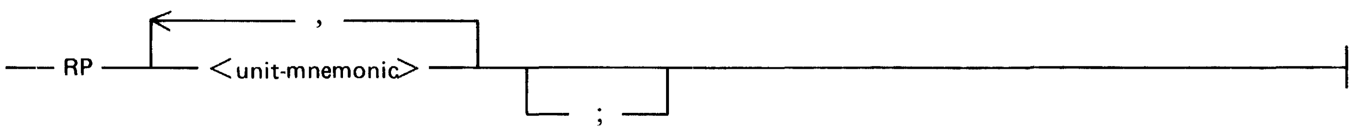
Command	Response
RO LIB;	LIB=0
RO DATE, TIME;	DATE=0 TIME ALREADY RESET
1511 RO BREL	*COBOL74 ON DISK : *PAYROLL ON UPDATE =1511 BREL OPTION NOW RESET

RP (Ready and Purge)

The RP system command sets a tape unit in READY status and purges the tape unit.

The RP system command is only valid for magnetic tape.

Remote ODT syntax:



Semantics:

<unit-mnemonic>
This field, which must contain a valid magnetic tape unit mnemonic, specifies the tape drive to make ready and the tape to purge.

Examples:

Command	Response
RP MTA	MTA SCRATCH [022386]
RP MTB, MTC;	MTB SCRATCH [013086] MTC SCRATCH [092886]

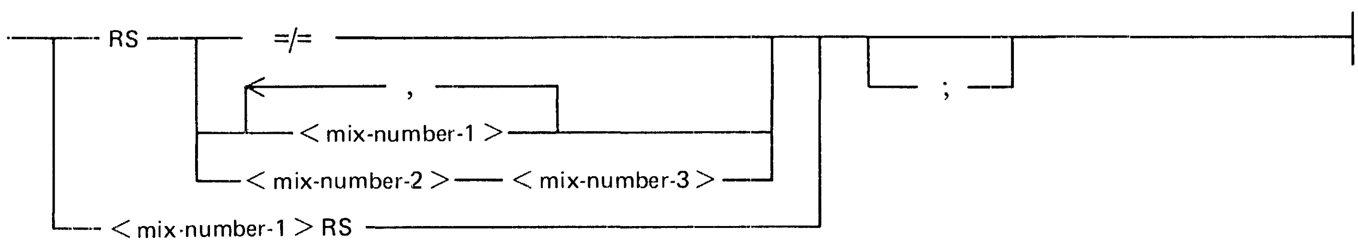
RS (Remove from Schedule)

The RS system command removes one or more tasks from the waiting or active schedules before it is entered in the mix for execution.

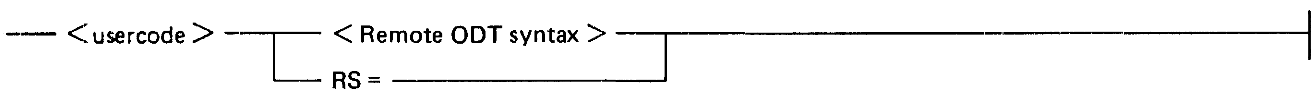
The RS system command can be used to remove a single task, a list of tasks, or a range of tasks from the waiting or active schedules.

If the requested task(s) are not in the waiting or active schedules, the MCP notifies the operator that an invalid request has been entered.

Remote ODT syntax:



Workstation syntax:



Semantics:

<mix-number-1>
: This field must contain the mix number of a program currently in the waiting or active schedules and specifies the program to be removed from the waiting or active schedules.

<mix-number-2>
: This field must contain the mix number of a program currently in the waiting or active schedules and is used to specifiy the lower limit of a range of mix numbers. <mix-number-2> must have a value less than <mix-number-3>.

<mix-number-3>
: This field must contain the mix number of a program currently in the waiting or active schedules and is used to specify the upper limit of a range of mix numbers. <mix-number-3> must have a value greater than <mix-number-2>.

=/=
: The =/= keysymbol causes all the programs in the waiting and active schedules to be removed.

=
: The = keysymbol in the workstation syntax causes all programs that are associated with <usercode> in the waiting and active schedules to be removed.

Example:

Command	Response
RS 33, 34, 35, 36;	JOB #33 RS-ED. JOB #34 RS-ED. JOB #35 RS-ED. JOB #36 NOT SCHEDULED- NOT RS-ED.
RS =/=;	JOB #24 RS-ED. JOB #24 RS-ED.
RS 1246 - 1248	SPECIFIED JOBS RS-ED.

RT (Remove Multipack Table)

The RT system command removes an entry from the multipack file table.

Remote ODT syntax:

```
— RT <file-identifier> ——┬——————┬——————————————————————————|
                         └— ; ——┘
```

Semantics:

<file-identifier>
This field, which must contain a valid multipack file identifier, specifies the name of the file entry to be removed from the multipack file table.

Examples:

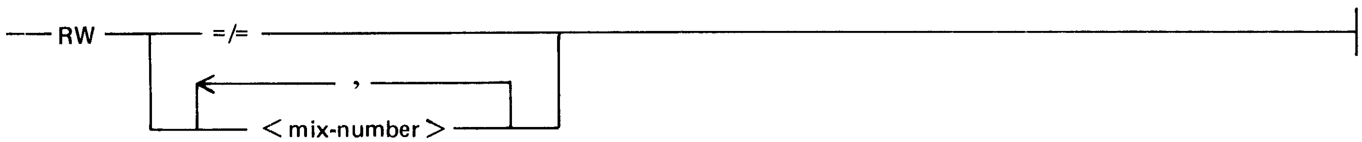
RT USER/A/B;

RT BASEPACK/MASTER/;

RW (Remove WFL)

The RW system command removes WFL job references from the restart table. The command also removes the restart file if it can be found.

Remote ODT syntax:



Semantics:

mix-number

This field specifies the mix number of a WFL job which is scheduled to be restarted but has not yet been restarted. If the job has been restarted it is not removed.

=/=

The =/= keysymbol specifies that all WFL jobs scheduled to be restarted are to be removed from the restart table.

Example:

Command	Response
RW =/=	JOB6706/WFLRESTART NOT REMOVED — NOT ON DISK 6206 REMOVED FROM RESTART TABLE JOB6888/WFLRESTART NOT REMOVED — NOT ON DISK 6888 REMOVED FROM RESTART TABLE 8748 REMOVED FROM RESTART TABLE WFL RESTART FILES REMOVED
RW 1608	1608 REMOVED FROM RESTART TABLE

RY (Ready)

The RY system command readies a peripheral unit and makes it available to the MCP.

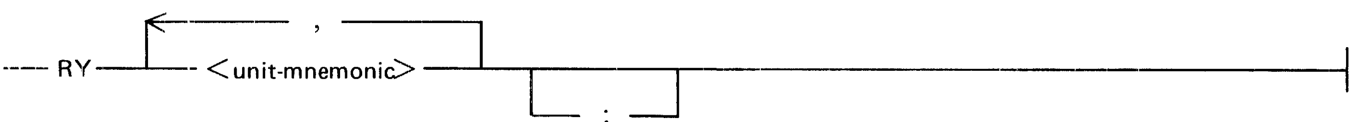
If the designated unit is not in use and is not offline, the RY system command causes all exception flags maintained by the MCP for the specified unit to be reset. After the unit has been made ready, the MCP attempts to read the file label (input devices only).

If the designated unit is a disk pack or cartridge, the RY system command may invoke the program in the PAN name slot from the name table to verify disk structures, absolutize the pack, remove temporary files, and correct end of file (EOF) pointers for protected files.

A RY system command referencing a card reader device causes the MCP to read the next card in the input hopper. If this card is a control card, the MCP performs the requested function.

When the COMPILE or EXECUTE program control instruction immediately precedes the DATA program control instruction without an intervening END program control instruction, the card reader is reserved explicitly for the compilation or execution. Without operator intervention (IL system command), such reserved card files can be opened only by the program for which they are reserved and, if unopened, remain reserved even after the program terminates or the operator enters the RS system command for the program. The RY system command has no effect on a card reader that is reserved in this manner. The CL system command permits the operator to remove the reserved condition from the card reader and allow it to be assigned to any program that opens it with the correct file identifier. To completely free the card reader by removing the file identifier, follow the CL system command with the RY system command.

Remote ODT syntax:



Semantics:

<unit-mnemonic>
This field, which must be a valid unit mnemonic, specifies the device to ready.

Examples:

Command	Response
RY DPB	DPB LABELED MASTER (U) #884071
RY MTC	
RY LPA, LPB;	

SB (Seconds Before Decay)

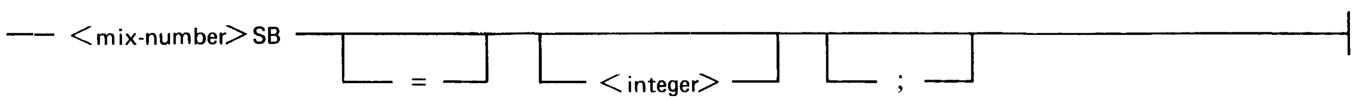
The SB system command sets or interrogates the seconds-before-decay attribute for code segments for the task specified.

The SB system command is valid only if the MPRI MCP option is set. The value specified is in units of seconds. The default value is 0 and the range is from 0 to 1024 inclusive.

If <integer> is omitted, the current setting of seconds-before-decay assigned to the program is displayed.

Refer to Appendix A for further information regarding Decay Intervals.

Remote ODT syntax:



Semantics:

<mix-number>
This field, which must contain a mix number, specifies the program in which to interrogate or change the value of the seconds-before-decay attribute.

<integer>
This field, which must contain an integer in the range 0 to 1024 inclusive, specifies the number of seconds for a code segment to remain in memory before it is decayed to the next memory priority.

Examples:

Command	Response
1243SB = 31;	*NDL/HANDLER ON DISK =1243 SECONDS BEFORE DECAY CHANGED TO 31
1244SB =	*CANDE ON DISK =1244 SECONDS BEFORE DECAY = 10

SD (System Drive)

The SD system command assigns additional SYSTEM drives to the MCP.

The SD system command causes the specified disk to be purged after verifying that <serial-number> is correct and adds the purged disk to the SYSTEM disks already on the system.

At coldstart time, there is only one SYSTEM disk; additional disk drives can be added by the SD system command. Once a SYSTEM drive has been added to the system, it cannot be removed without performing a coldstart operation.

The following message is displayed when the new SYSTEM disk is linked to the system.

<unit-mnemonic> IS NOW A SYSTEM DRIVE — AND READY FOR USE

Remote ODT syntax:

```
── SD ─┬─ <unit-mnemonic> ──────┬── <serial-number> ─┬─────┬──────────────┤
       └─ PACK <family-name> ───┘                     └─ ; ─┘
```

Semantics:

<serial-number>
This field must contain a 6-digit number and is the serial number of the user disk to be made into a SYSTEM disk.

<unit-mnemonic>
This field, which must contain a valid user-disk specifies the disk drive that is to be made into a SYSTEM disk drive.

PACK <family-name>
The PACK keyword specifies that a disk identifier follows instead of a unit mnemonic.

Example:

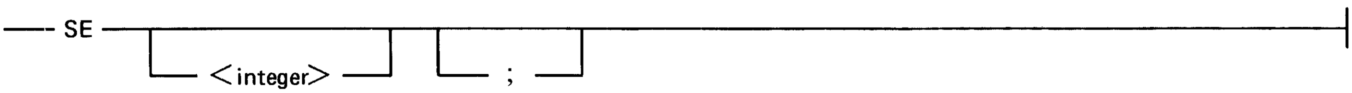
SD DPB 102182

SE (Switch Enable)

The SE system command enables the sensing of the 24 Data Entry Switches on the B 1000 console (while in RUN mode) by specific classes of programs and firmware.

Only SDL and MIL programs contain the source language constructs required to sense the Data Entry Switches. In both languages, the CONSOLE_SWITCHES construct is used, and provides the 24-bit image for the Data Entry Switches.

Remote ODT syntax:



Semantics:

<integer>

This field must contain an integer in the range 0 to 15 inclusive.

The value of <integer> specifies the programs that are allowed to sense the Data Entry Switches according to the following table.

Value of <integer>	**Program**
0	Disable Switches
2	Normal-state Programs
4	Interpreters
8	GISMO

<integer> can also be any sum of the above values, in which case multiple classes of programs are allowed to sense the Data Entry Switches.

Examples:

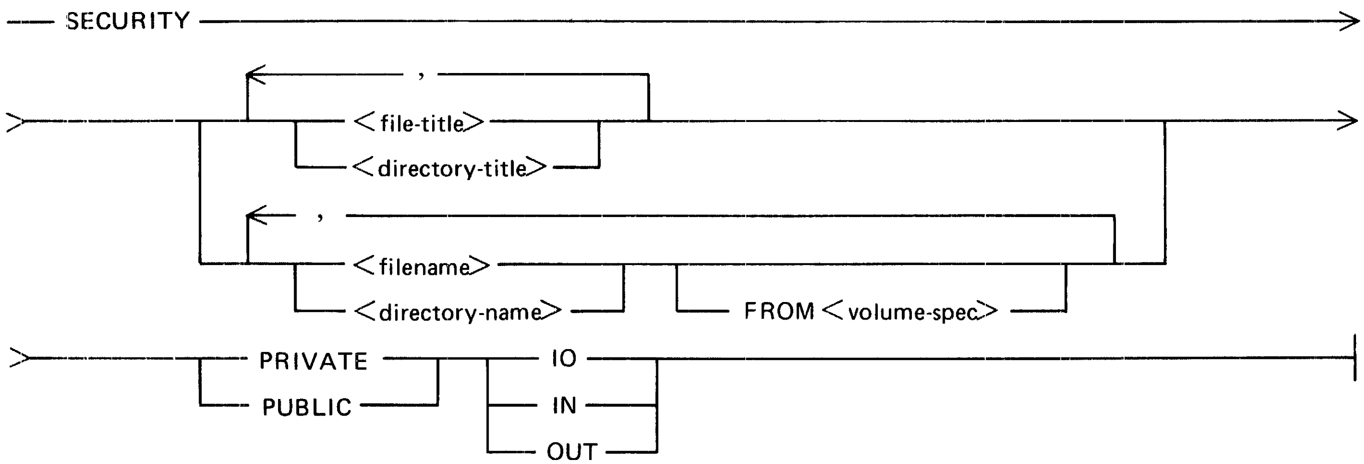
SE 2;

SE 10;

SECURITY

The SECURITY system command changes the security attributes of files on disk.

Remote ODT syntax:



Workstation syntax:

Semantics:

IO
: The IO keysymbol allows the file to be opened for input and output.

IN
: The IN keyword restricts the file to be opened for input only.

OUT
: The OUT keyword restricts the file to be opened for output only.

PRIVATE
: The PRIVATE keyword restricts access to the file to 1) usercodes that are privileged (*PRIV) usercodes or 2) usercodes that have the same name as the first part of the file title.

PUBLIC
: The PUBLIC keyword allows access to the file by any user.

Example 1:

SECY AB/XY PRIVATE IO;

Changes the security of file AB/XY on DISK to private for input and output.

Example 2:

SECURITY Z ON PACK PUBLIC IN;

Changes the security of file Z on the disk PACK to public for input only.

SL (Set Log)

The SL system command sets the LOG or ODTL MCP options, and allocates the disk area required.

The MCP responds with one of the following messages when an SL system command is entered.

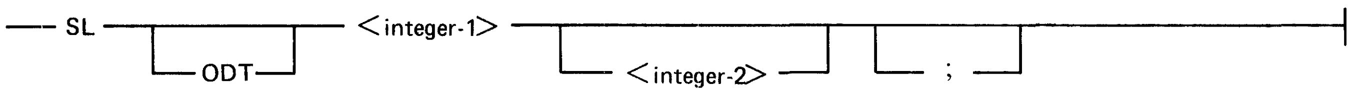
LOG OPTION NOW PENDING- NO MORE TASKS WILL BE EXECUTED UNTIL A CLEAR/START HAS BEEN PERFORMED.
ODTL STARTED

If there is not sufficient disk space for the first area of the log file, the following message is displayed.

DISK SPACE IS NOT AVAILABLE FOR NEW LOG [ODTLOG]

If the value of <integer-1> is zero, the LOG or ODTL system option is reset and the log file is transferred (as though a TL system command had been entered). A new SYSTEM/LOG or SYSTEM/ODTLOG file is not created.

Remote ODT syntax:



Semantics:

<integer-1>
This field, which must contain an integer in the range 100 to 10000 inclusive, specifies the size of each disk area to be assigned to the LOG or ODTLOG file.

<integer-2>
This field, which must contain an integer in the range 2 to 105 inclusive, specifies the maximum number of disk areas desired.

Examples:

SL 1000

SL 250 5

SL 0 - RESETS LOG OPTION

SL ODT 100 105

SL ODT 500 50

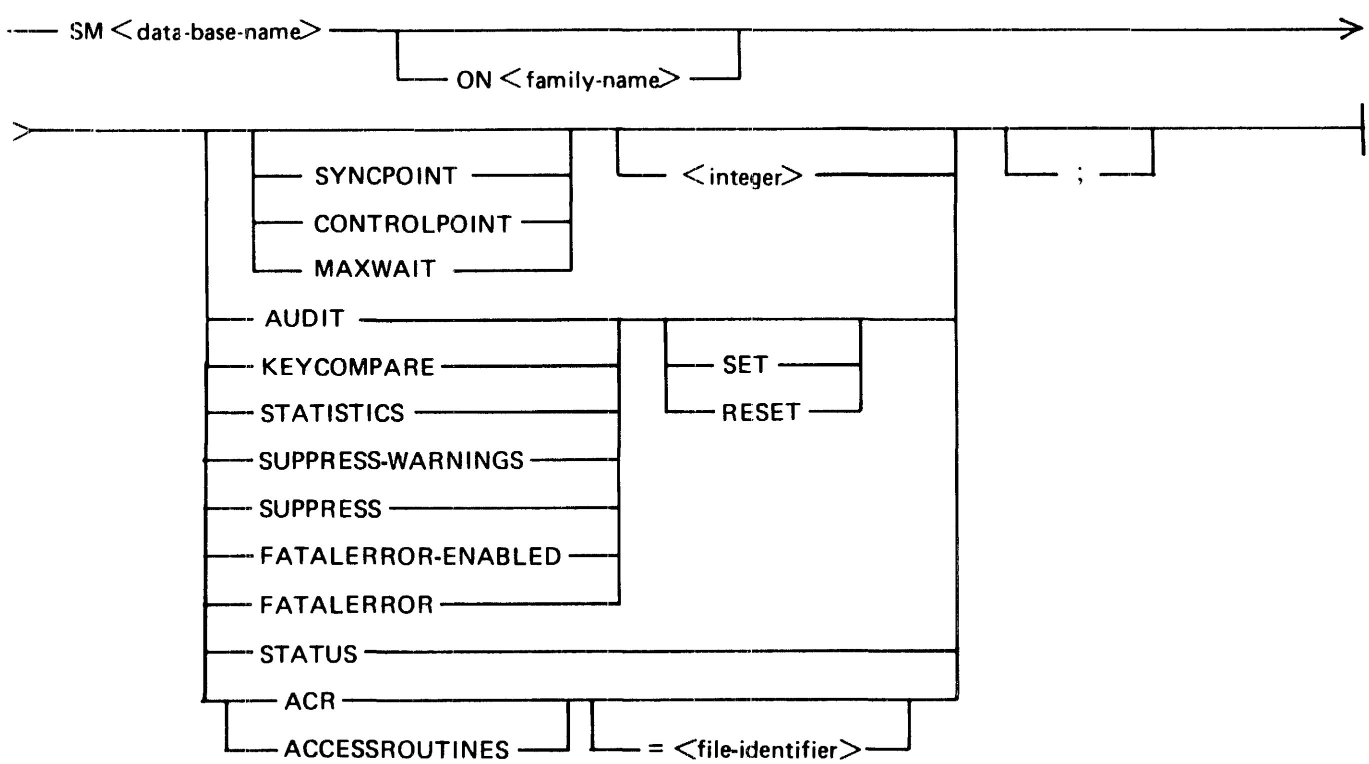
SM (Set Data Base Parameters)

The SM system command is used in conjunction with the B 1000 DMSII system and interrogates or dynamically sets certains paramaters of a DMSII data base. The parameters can also be specified in the DASDL source. Refer to the DASDL manual for more information.

If an integer is omitted when specifying the SYNCPOINT, CONTROLPOINT, or MAXWAIT parameters, or if SET or RESET is omitted when specifying the AUDIT or KEYCOMPARE parameters, or if a file-identifier is omitted when specifying the accessroutines paramter, the current setting of the parameter is displayed by the MCP. The data base need not be inactive in order to interrogate the parameters.

If the data base is active, the MCP does not allow any of the parameters specified by the SM system command to be changed. If the data base does not have the AUDIT option specified in the DMS/DASDL compiler source file, the AUDIT, CONTROLPOINT, and SYNCPOINT parameters cannot be changed by the SM system command.

Remote ODT syntax:



Semantics:

<integer>
This field, which must contain an integer, specifies the value to use for the CONTROLPOINT, SYNCPOINT, and MAXWAIT keywords.

ACCESSROUTINES or ACR
The ACCESSROUTINES keyword causes the name of the DMSII access routine used by the data base to be displayed. If ACCESSROUTINES is followed by a <file-identifier> equation, the name of the access routine is changed. The default name for the access routine file is DMS/ACR, but may be changed for test purposes.

AUDIT
The AUDIT keyword changes or interrogates the AUDIT parameter in the specified data base. If the SET or RESET keywords follow the AUDIT keyword, the AUDIT parameter is set or reset, respectively. The AUDIT option must be specified in the DASDL source file in order for the AUDIT keyword in the SM system command to be valid. If AUDIT is reset on a data base then any program using begin or end transaction commands will be DSed. If the AUDIT option is changed from SET to RESET and then to SET again, data base recovery thru the period of time that the AUDIT option was reset will fail with an audit serial number mismatch.

CONTROLPOINT
The CONTROLPOINT keyword assigns or interrogates the CONTROL POINT parameter in the specified data base. If <integer> follows the CONTROLPOINT keyword in the SM system command, the CONTROL POINT parameter is assigned the value of <integer> syncpoints per controlpoint.

FATALERROR-ENABLED or FATALERROR
The FATALERROR-ENABLED or FATALERROR keywords query, set, or reset the DM_FATALERROR_ENABLED flag in the DMS globals. This flag controls whether a job that is discontinued, (DS or DP system command), generates a FATALERROR exception if it cannot obtain a system lock to complete its operation. If this flag is reset (by default) then the job is not discontinued. If the flag is set, then a discontinuing of the job causes a FATALERROR exception, closing the data base for all programs.

KEYCOMPARE
The KEYCOMPARE keyword sets, resets, or interrogates the KEY COMPARE parameter in the specified data base. If the SET or RESET keyword follows the KEYCOMPARE keyword in the SM system command, the KEY COMPARE parameter is set or reset, respectively.

MAXWAIT
The MAXWAIT keyword assigns or interrogates the MAXWAIT parameter in the specified data base. If <integer> follows the MAXWAIT keyword in the SM system command, the MAXWAIT parameter is assigned the value of <integer>.

ON
The ON keyword is required if <family-name> is to follow in the syntax of the SM system command and specifies that the data base dictionary resides on a user disk.

RESET
The RESET keyword is valid for the AUDIT, KEYCOMPARE and STATISTICS keywords, and resets the AUDIT or KEY COMPARE parameters in the specified data base.

SET
The SET keyword is valid for the AUDIT and KEYCOMPARE keywords and sets the AUDIT or KEY COMPARE parameters in the specified data base.

STATISTICS

The STATISTICS keyword sets, resets, or interrogates the STATISTICS option in the specified database. If the SET or RESET keyword follows the STATISTICS keyword in the SM system command, the STATISTICS option is set or reset, respectively. If the STATISTICS option is set, then the following database-related events will be noted in the ODT log. The messages appearing are the same as the ones displayed if the system-wide OPEN and CLOS options are set.

An Open message is displayed whenever any job opens the database.

A Close message is displayed whenever any job closes the database. This close message includes the DMS processor time, number of transactions, update operations, non-update operations, and exceptions accumulated by this job.

An Open message is displayed whenever an audit file is opened.

A Close message is displayed whenever an audit file is closed.

There is no overhead associated with the STATISTICS option. It only causes the display of statistics which are accumulated regardless of the option setting.

STATUS

The STATUS keyword allows rapid interrogation of the abnormal data base conditions. If the condition is not abnormal, then the status NORMAL is reported. If the condition is abnormal, then the status reported is one or more of the following:

RECOVERY REQUIRED indicates that the data base was not closed normally at the end of its last update run because a CLEAR/START or fatal error occurred.

WRITE ERROR indicates that an irrecoverable I/O error occurred on the dictionary.

RECOVERY IN PROGRESS indicates that DMS/RECOVERDB has been initiated, but has not completed executing. DMS/RECOVERDB may be currently running or may have been DS'ed.

REORGANIZATION indicates that DMS/REORGANIZATION has been initiated, but has not completed executing. DMS/REORGANIZATION may be running currently or may have been DS'ed.

STRUCTURE WRITE ERROR indicates that one or more of the structures had a write error. DMS/DBMAP should be executed to identify the structure.

SUPPRESS-WARNINGS or SUPPRESS

The SUPPRESS-WARNINGS or keywords query, set or reset the DM_SUPPRESS_WARNINGS flag in the DMS globals. This flag controls the display of the message: DMS ACCESSROUTINES HAVE BEEN HUNG FOR 30 SECONDS WAITING FOR A SYSTEM LOCK.

SYNCPOINT

The SYNCPOINT keyword changes or interrogates the SYNCPOINT parameter in the specified data base. If <integer> follows the SYNCPOINT keyword, the SYNCPOINT parameter is assigned the value of <integer> transactions per syncpoint.

<data-base-name>

This field, which must contain a valid data base identifier, specifies the data base for which to interrogate or change the specified parameters.

<family-name>

This field, which must contain a valid disk identifier, specifies the user disk on which the data base dictionary resides.

Examples:

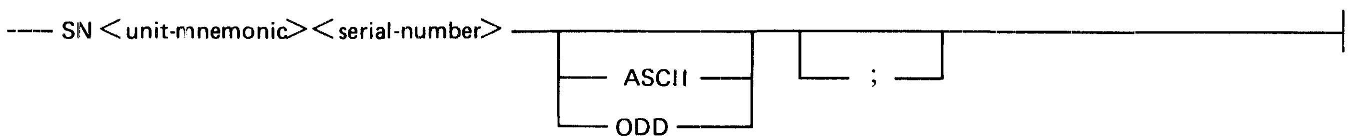
Command	Response
SM STUDENTDB CONTROLPOINT 25;	CONTROLPOINT CHANGED FROM 10 TO 25
SM PAYROLL ON USER1 SYNCPOINT;	SYNCPOINT = 5
SM FTRDB AUDIT;	AUDIT IS SET
SM INVENTORY ACCESSROUTINES;	ACCESSROUTINES = DMS/ACR FOR DATA-BASE INVENTORY

SN (Serial Number)

The SN system command initializes and purges a magnetic tape, assigning a volume serial number to the tape label. An ANSI label is written to the magnetic tape. Any tape that does not contain a valid ANSI label cannot be purged with the PG system command. This includes both unlabeled tapes and those that have the Burroughs standard label.

ANSI tape labels can be maintained in either EBCDIC or 8-bit ASCII recording mode. The label recording mode is determined by the SN system command, and remains unaltered (even if the PG system command is used) until explicitly changed by another SNL or SN system command. The recording mode of the tape label is completely independent of the mode in which the data is recorded on the tape.

Remote ODT syntax:



Semantics:

<unit-mnemonic>
: This field, which must contain a valid magnetic tape unit mnemonic, specifies the tape drive on which to perform the SN.

<serial-number>
: This field, which must contain a 6-character alphanumeric string, specifies the serial number of the tape label, and remains in all labels on the tape even if the PG system command is used. <serial-number> can be explicitly changed by another SN or SNL system command.

ASCII
: The ASCII keyword causes the recording mode to be EVEN and is only valid for 7-track tape drives.

ODD
: The ODD keyword causes the recording mode to be ODD and is only valid for 7-track tape drives.

Examples:

SN MTA 123456

SN MTC BACKUP ASCII

SN MTD 012681 ODD

SNL (Serial Number and Lock)

The SNL system command initializes and purges a magnetic tape, assigning a volume serial number to the tape label. An ANSI label is written to the magnetic tape. Any tape that does not contain a valid ANSI label cannot be purged with the PG system command. This includes both unlabeled tapes and those that have the Burroughs standard label. The tape is locked following initialization if the SNL system command is used, and is readied following initialization if the RY system command is used.

ANSI tape labels can be maintained in either EBCDIC or 8-bit ASCII recording mode. The label recording mode is determined by the SNL system command, and remains unaltered (even if the PG system command is used) until explicitly changed by another SNL or SN system command. The recording mode of the tape label is completely independent of the mode in which the data is recorded on the tape.

Remote ODT syntax:

```
—— SNL <unit-mnemonic> <serial-number> ─┬───────────┬─┬─────┬──────────────────┤
                                        ├─ ASCII ───┤ └─ ; ─┘
                                        └─ ODD ─────┘
```

Semantics:

<unit-mnemonic>
: This field, which must contain a valid magnetic tape unit mnemonic, specifies the tape drive on which to perform the SNL.

<serial-number>
: This field, which must contain a 6-character alphanumeric string, specifies the serial number of the tape label, and remains in all labels on the tape even if the PG system command is used. <serial-number> can be explicitly changed by another SN or SNL system command.

ASCII
: The ASCII keyword causes the recording mode to be EVEN and is only valid for 7-track tape drives.

ODD
: The ODD keyword causes the recording mode to be ODD and is only valid for 7-track tape drives.

Examples:

SNL MTA 123456

SNL MTC BACKUP ASCII

SNL MTD 012681 ODD

SO (Set Option)

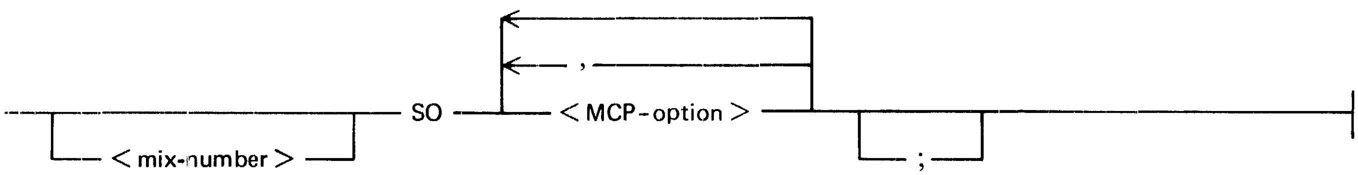
The SO system command sets MCP options. Refer to section 3 for a complete list of the MCP options that can be specified with the SO system command.

The MCP replies with verification that the option has been set after each SO system command.

The LOG and ODTL cannot be set with the SO system command. If an attempt is made to set these options, the MCP displays a message indicating that the LOG or ODTL options are locked.

The TO system command can be used to determine which options are currently set. The option indicator equals 1 when set and 0 when reset.

Remote ODT syntax:



Semantics:

<MCP-option>
This field can contain any valid MCP option and specifies the option to be set.

<mix-number>
If a <mix-number> is present, the options are reset for the particular job only, overriding the system setting of those options. Only BREL, CLOS, COPY, LIB, OPEN, PBD, PBF, PBT, RMOV, SCHM, TERM, TRMD, and ZIP can be used with a <mix-number>.

Examples:

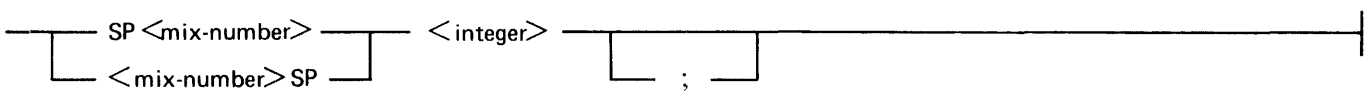
Command	Response
SO COPY	COPY ALREADY SET
SO LIB, RMOV	LIB = 1 RMOV = 1
SO LOG	LOG LOCKED
146SO COPY	*SYSTEM/COPY ON DISK =146 COPY OPTION NOW SET

SP (Schedule Priority)

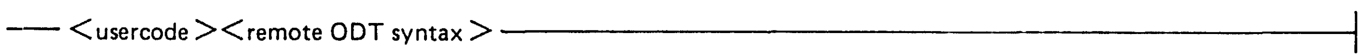
The SP system command changes the schedule priority of a program currently in the active or waiting schedule.

The schedule priority is separate from the priority of the program when it is in the mix and specifies the order in which programs are allowed to enter the mix. A program with a given schedule priority enters the mix prior to any program in the active schedule with a lower priority.

Remote ODT syntax:



Workstation syntax:



Semantics:

<integer>
: This field, which must contain an integer in the range 0 to 14 inclusive, specifies the value for the schedule priority.

<mix-number>
: This field must contain a mix number of a program in the active or waiting schedule and specifies the program to which the new schedule priority is to be assigned.

Examples:

Command	Response
1974 SP 14	#1974 SCHEDULE PRIORITY CHANGED TO 14.
SP 1700 10	#1700 SCHEDULE PRIORITY CHANGED TO 10.

SQ (Squash)

The SQ system command initiates the SYSTEM/SQUASH program to perform a disk squash.

If the files on a disk pack are volatile, then squashing the disk should be performed regularly. This prevents the buildup of a large number of small disk areas, also known as checkerboarding, that can reduce the amount of disk space available to the system, and increase the time needed to obtain disk.

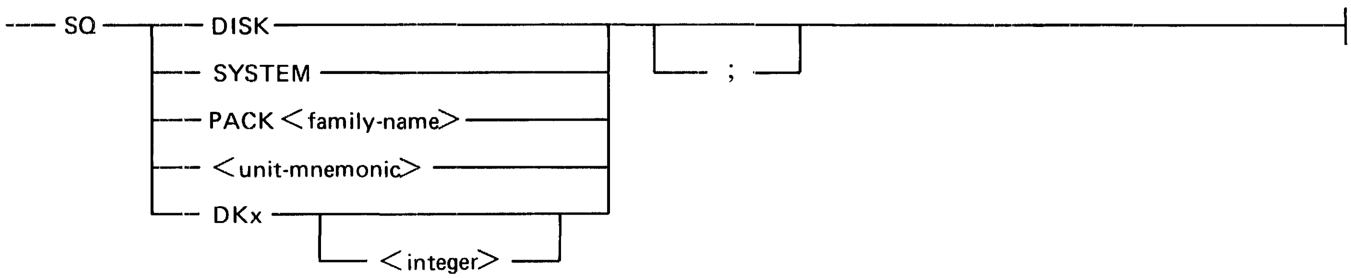
When squashing a disk, the MCP moves areas of data to a numerically-lower disk address in order to alleviate checkerboarding.

Either the system disk or a user disk can be squashed. Each SQ system command affects only one disk of a multiple system disk configuration or one EU of a head-per-track device. The DISK or SYSTEM keywords can be used to specify a system disk squash.

Before invoking the SYSTEM/SQUASH program on a system disk, the MCP stops all tasks except the SYSTEM/ODT program, and for systems without an ODT, the network controller. The tasks are restarted when the SYSTEM/SQUASH program terminates. During a squash of the system disk, input to the ODT is restricted to commands for the SYSTEM/SQUASH program; all other input is rejected with an appropriate message.

Refer to the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the SYSTEM/SQUASH program.

Remote ODT syntax:



Semantics:

DISK
: The DISK keyword indicates that the SYSTEM disk is to be squashed.

SYSTEM
: The SYSTEM keyword indicates that the SYSTEM disk is to be squashed.

PACK
: The PACK keyword indicates that a user disk is to be squashed.

<family-name>
: This field, which must contain a disk identifier, specifies the name of the disk to be squashed.

<unit-mnemonic>
: This field can contain any of the disk unit mnemonics. The disk unit mnemonics are DCx and DPx.

DK<x>
: The DK<x> keysymbol specifies a head-per-track SYSTEM disk on which the squash operation is to be performed, where the lower-case letter x is the disk drive of the SYSTEM disk.

<integer>
: This field, which must contain an integer, specifies the electronics unit (EU) of a head-per-track SYSTEM disk.

Examples:

```
SQ SYSTEM
SQ DPA
SQ PACK TESTPACK
```

ST (Stop)

The ST system command temporarily suspends the processing of a program in the mix.

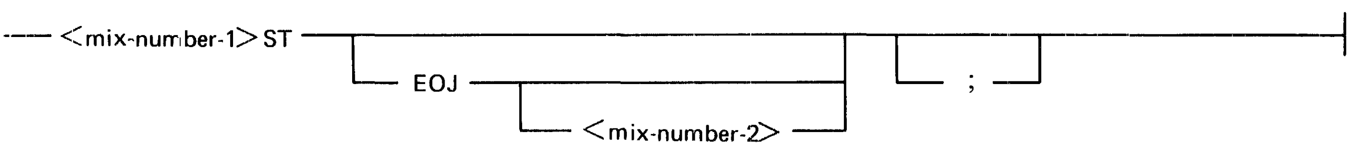
The MCP does not suspend the program until all input/output (I/O) operations in progress are complete.

A suspended program retains the mix number and peripherals assigned to it; the MCP uses this information to identify the program when referenced by another system command.

To restart a program after it has been suspended, enter the OK or GO system command. If for any reason the conditions necessary for the program to run are not met when the OK or GO system command is entered, the MCP does not restart the program.

By using the EOJ keysymbol, a program that is suspended can also be restarted as a result of the termination of another program.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number-1>
: This field, which must contain a mix number, specifies the program to be temporarily suspended.

EOJ
: The EOJ keyword causes the specified program to be temporarily suspended until another program in the mix reaches end of job (EOJ). The EOJ option in the ST system command is useful when thrashing has been detected in order to make memory space available for other running programs. Refer to appendix A for a complete description of thrashing detection.

<mix-number-2>
: This field, which must contain a mix number of a currently executing program, specifies the task that must terminate in order for the suspended task to be restarted.

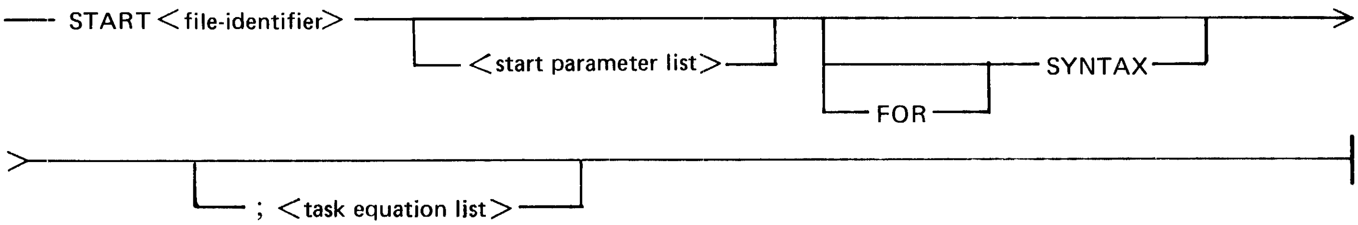
Examples:

Command	Response
823 ST	*DMPALL ON DISK =823 STOPPED. TIME = 14:23:22.1
947 ST EOJ	*CANDE ON DISK =947 STOPPED UNTIL AN EOJ. TIME = 07:03:45.6
1234 ST EOJ 1201	*DMPALL ON DISK =1234 STOPPED UNTIL EOJ OF JOB #1201. TIME = 15:11:01.0

START (Start a WFL Job)

The START system command requests that the WFL job be initiated. The START command requires that the command end with the end of text, that is, another command cannot follow the START command. Refer to the *B 1000 Systems Work Flow Language (WFL) Language Manual* for a complete description of the WFL system.

Syntax:



<file-title>
: This field must refer to a file containing the source of a WFL <job> to be initiated.

<start-parameter-list>
: This field is a boolean, integer, or string expression that is substituted for the parameter identifiers in the <job parameter list> of the STARTed job.

SYNTAX
: The SYNTAX keyword indicates that the started job is compiled for syntax only and execution does not occur.

<task-equation-list>
: This field specifies task attributes for the initiated job.

SV (Save)

The SV system command makes a peripheral device unaccessible to all tasks until a CLEAR/START operation occurs, or until a RY or CL system command is used to ready the device.

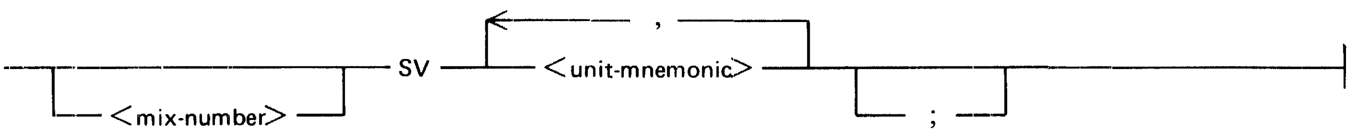
If the device is in use, the MCP displays the following message.

<unit-mnemonic> TO BE SAVED

The device is made available when the task that the device was saved for closes the file that was using the device.

Disk devices (including DISKETTE) cannot be specified with the SV system command.

Remote ODT syntax:



Semantics:

<mix-number>
: This field must contain a mix number and causes the device to be saved for the program specified. No other programs can access the device until the program specified relinquishes the device.

<unit-mnemonic>
: This field, which must contain a non-disk unit mnemonic, specifies the device to be saved.

Examples:

Command	Response
SV MTA	MTA SAVED
1456 SV LPA	LPA SAVED FOR JOB # 1456
SV MTB, LPA	MTA SAVED LPA SAVED

SW (Set Switch)

The SW system command sets programmatic switches for the specified program.

Programmatic switches can also be set using the SWITCH program control instruction. Refer to Section 4 for a complete description of the SWITCH program control instruction.

Remote ODT syntax:

```
--- <mix-number>SW --+-- @<10-digit-hexadecimal-number>@ ---------------------+--->
                     |                                                         |
                     +-- <switch-number> --+-------+--+-- <integer> -----------+
                                           |       |  |                        |
                                           +-- = --+  +-- @<hex-number>@ ------+

>-----------+-------+---------------------------------------------------------|
            |       |
            +-- ; --+
```

Workstation syntax:

```
--- <usercode> <remote ODT syntax> -------------------------------------------|
```

Semantics:

<mix-number>
: This field, which must contain a mix number of an executing program, specifies the program for which to set the programmatic switch(es).

<10-digit-hexadecimal-number>
: This field, which must contain a hexadecimal number in the range 0000000000 to FFFFFFFFFF inclusive, specifies the values of program switches 0 through 9, respectively.

<switch-number>
: This field, which must contain an integer in the range 0 to 9 inclusive, specifies the program switch to set.

<integer>
: This field, which must contain a 1-digit integer in the range 0 to 9 inclusive, specifies the value for <switch-number>.

<hexadecimal-number>
: This field, which must contain a hexadecimal number in the range 0 to F inclusive, specifies the value for <switch-number>.

Examples:

```
25SW 1 = @F@

2SW8 6

1473SW = @0123456789@
```

SY (System Program Pack)

The SY system command interrogates or changes the disk device on which the MCP expects to find certain utility programs. This disk device is called the system program pack. The utility programs are those that are normally executed by a system command instead of the EXECUTE program control instruction (for example, the SYSTEM/BACKUP program is normally executed with the PB system command). The SY system command allows these utility programs to be moved from the system disk while allowing the operator to use the convenient system commands for their execution. It is intended for sites having extremely limited system disk capacity.

If no parameter is included with the SY system command, the current system program pack is displayed.

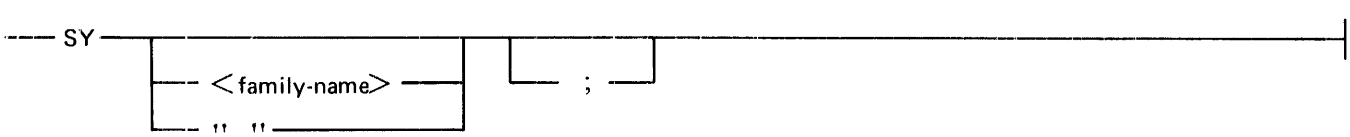
The system program pack defaults to the system disk at the time of a coldstart operation. If the system program pack is changed to a user pack, the system disk can later be indicated by specifying a null quoted string (" ") as a parameter.

Table 5-1 lists the utility programs that can be executed through a system command and indicates the pack on which the MCP expects to find the program. The utility programs that are expected to be located on the system disk only cannot be affected by the SY system command. The remaining utility programs are expected to be located on the system program pack.

Table 5-1. Utility Programs and their Associated System Command

Utility Program	System Command	Expected Location
BNA/NSM	NW	system disk
DISKETTE/COPY	OL FDx	system program pack
DMS/RECOVERDB	RC	system disk
SYSTEM/BACKUP	PB	system disk
SYSTEM/COPY	various	system disk
SYSTEM/ELOGOUT	ET	system program pack
SYSTEM/IDA	PM	system program pack
SYSTEM/LDCONTRL	LD	system program pack
SYSTEM/LOGOUT	LG/LN	system program pack
SYSTEM/ODTLOGOUT	LG ODT	system program pack
SYSTEM/PANDA	various	system disk
SYSTEM/SQUASH	SQ	system disk
SYSTEM/WFL	various WFL	system disk

System ODT syntax:



Semantics:

<family-name>
This field can contain any disk identifier and specifies the name of the disk that is to be the system program pack.

" "
The " " keysymbol indicates that the system disk is to be the system program pack.

Examples:

Command	Response
SY	SYSTEM PROGRAM PACK= SYSTEM DISK
SY USERPACK	SYSTEM PROGRAM PACK= "USERPACK".
SY " "	SYSTEM PROGRAM PACK= SYSTEM DISK

TD (Time and Date)

The TD system command causes the MCP to display the current system time and date. The following is the format of the response generated by the MCP.

TIME = <hours>:<minutes>:<seconds>.<tenths-of-second>
DATE = <month>/<day>/<year> <name-of-day>
(JULIAN DATE = <year><julian-day>)

The time displayed is based on a 24-hour clock. For example, 08:10:25.3 AM is displayed as 08:10:25.3, and 08:10:25.3 PM is displayed as 20:10:25.3.

Syntax:

```
---- TD -+-------+---------------------------------------------|
         |       |
         +-- ; --+
```

Example:

Command	Response
TD	TIME = 15:30:54.3 DATE = 01/26/87 MONDAY (JULIAN DATE = 87026)

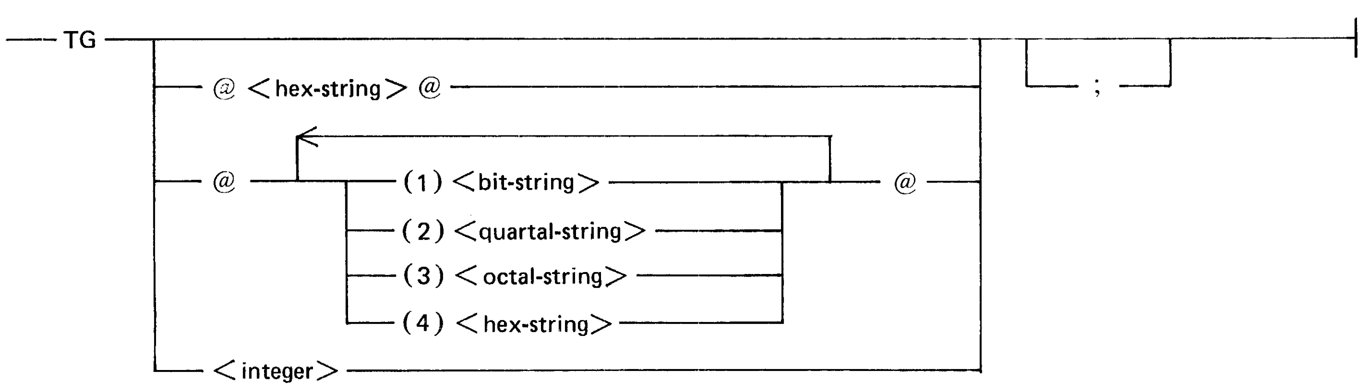
TG (Trace Gismo)

The TG system command interrogates or changes the group of flags that instruct the GISMO program to trace various system events. If no parameter is specified, the TG system command interrogates and displays the current settings of the trace flags. If a parameter is specified, the TG system command sets the flags according to the value of the parameter. The memory required for the GISMO trace code and trace table space is allocated at CLEAR/START time if the TG flags are non-zero at that time. Once the memory is allocated, a CLEAR/START operation is not required to invoke any change. The DBUG system option must be set for any tracing.

The parameter maps onto a 24-bit field used by the GISMO program to determine which functions to place in the trace table. If a bit is set, the corresponding function is traced; otherwise, the function is not traced. The 24-bit field is mapped as follows.

Bits	Function
0	Trace channel 0 activity.
1	Trace channel 1 activity.
.	.
.	.
.	.
14	Trace channel 14 activity.
15	Trace all GISMO functions except interrupt handling, scheduler functions, and the timer.
16	Trace port activity (multiline control and master/slave communication on dual-processor systems).
17	Not used.
18	Trace MMCP activity.
19	Trace SMCP CONDITIONAL.HALTS.
20	Trace interrupt handling, scheduler functions, and the timer.
21	Time stamp all trace entries
22	Trace data transfers for those channels specified by bits 0 through 14.
23	Reserved for GISMO use.

Remote ODT syntax:



Semantics:

<hex-string>
This field can contain any hexadecimal number and maps onto the 24-bit trace field.

<bit-string>
This field can contain any bit string of zeros (0) and ones (1) and maps onto the 24-bit trace field.

<quartal-string>
This field can contain any quartal string and maps onto the 24-bit trace field.

<octal-string>
This field can contain any octal string and maps onto the 24-bit trace field.

(1), (2), (3), (4)
The (1), (2), (3), and (4) keysymbols specify that a bit, quartal, octal, or hexadecimal string immediately follows.

<integer>
This field can contain any integer in the range 0 to 16,777,215 inclusive and maps onto the 24-bit trace field.

Examples:

Command	**Response**
TG	GISMO TRACE FLAGS = @000204@ CHANNEL MASK @0002@ TIMESTAMP
TG @001204@	GISMO TRACE CHANGED FROM @000204@ TO @001204@ CHANNEL MASK @0012@ TIMESTAMP

The second example sets bits 11, 14, AND 21 of the trace field. This causes tracing of I/O activity for channels 11 and 14 with a time stamp for each trace entry.

TI (Time Interrogation)

The TI system command interrogates the amount of processor time the specified program has accumulated at the time the interrogation is made.

The following is the format of the response displayed by the MCP.

USER INTERP=hh:mm:ss.t; MMCP=hh:mm:ss.t; SMCP=hh:mm:ss.t
[DMS INTERP=hh:mm:ss.t; MMCP=hh:mm:ss.t; SMCP=hh:mm:ss.t]
[IBASIC INTERP=hh:mm:ss.t; MMCP=hh:mm:ss.t; SMCP=hh:mm:ss.t]
TOTAL INTERP=hh:mm:ss.t; MMCP=hh:mm:ss.t; SMCP=hh:mm:ss.t
TOTAL PROCESSOR=hh:mm:ss.t; ELAPSED=hh:mm:ss.t

Syntax:

Semantics:

<mix-number>
This field, which must contain a mix number, specifies the program for which to interrogate the accumulated processor time.

Example:

Command	**Response**
84 TI;	*DMS/INQUIRY ON DISK =84 USER INTERP=3:15.0; MMCP=23.1; SMCP=12.4
	*DMS/INQUIRY ON DISK =84 DMS INTERP=1:04.4; MMCP=0; SMCP=18.9
	*DMS/INQUIRY ON DISK =84 TOTAL INTERP=4:19.4; MMCP=23.1; SMCP=31.3
	*DMS/INQUIRY ON DISK =84 TOTAL PROCESSOR=5:13.8; ELASPED=23:54.6

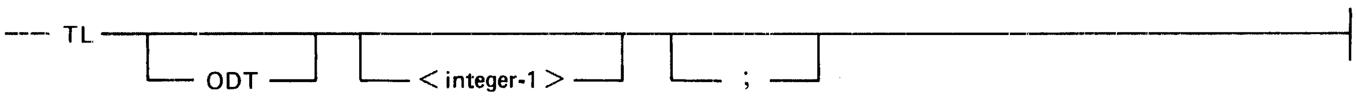
TL (Transfer Log)

The TL system command transfers the information in the SYSTEM/LOG or SYSTEM/ODTLOG files to LOG/#<integer> or ODTLOG/<date-and-time>, respectively, where <date-and-time> has the form <MMDDYYHHMM>. To transfer and print the log files, refer to the LG system command.

If the ODT keyword is omitted in the TL system command, the SYSTEM/LOG file is transferred. If the ODT keyword is included, the SYSTEM/ODTLOG file is transferred.

The TL system command creates a new (empty) log file.

Remote ODT syntax:



Semantics:

ODT
    The ODT keyword causes the SYSTEM/ODTLOG file to be transferred. If the ODT keyword is omitted, the SYSTEM/LOG file is transferred.

<integer-1>
    This field, which must contain an integer in the range 100 to 10000 inclusive, specifies the size of each disk area to be assigned to the LOG file. It is ignored for an ODT log transfer.

Example:

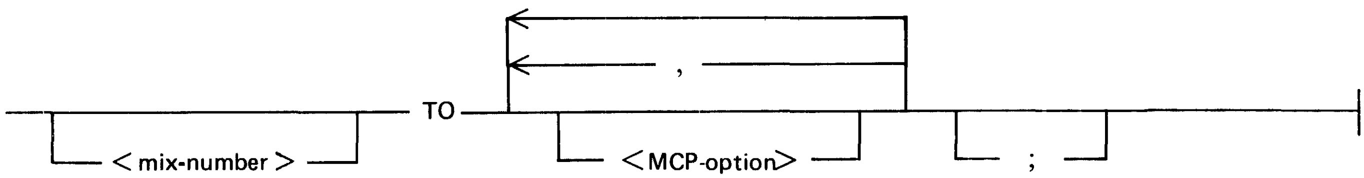
Command	**Response**
TL;	LOG TRANSFERRED TO LOG/#000025
TL ODT	SYSTEM/ODTLOG CHANGED TO ODTLOG/0819860844
TL 500	LOG TRANSFERRED TO LOG/#000083

TO (Type Options)

The TO system command interrogates the status of MCP options. Refer to Section 3 for a complete description of the MCP options.

If <MCP-option> is omitted in the TO system command, all the MCP options and associated settings are displayed. If the MCP option has a value of 1, the MCP option is set. If the MCP option has a value of 0, the MCP option is reset.

Remote ODT syntax:



Semantics:

<MCP-option>
: This field can contain any valid MCP option name and specifies the option to be interrogated. If <MCP-option> is not specified, all the MCP options and their associated settings are displayed.

<mix-number>
: If the mix number of a running program prefaces the TO command, any of the 13 options associated with individual jobs may be interrogated. See Section 3 for a list of these options. At least one <MCP-option> must be specified if a <mix-number> is provided.

Examples:

Command	**Response**
TO LOG	LOG =1
TO BOJ , DATE	BOJ =1 DATE=0
TO	

SYSTEM OPTIONS

AMCS=0	BOJ =1	BREL=1	CHRG=0	CLOS=0	COPY=0	DATE=1	DBUG=0	DMPL=0
DUMP=1	EOJ =1	FLMP=1	LAB =1	LIB =1	LOG =0	MEM =1	MPRI=1	ODTL=1
OPEN=0	PBD =1	PBF =0	PBT =0	RMOV=1	RMSG=0	SCHM=0	SQRM=0	TERM=0
THR =1	TIME=1	TRMD=1	VLCP=1	VLIO=1	WFL =0	ZIP =0		

4113 TO PBF BREL
*LINEAR/ANALYSIS ON DISK =4113 PBF=SET
*LINEAR/ANALYSIS ON DISK =4113 BREL=DEFAULT

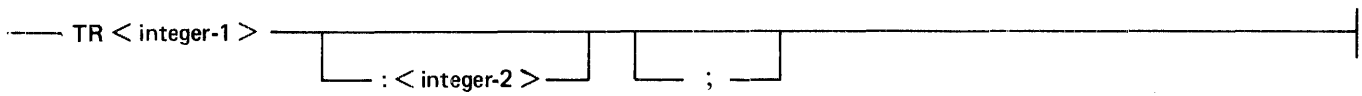
TR (Time Reset)

The TR system command changes the current value of the time maintained by the MCP.

The time specified is designated according to a 24-hour clock, and must be four numeric digits in length.

The MCP displays the new time after the TR system command is entered.

Remote ODT syntax:



Semantics:

<integer-1>
This field, which must contain a 4-digit integer in the range 0000 to 2400 inclusive, specifies the time according to a 24-hour clock.

<integer-2>
The value of this optional field may range from 0 to 59 inclusive and sets the seconds value of the system-maintained time. If <integer-2> is absent, the MCP assumes a value of zero.

Example:

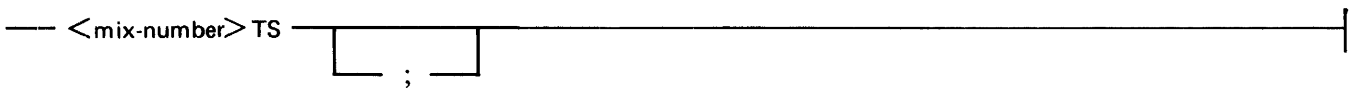
Command	Response
TR 1919	TIME = 19:19:00.0
TR 0802:35	TIME = 08:02:35.0

TS (Test Switches)

The TS system command interrogates the switches set by the SW system command or by the SWITCH program control instruction.

The output of the TS system command is in hexadecimal format.

Syntax:



Semantics:

<mix-number>
: This field, which must contain a mix number of an executing program, specifies the program for which to interrogate the settings of the program switches.

Example:

Command	Response
695 TS	*CANDE ON DISK =695 SWITCHES = @0000010000@

UL (Unlabeled)

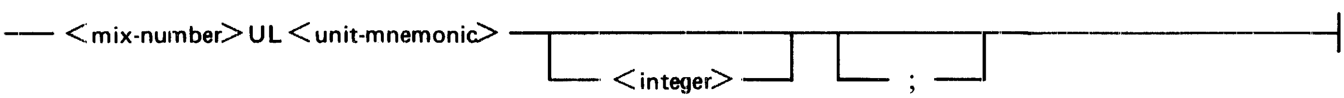
The UL system command designates the device on which a particular unlabeled input file is located. This instruction is entered in response to the following MCP message:

FILE NOT PRESENT

The UL system command is used only if the specified device is to be acted on as an unlabeled file. The MCP assumes that the file on the designated unit is the file requested by the program that caused the FILE NOT PRESENT message. The device specified in the UL system command must be ready when the instruction is entered.

Unlabeled card reader files are not allowed by the MCP. Therefore, the UL system command with a card reader device functions the same as the IL system command.

Remote ODT syntax:



Workstation syntax:

Semantics:

<mix-number>
This field, which must contain a mix number, specifies the program that is requesting the unlabeled file.

<unit-mnemonic>
This field, which must contain a valid unit mnemonic of an input device, specifies the device on which the unlabeled file is located.

<integer>
This field, which must contain an integer, specifies the number of blocks for the MCP to space forward prior to reading the first data block requested by the program.

Examples:

The following UL system command causes the unlabeled input tape file on tape unit MTA to be assigned to the program whose mix number is 7404.

7404 UL MTA;

The following UL system command causes the first three blocks on tape unit MTA to be skipped.

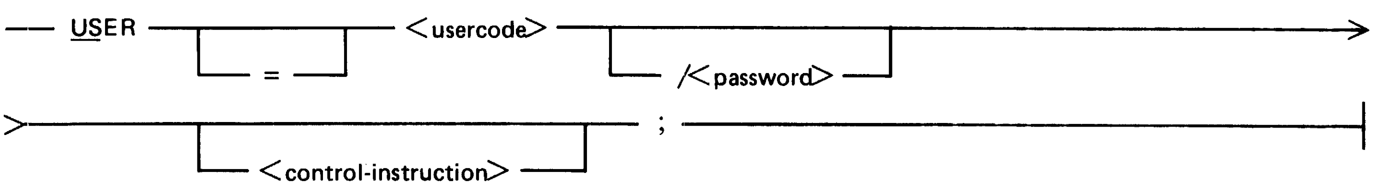
7404 UL MTA 3

USER (Usercode)

The USER system command invokes the MCP file security system mechanism in the MCP and its associated naming convention.

The USER system command causes the MCP to verify <usercode> and <password> against the directory of valid usercodes and associated passwords in the (SYSTEM)/USERCODE file on the SYSTEM disk. The validated usercode is carried with <control-instruction> and is used to apply the MCP file security naming convention to any subsequent file-identifier references.

Syntax:



Semantics:

<usercode>
This field must contain a valid usercode contained in the (SYSTEM)/USERCODE file.

<password>
This field must contain a valid password that belongs to <usercode> and is contained in the (SYSTEM)/USERCODE file.

<control-instruction>
This field can contain any valid MCP command.

Examples:

Command	**Response**
USER SITE/PRIV PD =/=;	PD= MASTER/(SITE)/FILE1 PD= MASTER/(SITE)/FILE2 PD= MASTER/(SITE)/FILE3 END PD
PD (SITE)/=;	PD= MASTER/(SITE)/FILE1 PD= MASTER/(SITE)/FILE2 PD= MASTER/(SITE)/FILE3 END PD
US STUDENT/JK EX TESTPROG PR 3;	STUDENT)/TESTPROG =5 BOJ ...
PD (FINANCE)/CHECKREG;	PD=ACCOUNTING/(FINANCE)/CHECKREG END PD
REMOVE (FINANCE)/CHECKREG;	INVALID REMOVE (FINANCE)/CHECKREG SECURITY ERROR
US FINANCE/VP REMOVE CHECKREG;	ACCOUNTING/(FINANCE)/CHECKREG REMOVED

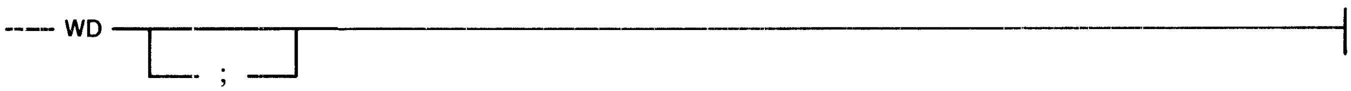
WD (What Date)

The WD system command causes the MCP to display the current date maintained by the MCP.

The date is displayed by the MCP in the following format.

DATE = <month>/<day>/<year> <name-of-day>
(JULIAN DATE = <year><julian-day>)

Syntax:



Example:

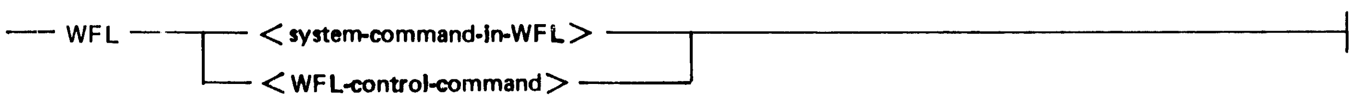
Command	Response
WD;	DATE = 11/18/86 TUESDAY (JULIAN DATE = 86322)

WFL (Work Flow Language)

The WFL system command specifies that WFL syntax is to be used to evaluate the command that follows it. The WFL system command is unnecessary if the WFL option is set or the command is available only in the WFL language.

Four commands, marked with asterisks (*) in the list following the syntax diagram, have the same spelling in control card and WFL syntax. When the WFL option is reset, control card syntax applies to these commands unless the command is preceded by the WFL system command. For example, with the WFL option reset, the command CHANGE implies control card syntax but the command WFL CHANGE implies WFL syntax.

Syntax:



Semantics:

<system-command-in-WFL>
The valid WFL system commands are:

BEGIN JOB	MODIFY *	RUN
CHANGE *	PASSWORD	SECURITY
COMPILE *	REMOVE *	START

<WFL-control-command>
The valid WFL control commands are:

END	EOJ	STOP

These commands are synonymous. Each forces the WFL compiler to end of job.

For a description of the WFL syntax of these commands and information on the WFL system command, refer to the *B 1000 Systems Work Flow Language (WFL) Language Manual.*

Examples:

WFL REMOVE A/B ON YOURPACK, (USER)B;

WFL CHANGE A/B TO C/B, D/L TO H FROM MYPACK;

WM (What MCP)

The WM system command requests information about the MCP and related system software. When the WM system command is entered, the MCP displays a message in the following format:

MCP = "<mcp-name>" VERSION <version>
INTERP = "<interpreter-name>"
GISMO = "<gismo-name>"
INIT = "<initializer-name>"
MICRO-MCP = "<micro.mcp-name>"
NETWORK CONTROLLER = "<network-controller-name>"
MCS = "<message-control-system-name>"
ODT = "<operator-display-terminal-name>"
USERCODE.FILE = "<usercode-file-name>"
PANDA = "<SYSTEM/PANDA program-name>"
DMS ACCESS ROUTINES COMPATIBILITY LEVEL = <integer>
<disk tranformation vector (DD sequence)>
(on B1990 only, if altered from normal)
<system-style-description>
THE FOLLOWING SOFTWARE OPTIONS ARE IN EFFECT:
    <software-options-list>
DISK CACHE PRESENT ON <port, channel; version>

Disk transformation information is displayed on B 1990 systems when the disk order has been changed by means of the DD command.

Syntax:

```
—— WM ─┬─────┬──────────────────────────────────────────┤
       └─ ; ─┘
```

Example:

Command: WM;

Response:

MCP = MCP13/PRERELEASE VERSION 13.0.0; COMPILED 02/18/86
INTERP = SDL2/INTERP3M
GISMO = GISMO3
INIT = SYSTEM-INIT
MICRO-MCP = MCPII/MICRO-MCP
NETWORK CONTROLLER = SYSTEM/CONTROLLER
MCS = SMCS
ODT = DISK/*SYSTEM/ODT
USERCODE FILE = (SYSTEM)/USERCODE
PANDA = SYSTEM/PANDA
BNA <NULL>
DMS ACCESS ROUTINES COMPATIBILITY LEVEL = 2.
DISK TRANSFORMATION VECTOR: 30124567
SYSTEM IS A B1900 DUAL PROCESSOR WITH 2048K BYTES OF MEMORY
THE FOLLOWING SOFTWARE OPTIONS ARE IN EFFECT:
    PRIORITIZED MEMORY MANAGEMENT WITH THRASH COUNTING
    GISMO TRACING
DISK CACHE PRESENT ON PORT 7, CHANNEL 9;
        CACHE VERSION=02/04/85

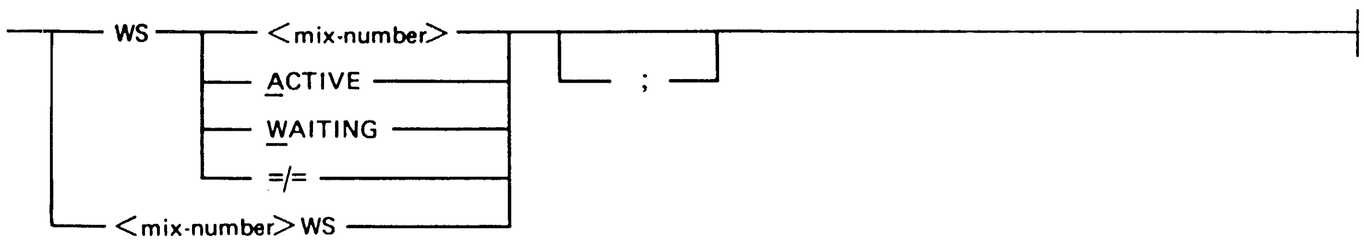
WS (What's in the Schedule)

The WS system command displays the status of programs in the schedule.

The response to the WS system command has the following format.

<mix-number> <program-name> WILL USE <integer>KB, SCHED PR = <priority>, IN FOR <hours>:<minutes>:<seconds>.<tenths-of-a-second>, <waiting-reason>, or JOB QUEUE=<class>

Syntax:



Semantics:

<mix-number>
This field, which must contain a mix number, specifies the program to interrogate.

ACTIVE
The ACTIVE keyword causes all the program names in the tasking schedule to be displayed.

WAITING
The WAITING keyword causes all the program names in the waiting schedule to be displayed.

=/=
The =/= keysymbol causes all program names in the waiting schedule, tasking schedule, and job queues to be displayed.

Examples:

Command	Response
WS 40;	#40 *ALPHA ON DISK WILL USE 8 KB, SCHED PR = 4, IN FOR 00:008:37.4, JOB QUEUE=0.
WS ACTIVE	ACTIVE SCHEDULE EMPTY
WS W	WAITING SCHEDULE EMPTY

WT (What Time)

The WT system command causes the MCP to display the current time.

The following format is displayed in response to the WT system command.

TIME = <hours>:<minutes>:<seconds>.<tenths-of-a-second>

The time displayed is based on a 24-hour clock. For example, 08:10:25.3 AM is displayed as 08:10:25.3, and 08:10:25.3 PM is displayed as 20:10:25.3.

Syntax:

Example:

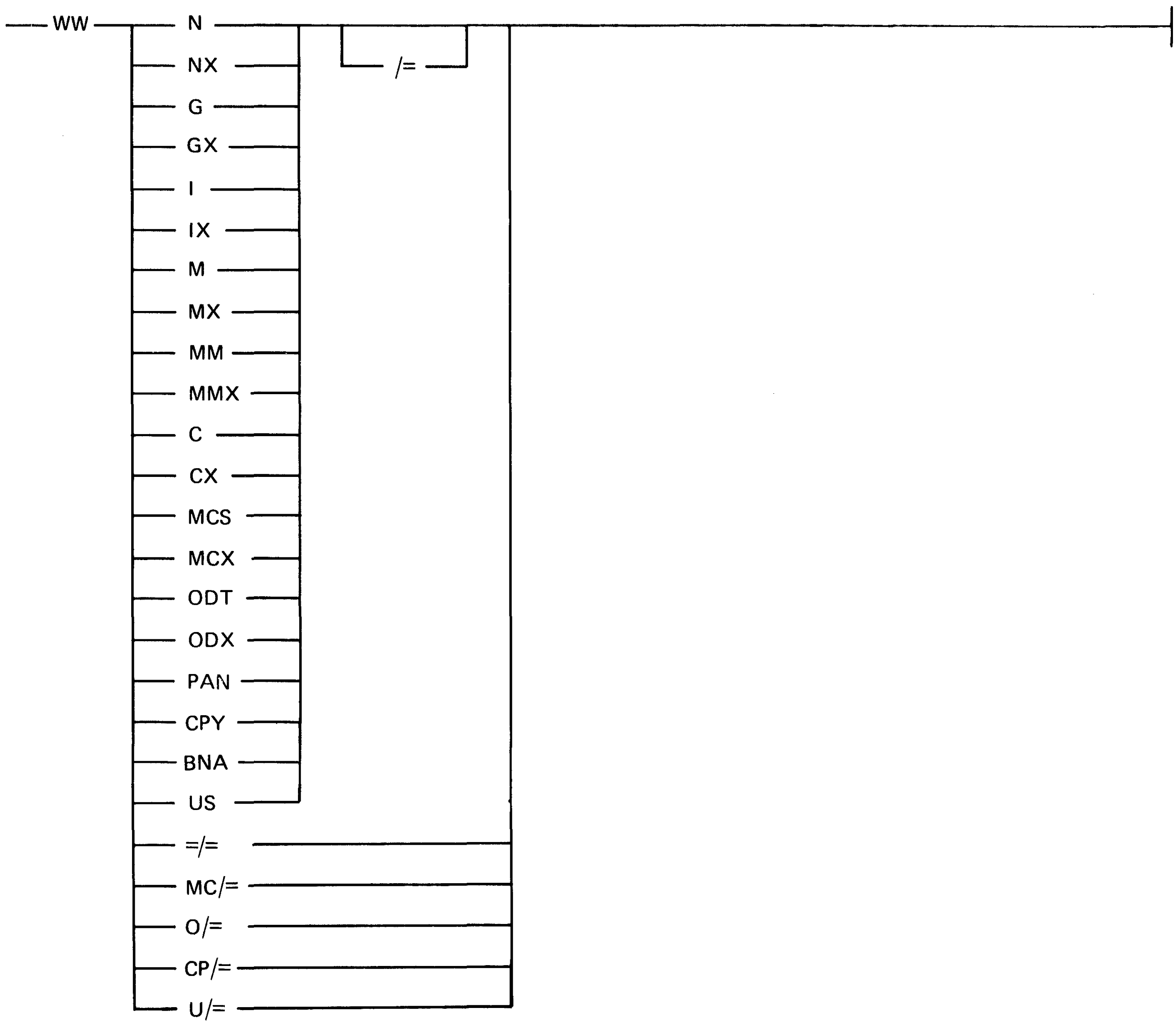
Command	Response
WT	TIME = 09:46:39.9

WW (What Name Table)

The WW system command lists the various types of system software/firmware in the MCP Name Table.

Refer to the CLEAR/START program in the *B 1000 Systems System Software Operation Guide, Volume 2*, for a complete description of the MCP Name Table entries.

Remote ODT syntax:



Semantics:

N
: The N keysymbol causes the current Name Table entry in the N (SYSTEM/INIT program) slot to be displayed. If the optional /= keysymbol is included, the entry in the NX (experimental SYSTEM/INIT program) slot is also displayed.

NX
: The NX keysymbol causes the current Name Table entry in the NX (experimental SYSTEM/INIT program) slot to be displayed. The optional /= keysymbol has no effect.

G
: The G keysymbol causes the current Name Table entry in the G (GISMO firmware) slot to be displayed. If the optional /= keysymbol is included, the entry in the GX (experimental GISMO firmware) slot is also displayed.

GX
: The GX keysymbol causes the current Name Table entry in the GX (experimental GISMO firmware) slot to be displayed. The optional /= keysymbol has no effect.

I
: The I keysymbol causes the current Name Table entry in the I (SDL2/INTERP interpreter) slot to be displayed. If the optional /= keysymbol is included, the entry in the IX (experimental SDL2 interpreter) slot is also displayed.

IX
: The IX keysymbol causes the current Name Table entry in the IX (experimental SDL2 interpreter) slot to be displayed. The optional /= keysymbol has no effect.

M
: The M keysymbol causes the current Name Table entry in the M (MCPII program) slot to be displayed. If the optional /= keysymbol is included, the entry in the MX (experimental MCPII program) slot is also displayed.

MX
: The MX keysymbol causes the current Name Table entry in the MX (experimental MCPII program) slot to be displayed. The optional /= keysymbol has no effect.

MM
: The MM keysymbol causes the current Name Table entry in the MM (MCPII/MICRO-MCP program) slot to be displayed. If the optional /= keysymbol is included, the entry in the MMX (experimental MCPII/MICRO-MCP program) slot is also displayed.

MMX
: The MMX keysymbol causes the current Name Table entry in the MMX (experimental MCPII/MICRO-MCP program) slot to be displayed. The optional /= keysymbol has no effect.

C
: The C keysymbol causes the current Name Table entry in the C (network controller) slot to be displayed. If the optional /= keysymbol is included, the entry in the CX (experimental network controller) slot is also displayed.

CX
: The CX keysymbol causes the current Name Table entry in the CX (exprerimental network controller) slot to be displayed. The optional /= keysymbol has no effect.

MCS
: The MCS keysymbol causes the current Name Table entry in the MCS (MCS program) slot to be displayed. The optional /= keysymbol has no effect.

MCX

The MCX keysymbol causes the current Name Table entry in the MCX (experimental MCS program) slot to be displayed. The optional /= keysymbol has no effect.

ODT

The ODT keysymbol causes the current Name Table entry in the ODT (SYSTEM/ODT program) slot to be displayed. The optional /= keysymbol has no effect.

ODX

The ODX keysymbol causes the current Name Table entry in the ODX (SYSTEM/ODT program) slot to be displayed. The optional /= keysymbol has no effect.

PAN

The keysymbol PAN identifies the current Name Table entry in the PAN (SYSTEM/PANDA program) slot to be displayed. The optional /= keysymbol has no effect.

CPY

The CPY keysymbol causes the current Name Table entry in the CPY (SYSTEM/COPY program) slot to be displayed. The optional /= keysymbol has no effect.

BNA

The BNA keysymbol causes the current Name Table entry in the BNA (BNA/NSM program) slot to be displayed. The optional /= keysymbol has no effect.

US

The US keysymbol causes the current Name Table entry in the US ((SYSTEM)/USERCODE file) slot to be displayed. The optional /= keysymbol has no effect.

=/=

The =/= keysymbol causes the current Name Table entry in all the Name Table slots to be displayed.

MC/=

The MC/= keysymbol causes the current Name Table entries in the MCS (MCS program) slot and the MCX (experimental MCS program) slot to be displayed.

O/=

The O/= keysymbol causes the current Name Table entries in the ODT (SYSTEM/ODT program) slot and the ODX (experimental SYSTEM/ODT program) slot to be displayed.

CP/=

The CP/= keysymbol causes the current Name Table entry in the CPY (SYSTEM/COPY program) slot to be displayed.

U/=

The U/= keysymbol causes the current Name Table entry in the US ((SYSTEM)/USERCODE file) slot to be displayed.

Examples:

Command	Response
WW M/=;	M = MCPII MX = MCPII/OLD
WW US;	US = (SYSTEM)/USERCODE
WW CX;	CX = SYSTEM/CONTROLLER

WY (Why)

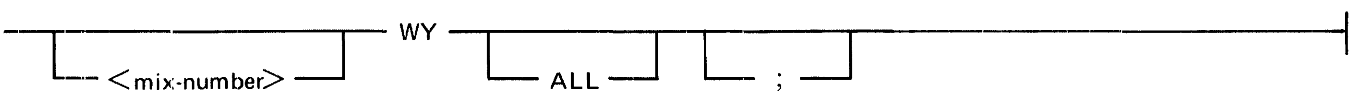
The WY system command displays the priority and current status of one or all programs in the mix. The WY system command functions identically to the MX system command.

If the WY system command is prefaced with a mix number, only information about that specific program is displayed. If the mix number is omitted, information about all visible tasks in the mix is displayed. Refer to the IV system command for information concerning task invisibility. If the optional ALL keyword is included, information about all tasks, including invisible tasks, is displayed.

If a program is awaiting operator action, the information displayed includes the action alternatives available to the operator.

If the MPRI MCP option is set, the processor and memory priorities are displayed instead of the priority number.

Syntax:



Semantics:

<mix-number>
: This field must contain a valid mix number of a program currently in the mix and specifies the task in which to interrogate the priority and status.

ALL
: The ALL keyword specifies that information about all tasks, including invisible tasks, is to be displayed.

The following examples assume that the MPRI MCP option is set. If the MPRI MCP option is not set, the priority number is displayed instead of the processor and memory priorities.

Examples:

Command	**Response**
WY;	*SMCS ON DISK =308 PP=13, MP=13 "WAIT" STATUS *CANDE ON DISK =321 PP=12, MP=12 "WAIT" STATUS *RD ON DISK =310 PP=11, MP=11 "WAIT" STATUS *SYCOM ON DISK : *PS ON DISK =311 PP=9, MP=9 "WAIT" STATUS 6 PROGRAMS RUNNING...END MX/WY.
WY ALL;	*SYSTEM/ODT ON DISK =304 PP=15, MP=15 EXECUTING *SYSTEM/CONTROLLER ON DISK =303 PP=15, MP=15 EXECUTING *SMCS ON DISK =308 PP=13, MP=13 "WAIT" STATUS *CANDE ON DISK =321 PP=12, MP=12 "WAIT" STATUS *RD ON DISK =310 PP=11, MP=11 "WAIT" STATUS *SYCOM ON DISK : *PS ON DISK =311 PP=9, MP=9 "WAIT" STATUS 6 PROGRAMS RUNNING...END MX/WY.
321WY;	*CANDE ON DISK =321 PP=12, MP=12 "WAIT" STATUS

XC (Remove Segments Temporarily)

The XC system command temporarily removes contiguous disk segments from the MCP tables of available disk space.

The disk space to be removed must be available in order to be removed. If any portion of the space is occupied, for example with a file or disk file header, the MCP rejects the request with the following message.

REQUESTED SEGMENTS NOT REMOVED—NOT AVAILABLE

If the disk is a SYSTEM disk, the disk space is returned after the next CLEAR/START operation. If the disk is a user disk, the disk space is returned after the user disk has been powered down with the PO system command.

Remote ODT syntax:

```
— XC ─┬─ <unit-mnemonic> ──┬─ <integer-2><integer-3> ─┬─────┬──────────┤
      └─ DKx <integer-1> ──┘                          └─ ; ─┘
```

Semantics:

<integer-1>
This field, which must contain an integer, specifies the electronics unit (EU) for the head-per-track disk.

<integer-2>
This field, which must contain an integer, specifies the beginning segment address, and can be expressed in any format. If the operation is being performed on a disk cartridge (DCx), and the beginning segment address is not the address of the first segment in a track, the MCP automatically adjusts it backward to the beginning of the track.

<integer-3>
This field, which must contain an integer, specifies the number of disk segments to be removed. If the operation is being performed on a disk cartridge, the number of segments removed is a multiple of the entire track. The MCP makes the necessary adjustments, both in starting address and number of segments.

Examples:

Command	Response
XC DKA 0 200 1000;	DISK SPACE REMOVED FROM @EE00000C8@ THRU @EE00004AF@
XC DPC @46@ 30;	DISK SPACE REMOVED FROM @F22000046@ THRU @F22000063@

XD (Remove Segments Permanently)

The XD system command permanently removes contiguous disk segments from the MCP tables of available disk space.

The disk space to be removed must be available in order to be removed. If any portion of the space is occupied, for example with a file or disk file header, the MCP rejects the request with the following message.

REQUESTED SEGMENTS NOT REMOVED—NOT AVAILABLE

To return the removed disk segments, a disk initialization (for user disks) or coldstart operation (for head-per-track disks) must be performed.

Remote ODT syntax:

```
----XD ---┬-- <unit-mnemonic> ---┬--- <integer-2> <integer-3> ---┬---------┬-------------|
          └-- DKx <integer-1> ---┘                               └--- ; ---┘
```

Semantics:

<integer-1>
This field, which must contain an integer, specifies the electronics unit (EU) for the head-per-track disk.

<integer-2>
This field, which must contain an integer, specifies the beginning segment address, and can be expressed in any format. If the operation is being performed on a disk cartridge (DCx) and the beginning segment address is not the address of the first segment in a track, the MCP automatically adjusts the address backward to the beginning of the track.

<integer-3>
This field, which must contain an integer, specifies the number of disk segments to be removed. If the operation is being performed on a disk cartridge, the number of segments removed is a multiple of the entire track. The MCP makes the necessary adjustments, both in starting address and number of segments.

Examples:

Command	Response
XD DKA 0 200 1000;	DISK SPACE REMOVED FROM @EE00000C8@ THRU @EE00004AF@
XD DPC @46@ 30;	DISK SPACE REMOVED FROM @F22000046@ THRU @F22000063@

SECTION 6
NETWORK CONTROLLER OPERATIONS

Network Controller Execution

After the network controller program is compiled, it can be executed in two ways: explicitly or automatically.

The network controller can be explicitly executed using the following MCP control instruction:

EXECUTE <network-controller-program-identifier>;

To execute the network controller automatically by the MCP, the name of the network controller must be specified to the MCP. This is done by placing the identifier of the network controller program into the C entry, or slot, of the MCP Name Table using the following MCP command:

CM C <network-controller-program-identifier>

An experimental network controller can be placed in the CX entry, or slot, of the MCP Name Table using the following MCP command:

CM CX <network-controller-program-identifier>;

Network Controller Priority

For optimum response time for the remote programs, it is strongly suggested that the network controller run at a higher priority than other tasks in the mix. The network controller is automatically assigned a priority of 15 by the NDL compiler and the invisible bit is set.

Network Controller Program Switches

The network controller program switches are described in the following paragraphs.

Program Switch 2

Program switch 2 controls the network controller handling of a data communication line that is hung or not responding properly. In all cases of line hangs, a message is displayed on the ODT. The following action is then taken depending on the value of program switch 2.

0 A program dump is taken and the line is restarted.
1 The line is restarted.
2 The line is left in a hung status.
3-15 The network controller is suspended until the operator responds by entering the NC ODT command.

Program Switch 3

Program switch 3 controls the initial accumulation of statistics by the network controller. The following action is taken depending on the value of program switch 3.

0 The statistics function is controlled by the STATISTICS declaration in the network controller symbolic code.
1 Unconditionally inititate accumulation of statistics from beginning of job.
2 Do not initiate accumulation of statistics regardless of the STATISTICS declaration in the network controller symbolic code.
3-15 Same as for program switch 3 equal to 0.

Program Switch 7

If the network controller program switch 7 is set to 1, the IOLOG debugging facility is initiated at beginning of job.

Network Controller Input Commands

Input commands direct the network controller to perform specific functions. The system commands are described in the following paragraphs. All ODT system commands are prefixed by the MCP NC command, or optionally, by the network controller mix number and the MCP AX or AC keywords.

Common Syntax

The following syntactic items described in this section are used in the specification of the syntax of one or more network controller commands. The items are presented alphabetically for quick reference.

<line-id>

The <line-id> is used to specify the line for which the command is to be performed.

Syntax:

```
──┬── <line-address> ──┬──────────────────────────────────────┤
  ├── <line-number> ───┤
  └── <line-name> ─────┘
```

Semantics:

<line-address>
: This field can contain the port, channel, and adapter declared for the line in the network controller symbolic code. The format of the <line-address> is <port>:<channel>:<adapter>.

<line-number>
: This field can contain the logical number of the line as declared in the network controller symbolic code.

<line-name>
: This field can contain the symbolic name assigned to the line in the network controller symbolic file.

Examples:

2:0:0

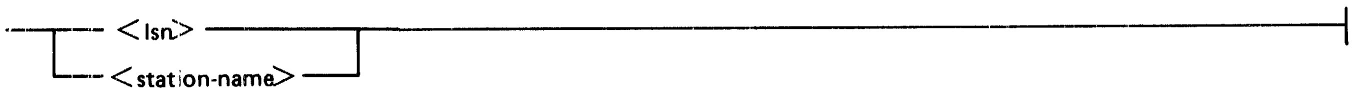
1

TDLINE4

<station-id>

This field can contain the station for which the command is to be performed.

Syntax:



Semantics:

<lsn>
The <lsn> field specifies logical station number of the station.

<station-name>
The <station-name> field specifies symbolic name assigned to the station in the network controller symbolic file.

Examples:

13

AARDVARK

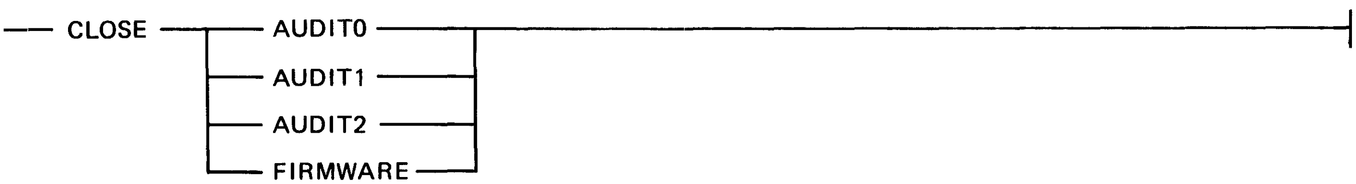
ODT Commands

The following paragraphs describe the NC ODT commands.

CLOSE Command

The CLOSE network controller command closes the specified network controller audit file or the currently open firmware file.

Syntax:



Semantics:

AUDIT0, AUDIT1, and AUDIT2

The AUDIT0, AUDIT1, and AUDIT2 keywords specify which audit file to close. AUDIT0 specifies the first audit file declared in the network controller symbolic file. AUDIT1 specifies the second audit file declared and AUDIT3 specifies the third audit file declared.

FIRMWARE

The FIRMWARE keyword causes the currently open firmware file to be closed.

If the firmware file is open in the network controller code file, the sole effect of the CLOSE FIRMWARE command is a temporary saving of memory. If the firmware file is open external to the network controller code file, the CLOSE FIRMWARE command releases the external firmware file for removal or replacement.

Examples:

CLOSE AUDIT0

CLOSE FIRMWARE

DATARATE Command

The DATARATE network controller command sets or resets the CCITT data rate for the B 1990 system. Since the B 1990 system obtains the data rate value from the data communication controls and line adapters, the DATARATE command needs only the name of the line adapter or the hardware address as specified in the network controller program.

Syntax:

```
───┬── RESET ──┬─── DATARATE LINE <line-id> ──────────────────────────────────┤
   └── SET ────┘
```

Semantics:

RESET
The RESET keyword causes the CCITT data rate to be reset.

SET
The SET keyword causes the CCITT data rate to be set.

Examples:

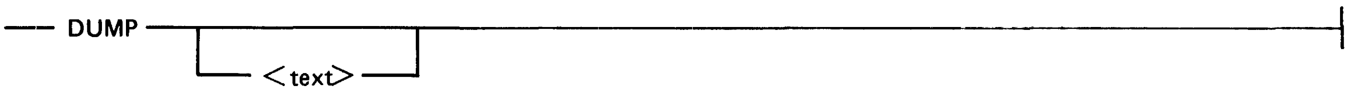
SET DATARATE LINE TDLINE1

RESET DATARATE LINE 2:0:0

DUMP Command

The DUMP network controller command causes a program dump of the network controller to be created.

Syntax:



Semantics:

<text>
This field specifies the message that is to appear in the analyzed dump and can be used to identify the reason for the dump.

Examples:

DUMP

DUMP Beware of rainy days and Mondays.

HELP Command

The HELP network controller command displays a list of available network controller commands or a syntax diagram of the specified command.

Syntax:

```
--- HELP --+---------------+------------------------------------|
           |               |
           +-- <command> --+
```

Semantics:

<command>
The field specifies the command for which the syntax diagram is to be displayed.

Examples:

HELP

HELP STATUS

IOLOG Command

The IOLOG network controller command initiates or queries the setting of the IOLOG facility.

Syntax:

Semantics:

OFF
: Specifying the OFF keyword causes the IOLOG facility to be turned off.

ON
: Specifying the ON keyword causes the IOLOG facility to be initiated.

Pragmatics:

The IOLOG facility monitors the data communication line activity, writing the information to a disk file labeled DC/AUDITFILE.

If no keyword is specified in the IOLOG command, the current status of the IOLOG facility is returned.

Examples:

IOLOG ON

IOLOG OFF

IOLOG

MAKE Command

The MAKE network controller command makes a station that is not controlled by a Message Control System (MCS) ready or not ready.

Syntax:

```
--- MAKE STATION <station-id> --+-------+-- READY ---------------------------|
                                +- NOT -+
```

Semantics:

NOT
   The NOT keyword specifies that the station is to be made not ready.

Examples:

MAKE STATION AARDVARK NOT READY

MAKE STATION 29 NOT READY

MAKE STATION 72 READY

MAKE STATION WOMBAT READY

QUIT Command

The QUIT network controller command terminates the network controller.

If the QUIT command is entered, the network controller terminates after all files are closed, regardless of the state of the line and the number of messages queued for delivery to stations.

On B 1990 systems, the MCP immediately executes a new copy of the network controller program. The name of the network controller is taken from the CX entry of the MCP Name Table if an experimental version of the network controller is running when the QUIT command is entered; otherwise, the name of the network controller is taken from the C entry in the MCP Name Table.

Syntax:

```
—— QUIT ——————————————————————————————————————————————————————————|
```

Example:

QUIT

RELOAD LINE Command

The RELOAD LINE network controller command reloads firmware loaded into the requested line for a MLC-4 quad line adapter.

When the RELOAD LINE command is entered, all four lines on the quad adapter are interrupted if they are under the control of the network controller. After the firmware is reloaded, the relevant line configurations are loaded into the line adapter and a RESTART LINE command is automatically performed for each line.

The RELOAD LINE command is not accepted for multiline controls other than the MLC-4 quad line adapter.

Syntax:

```
---- RELOAD LINE <line-id> ----------------------------------------|
```

Examples:

RELOAD LINE TDLINE

RELOAD LINE 2:0:1

RELOAD LINE 5

RELEASE LINE Command

The RELEASE LINE network controller command releases a line from the control of the network controller for use with another data communication program, such as HASP or RJE programs.

Syntax:

```
—— RELEASE LINE <line-id> ——————————————————————————————————————————|
```

Pragmatics:

When a RELEASE LINE command is entered, the adapter is unconditionally cleared, marked as not present, and the line released to the system.

Examples:

RELEASE LINE TDLINE5

RELEASE LINE 2:0:4

RELEASE LINE 5

RESTART LINE Command

The RESTART LINE network controller command clears line adapters that are suspected of an improper (or lack of) response and changes the line address of the line.

Syntax:

```
---- RESTART LINE <line-id> --+--------------------+--------------------|
                              |                    |
                              +-- <new-address> ---+
```

Semantics:

<new-address>
: This field specifies the port, channel, and adapter of the new line address. <new-address> has the following format:

    <port> : <channel> : <adapter>

Pragmatics:

When a RESTART LINE command is entered, the network controller unconditionally clears the line adapter. If the line was marked as not present, meaning that it was never accessed or that it was released using the RELEASE LINE command, the network controller tests for the presence and the line adapter type of the adapter.

The network controller then takes the appropriate action depending on what the status of the line was prior to the entry of the RESTART LINE command.

1. If the line was originally marked as not present, disconnected ready, waiting for dialout, or waiting for a LOGICALACK, no further action is taken.
2. If the line was originally in ring I/O status (waiting for an incoming call), the line is returned to ring I/O status to wait for an incoming call.
3. If the line was in the process of dialing out, the dialout operation is resumed.
4. If the line was in any other state, the line control procedure is entered with LINE(CONTROL KEY) equal to 1.

<new-address> option allows the address of the line to be changed. <new-address> option is only valid if the line is in a released/not present status.

Examples:

RESTART LINE TDLINE5

RESTART LINE 2:0:4

RESTART LINE 5

RESTART LINE LINE13 2:0:7

STANDBY Command

The STANDBY network controller command sets or resets the CCITT standby feature for the B 1990.

Syntax:

```
──┬── RESET ──┬── STANDBY <line-id> ──────────────────────────┤
  └── SET ────┘
```

Semantics:

RESET
The RESET keyword causes the CCITT standby feature to be reset.

SET
The SET keyword causes the CCITT standby feature to be set.

Examples:

RESET STANDBY 2:0:10

SET STANDBY LINE4

STATISTICS Command

The STATISTICS network controller command displays the current status of the statistics function, initiates or terminates the statistics function, and closes the current statistics file.

Syntax:

```
---- STATISTICS --+-------------+--------------------------------------|
                  |             |
                  +--- OFF -----+
                  +--- ON ------+
                  +--- SWITCH --+
```

Semantics:

OFF
  The OFF keyword causes the statistics function to be terminated and the statistics file to be closed.

ON
  The ON keyword causes the statistics function to be initiated.

SWITCH
  The SWITCH keyword causes the current statistics file to be closed and a new statistics file to be opened.

Examples:

STATISTICS

STATISTICS OFF

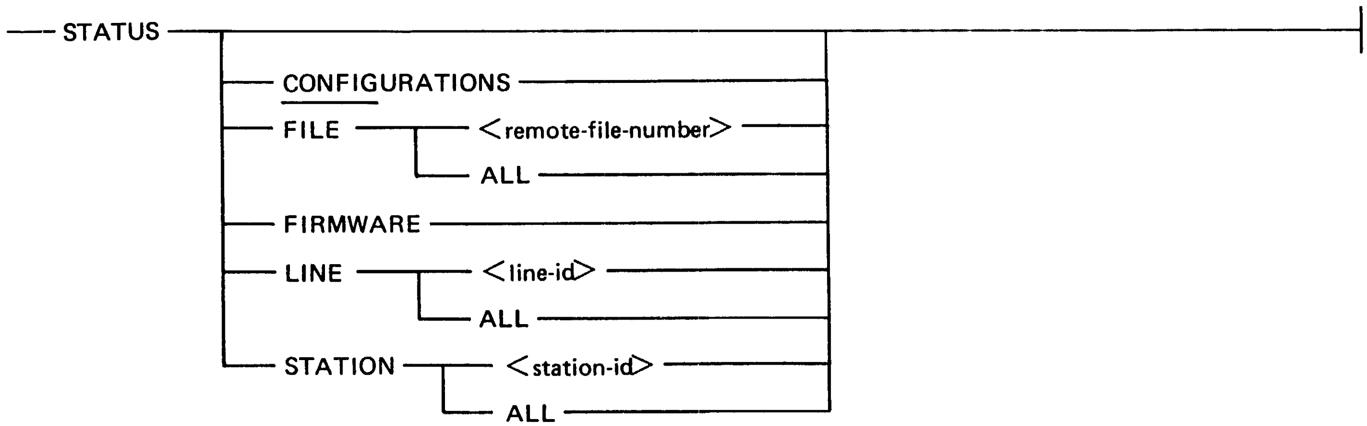
STATISTICS ON

STATISTICS SWITCH

STATUS Command

The STATUS network controller command displays the version of the network controller, line status, station status, file status, firmware status, and configuration status.

Syntax:



Semantics:

<remote-file-number>
This specifies the logical number of the file as it is opened by the network controller.

FILE ALL
The FILE ALL option causes the status of all open remote files to be displayed.

LINE ALL
The LINE ALL option causes the status of all the lines declared in the network controller to be displayed.

STATION ALL
The STATION ALL option causes the status of all the stations declared in the network controller to be displayed.

Pragmatics:

When the status of a line is requested, the network controller displays the line status, the adapter type, and the number of messages queued for that line.

When the status of a station is requested, the network controller displays the station type, the number of messages queued, and the primary and secondary file status for the station.

When the status of a file is requested, the network controller displays information about the remote file number requested. If the ALL option is specified, the status of all open remote files is displayed.

When the status of the firmware is requested, the network controller displays the title of the firmware files being used and their levels.

When the status of the configurations is requested, the network controller displays the title of the configurations file being used, its update date, and its level.

If no options are specified, the release version of the SYSTEM/CONTROLLER program is displayed.

Examples:

STATUS

STATUS CONFIG

STATUS FILE 4

STATUS FILE ALL

STATUS FIRMWARE

STATUS LINE 5

STATUS LINE TDLINE5

STATUS LINE 2:0:4

STATUS LINE ALL

STATUS STATION 22

STATUS STATION PLATYPUS

STATUS STATION ALL

Data Communications ODT

The SYSTEM/ODT program can operate with either the multiline control or the ODT control. This feature of an ODT running through the multiline control is referred to as a data communication ODT.

The data communication ODT implementation is mandatory for the B 1990 systems and optional for all other B 1000 systems.

To run a data communication ODT, it is required that an MT 985 terminal be configured to run two pages of 1920 characters each. The MT 985 terminals have Mark 3.8 (or later) firmware installed and firmware location A0 must be set.

NOTE

Due to changes in the Mark 3.8 firmware in the MT 985 terminal, an explicit exit forms mode sequence (4″27″ X) must be sent for every message intended to clear a screen that is already in forms mode. Prior to the Mark 3.8 firmware, or if firmware location A0, bit 1 is reset, the receipt of a SOH character that precedes a data communication message takes the station out of forms mode.

For user programs that utilize forms mode to function correctly on a data communication ODT, the exit forms mode sequence should precede each message.

Differences Between Data Communications and ODT-Control ODT Device

The data communications ODT behaves functionally the same as an ODT device connected to an ODT control with the following exceptions:

1. All ODT output is directed to page 2 of the ODT. Page 1 is used for register information on the B 1990 systems when the system is interrupted or halted.
2. The SPCFY key is used to change pages on the data communication ODT. The CTRL → (right arrow) key sequence should never be used to change pages on a data communication ODT; unpredictable results can occur as a result of using the CTRL → (right arrow) key sequence to change pages. At network controller beginning of job, the SPCFY key must be depressed three times to initially change pages; after the initial change of pages, the SPCFY key need only be depressed once.

Using the Data Communications ODT as a Terminal

As a consequence of the implementation of the data communication ODT, it is now possible to run user programs on the ODT with the following restrictions:

1. Only page 1 of the terminal is available for use.
2. The SPCFY key cannot be used by the program.
3. If forms mode is to be used, the Mark 3.8 (or later) firmware in the MT 983 terminal must be used. In addition, firmware location A0/1 must be set.

The following procedures are used to run the CANDE program on the data communication ODT. For the purposes of this discussion, it is assumed that the SMCS program is the Supervisory Message Control System (MCS) and that the SMCS program is currently running in the mix.

1. Attach the data communication ODT to the SMCS program using the SMCS ATTACH command as follows:

   <SMCS mix number> AX ATTACH SYSTEMODT

2. Change to page 1 of the data communication ODT by depressing the SPCFY key on the ODT keyboard. All user programs are run on page 1. When the data communication ODT is attached to a user program such as the CANDE program, all input from page 1 of the data communication ODT is directed to the user program and all input from page 2 is directed to the SYSTEM/ODT program. If the CTRL → (right arrow) or CTRL ← (left arrow) control sequences are used to change pages, the network controller may direct the input to the wrong program.
3. Log on to the SMCS program, if desired, by entering a valid usercode/password pair.

   USER APTERYX/KIWI

4. Sign on to the CANDE program by entering the following.

   SIGN ON CANDE

The user can now edit a work file and perform other CANDE functions.

The user can also execute programs that open a remote file that is file-equated to the system ODT as follows. The SYSTEM/CONFIGURE program is used as an example:

1. Execute the SYSTEM/CONFIGURE program as follows:

   EXECUTE SYSTEM/CONFIGURE FILE REMOTE STATIONS SYSTEMODT;

2. Change to page 1 of the data communication ODT by depressing the SPCFY key on the ODT keyboard. All user programs are run on page 1.
3. Enter the appropriate specifications to the SYSTEM/CONFIGURE program.

The above examples can be applied to any user program. If it is desired to enter ODT commands, the user can switch to page 2 (using the SPCFY key) and enter the ODT command. All ODT output is directed to page 2.

SECTION 7
SYSTEM OUTPUT MESSAGES

The B 1000 system communicates information to the operator through the Operator Display Terminal (ODT). This information is communicated in the form of system output messages. System output messages are originated by the MCP in response to an operator inquiry or action (for example, in response to the BB, MX, or TI system commands), or in response to a specific requirement of an executing program (for example, the FILE NOT PRESENT or NO MEMORY messages). Output messages can also be originated by executing programs using DISPLAY or ACCEPT messages. These messages are preceded by a percent sign (%) character, in order to distinguish them from system messages concerning a requirement of the program.

All system output messages are indented one space to enable the operator to distinguish them from system commands. Continuation lines of system output messages are indented two spaces.

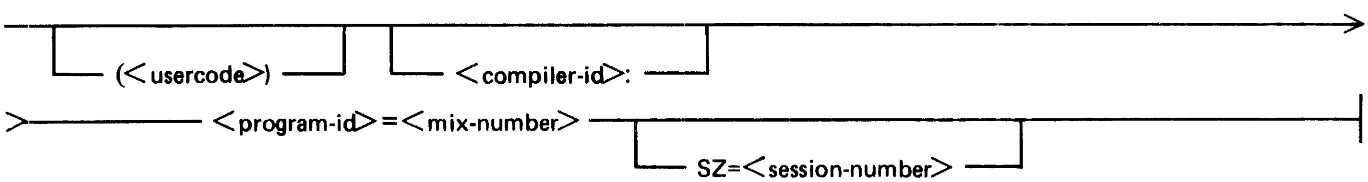
Output Message Syntax

The following paragraphs describe the syntax used in this section to describe several common portions of system output messages.

<task-specifier>

The <task-specifier> portion of a system output message is used by the MCP to identify the program to which the message applies. Messages which reference programs are always preceded by the <task-specifier>. Messages of a general system nature which do not concern a specific program have no <task-specifier> prefix.

The format of the <task-specifier> is as follows:



The <usercode> portion of the <task-specifier> is included if the program was executed with a usercode/password (refer to File Security in section 1 for details).

The <compiler-id> portion of the <task-specifier> is included if the COMPILE program control instruction is used. In this case, the <program-id> portion is the identification of the program being compiled, and the <compiler-id> portion specifies the compiler being used.

The <mix-number> portion of the <task-specifier> is present in all system output messages referencing an executing program, and is the means used to relate system commands to the programs they reference. The <mix-number> is assigned to a program when it is scheduled for execution by the MCP, and remains the same all during the life of the job (scheduling, beginning of job, execution, and end of job). The <mix-number> is the only unique entity that identifies a program while it is scheduled or executing, since multiple copies of the same program (by name) can be in the schedule or the mix concurrently. The <mix-number> assigned by the MCP is incremented by 1 starting with the number 1, which is the first task executed after a coldstart operation, and increases to 9999, at which time a task is assigned the number 1 again.

The <session-number> portion of the <task-specifier> is included only if the referenced program is spawned by another program, and the control string included an SZ command specifying a <session-number>.

<priority>

The <priority> portion of a system output message assumes one of the following forms:

```
---- PRIORITY=<processor-priority> ------------------------------------------|

---- PP=<processor-priority>, MP=<memory-priority> --------------------------|
```

The second form is used only when Level Three (Priority Memory Management) of the MCP Memory Management System is in effect (that is, the MPRI MCP option is set).

<abort-reference>

The <abort-reference> portion of a system output message is included as part of the message describing an error condition in a program that caused an abnormal termination.

The format of the <abort-reference> is:

```
---- : -------------------- S=&lt;segment&gt;, D=<displacement> -------------------->
       |                 |
       --- P=<page>, -----

>------------- (<hex-value>) ------------------------------------------------|
                               |             |
                               --- DS OR DP. -
```

<page>, <segment>, and <displacement> are decimal integers specifying the code segment address of the NEXT INSTRUCTION POINTER, which is the instruction immediately following the one in which the error condition was detected. <hex-value> specifies the hexadecimal equivalent of the NEXT INSTRUCTION POINTER, as follows:

```
-------------------------- @<hex-segment>@, @<hex-displacement>@ -----------|
   |                    |
   --- @<hex-page>@, ----
```

The DS OR DP portion of the <abort-reference> is included only if the TERM and TRMD MCP options are reset. In this case, an explicit DS or DP system command must be entered by the operator in order to complete termination of the program. If either the TERM or TRMD MCP option is set, the DS OR DP portion is not included, and termination of the program is automatically performed by the MCP (including a memory dump of the program, if the TRMD MCP option is set).

The <page> and <hex-page> portions of the <abort-reference> are included only if the abnormally terminated program was written in NDL, SDL, SDL2, UPL, or UPL2 (the only languages having a paged code segment dictionary).

<time>

The current time-of-day is displayed in certain system output messages, and is always in the following format:

—— <hours> : <minutes> : <seconds> . <tenths-of-seconds> ——————————————|

The time-of-day is always maintained in military format, based on a 24-hour clock. For example, 08:10:25.3 is 08:10:25.3 AM and 20:10:25.3 is 08:10:25.3 PM.

<date>

The current date is displayed in certain system output messages, and is always in the following format:

—— < month > / < day > / < year > <name-of-day > (JULIAN DATE= < year > < julian-day >) ——————|

SECTION 8
SYSTEM HALTS

When a software-controlled halt occurs on a B 1000 system, various registers are used to display information about the halt. The most important of these is the L register, which is considered the primary halt definition. Some halts display further descriptive information in other registers (usually X, Y and T).

The L register is functionally divided into two portions.

1. The left-most 16 bits (bits 0-15) describe the specific program or routine that halted, as follows:

@0000@	SDL2 and SDL Interpreter STATE light ON — MCP STATE light OFF — Normal-state SDL program
@0200@	Micro MCP
@0D00@	GISMO
@000F@	CLEAR/START
@00F0@	SYSTEM/INIT

2. The right-most 8 bits (bits 16-23) give the halt identification. This portion of the halt code is dependent upon the specific routine that halted (given in bits 0-15).

SDL2 and SDL Interpreter Halts (L=@0000xx@)

@01@	Evaluation/Program Pointer Stack Overflow.
@02@	Control Stack Overflow.
@03@	Name/Value Stack Overflow.
@04@	Remapped area has insufficient length.
@05@	Invalid Parameter passed to a PROCEDURE.
@06@	Invalid Substring (SUBBIT or SUBSTR).
@07@	Invalid Subscript.
@08@	Invalid Value returned from a TYPED PROCEDURE.
@09@	Invalid CASE.
@0A@	Divide by Zero.
@0B@	Uninitialized reference variable.
@0C@	Read out of bounds or a memory parity error.
@0D@	Invalid operator.
@0E@	Evaluation/Data Stack overflow.
@0F@	CONVERT error.
@10@	Console Halt (INTERRUPT switch).
@11@	HALT Operator. The T Register contains a further definition of the halt. Complete information on MCP halts is given below.
@12@	Write out-of-bounds.
@13@	Exponent overflow.
@14@	Exponent underflow.
@15@	Expression out of range.
@16@	Superfluous exit.
@17@	Out of memory space.

@18@	Invalid link.
@19@	Program Pointer Stack overflow.
@1A@	Integer overflow.
@1B@	Message transfer data not present.
@1C@	Message transfer invalid data template.
@1E@	Invalid Parameter in DYNAMIC Declaration.
@1F@	Invalid TRANSLATE.
@20@	Invalid subprogram type.
@21@	Reference assignment length mismatch.
@22@	Invalid operand.
@23@	Multiply result is too large.
@24@	Evaluation Stack underflow.
@25@	Invalid SET member.
@26@	Invalid Communicate.
@27@	Program Pointer Stack underflow.
@28@	Reference to an invalid variant of a record.
@29@	Attempt to de-reference a null pointer.
@2A@	Reference to a disposed dynamic variable.
@2B@	Value out of range.
@2C@	Set out of range.
@2D@	File declared in a recursive routine.
@2E@	Illegal assignment to a FOR-LOOP index.
@2F@	Attempt to change a variant with the variant in use.
@30@	Attribute error.
@31@	Uninitialized data item.
@32@	Invalid record address.
@35@	B 1870/B 1860 Console Cassette Data Error
@37@	B 1870/B 1860 RWOAM detected.

Firmware Halts (L=@00F0xx@ OR @000Fxx@)

@02@	A CLEAR/START disk channel was specified in the X register, but the device on the specified channel is not a disk device (TE/TF=Device ID).
@03@	Control is not idle; that is, the control is not in status count 1 (T=Status Count).
@04@	Timeout while waiting for SERVICE REQUEST. Push START to retry.
@05@	Bad Reference Address (X=Good Reference Address, Y=Bad Reference Address, TE=Port, TF=Channel). Push START to use the good Reference Address and continue.
@06@	A control is in an erroneous Status Count following a SERVICE.REQUEST (TF=Channel).
@07@	A bad RESULT.DESCRIPTOR was received from a control: the OP.COMPLETE bit (bit 0) was reset (T=RESULT.DESCRIPTOR).
@08@	A SEEK TIMEOUT occurred. Push START to continue.
@0A@	A memory parity error was detected in I/O data. Push START to continue.

@0B@	A TIMEOUT occurred while waiting for OP.COMPLETE on a port device. Push START to retry.
@0C@	An I/O exception condition remained after 15 retries (T=RESULT.DESCRIPTOR). Push START to retry.
@0F@	No disk control found on the system.
@15@	A NAME TABLE entry is empty.
@17@	SYSTEM/DUMPFILE disk address is zero, and a dump was requested (DUMP option is probably reset).
@1E@	Checksum error. T = SOFTWARE.ID.NO (See Note below).
@22@	Cassette data error.
@26@	The NAME TABLE is in an incorrect format for this release of CLEAR/START.
@30@	TEXT input (B 1990 systems) is in error. Push START or enter correct text and push START.
@35@	Other than system disk on-line at CLEAR/START
@83@	A discardable segment of GISMO required by the system hardware or specific MCP options that are set is not present in the selected GISMO. Push START to ignore the non-present segment and continue.
@86@	Software compatibility problem. TE and TF=SOFTWARE.ID.NOs (See Note 1). If TD=1 then X=Level, Y=Level If TD=7 then X="NEEDS", Y="HAS".
@8B@	Pseudo MAXS too large (X=pseudo MAXS, Y=maximum value on the system). Push START to use value in Y.

NOTE

Software ID Numbers:

1 = System Initializer
2 = GISMO
3 = Micro MCP
4 = MCP
5 = SDL2 Interpreter
6 = CLEAR/START

GISMO Halts (L=@0D00xx@)

@10@	Console Halt (INTERRUPT switch).
@12@	MCP write out of bounds. X=LIMIT.REGISTER.
@20@	(RFAC option set) Bad Reference Address returned from a control (X=Good Reference Address, Y=Bad Reference Address, TA=Channel, TE/TF=Status Count). Push START to use good Reference Address.
@21@	(RFAC option set) Irrecoverable Reference Address error (same register settings as @0D0020@ halt).
@22@	(RFAC option set) Software attempted to send a Reference Address of zero to a control.
@24@	Unknown device id returned by a control (X=Reference Address, TB=Channel).

@27@	(Debug GISMO only) A pause op was sent to an uninitialized channel (X=Reference Address, TB=Channel).
@28@	(Debug GISMO only) PAUSE or SEEK.COMPLETE problem (X=Reference Address, TB=Channel).
@30@	INTERRUPT.QUEUE Overflow (X=number of messages attempted, Y=maximum entries permitted).
@31@	The dispatch (INCN) register is locked, indicating that a port device is hung. (TE=Port, TF=Channel, X=Reference Address of message attempting to be sent.)
@36@	Bad COMMUNICATE.WITH.GISMO verb (T=FA value when reading communicate).
@37@	Bad COMMUNICATE.WITH.GISMO adverb (X=Communicate function, T=FA value when reading Communicate).
@38@	COMMUNICATE.WITH.GISMO/GISMO.COMMUNICATE: Parameter list length error (T=FA address).
@39@	Bad GISMO.COMMUNICATE verb (X=verb).
@42@	A program attempted to use a deleted GISMO function (T=LIMIT.REGISTER, X=Function). Reloading the program's interpreter is warranted before pursuing the problem further.
@44@	The MCP dispatched an I/O operation with a result descriptor that was already in process.
@47@	The port device returned an illegal high-priority interrupt on a DISPATCH.READ micro-instruction (INCN register bit 1 set) (TE=Port, TF=Channel, X=Reference Address + 24).
@53@	Cassette Data error at entry to GISMO (Y=STATE.FLAGS, X=LIMIT.REGISTER).
@54@	CPU multiple bit parity error (T=ELOG register contents, Y=STATE.FLAGS, X=LIMIT.REGISTER).
@55@	Attempted to read or write outside the physical bounds of main memory. X=LIMIT.REGISTER, Y=STATE.FLAGS. If Y equal 0, read or write occurred while GISMO was running. If Y is not equal to 0, read or write occurred while the program with the LIMIT.REGISTER in X was running.
@60@	Service request received from a missing or ignored channel (TB = Channel).
@A0@	(Dual Processors only and TOUT option set) CPU timeout: The processor that halted detected that the other processor timed out due to either being halted or being in a micro-loop.
@A1@	(Dual Processors only) Invalid message sent from the slave processor.
@A2@	(Dual Processors only) Invalid message sent from the master processor.
@A3@	(Dual Processors only) Invalid GISMO request made by an interpreter running on the slave processor.
@A4@	(Dual Processors only) More unblock requests that block requests were sent to the slave processor.
@A7@	(Dual Processors only) A reset service request operation fails on the slave processor.

@A8@	(Dual Processors only and TOUT option set) Halt when a processor has detected that the other processor has halted with the @0D00A0@ halt.
@AA@	CONSOLE.INTERRUPT is true while waiting for response from a DCPU.DISPATCH.
@103@	Attempted to decrement RS.BLOCK.COUNT which was already zero.

Micro MCP Halts (L=@0200xx@)

@01@	There is a message in the Micro MCP INTERRUPT.QUEUE which indicates that a completed I/O is to be handled by Micro MCP, but the RESULT.DESCRIPTOR indicates that the I/O is not yet complete.
@02@	A message in the Micro MCP INTERRUPT.QUEUE for an I/O has an erroneous value in the IO.MCP.IO field.
@04@	A bad value for IO.MCP.IO was detected while examining an I/O descriptor.
@05@	While examining an I/O descriptor, the Micro MCP found that the hard or soft I/O complete bits (bits 0 or 1 of the IO.M.EVENTS field) were set, yet the IO.COMPLETE bit (bit 0 of the RESULT.DESCRIPTOR) was not set.
@06@	While examining an I/O descriptor, the Micro MCP found that the IO.COMPLETE bit (bit 0 of the RESULT.DESCRIPTOR) was set, yet the hard I/O complete bit (bit 0 of the IO.M.EVENTS) was not set.
	For halts @020001@ through @020006@: T=Reference address, Y=Result Descriptor, X bits 0-7=IO.M.EVENTS, X bits 8-23=IO.MCP.IO.
@07@	GISMO requested control of the processor, returning a result that the Micro MCP is unable to handle (the T register contains the result returned).
@08@	An I/O dispatch to GISMO returned a result that the dispatch was unsuccessful (the T register contains the result returned).
@09@	A communicate message was not within the Base-to-Limit space of the program doing the communicate.
@10@	The Micro MCP was requested to handle a communicate that it is not capable of handling.
@11@	Irrecoverable error in the Micro MCP. The T register contains the first six digits of the Micro MCP source sequence number where the halt occured.
@12@	Micro MCP CONDITIONAL.HALT. The T register contains the first six digits of the Micro MCP source sequence number where the halt occured.

@13@	On a delayed random I/O, the RESULT.DESCRIPTOR indicates that the I/O operation has been initiated, but the IO.MCP.IO field is in an improper state.
@20@	The HI.PRI routine of the Micro MCP was given control, yet no high-priority interrupt was found in the Micro MCP INTERRUPT.QUEUE.
@21@	A high-priority interrupt was found, but the IO.COMPLETE bit (bit 0 of the RESULT.DESCRIPTOR) was not set, indicating that the I/O was not yet complete.
@22@	A dispatch of a POCKET.SELECT operation through GISMO returned a result indicating that the dispatch was unsuccessful (T=Result returned).
@23@	A POCKET.COMPLETE or DOUBLE.DOCUMENT result was expected, but not obtained, from a POCKET.SELECT dispatch (T=Result returned).

MCP Halts (L=@000011@)

When the MCP executes an explicit HALT instruction, the L REGISTER is set to @000011@ and a parameter is loaded into the T REGISTER to further define the nature of the halt. Usually, this parameter is the first six digits of a sequence number in the MCP itself; however, some halt conditions occur at more than one place in the MCP. These are given a common identifier, as follows:

T Register	Reason
@111111@	No memory
@333333@	This MCP is missing patches. Push START to continue.
@444444@	HALT ODT input message was entered. Push START to continue.
@Cxxxxx@ @Dxxxxx@ @Exxxxx@ @Fxxxxx@	Disk I/O Error. Push START for Port, Channel, and Unit.
@000Cxx@	Systems Software Compatibility Error. The low-order eight bits of the T REGISTER contains two 4-bit numbers identifying the two programs that are incompatible, as follows: 1 System Initializer 2 GISMO 3 Micro MCP 4 MCP 5 SDL2 Interpreter

All other halts point to a specific sequence number in the MCP. The halts marked with an asterisk character (*) can be pushed through by pushing START. All other halts are irrecoverable; a memory dump should be taken and submitted with supporting documentation and a B 1000 Field Trouble Report.

T Register	Reason for Halt
@037870@	Attempt to initiate in-process I/O.
@037925@	DISPATCH to invalid Port or Channel.
@038000@	QLOCK.COUNT overflow.
@038020@	QLOCK.COUNT underflow.
@038615@	Got an INTERRUPT from the Micro MCP.
@038630@	Memory parity on dispatch (Interrupt from Channel 15).
@039438@	MCP attempted a disk I/O, but the port and channel are not for a disk unit.
@039439@ *	A disk I/O did not complete in 30 seconds. Push START once — T contains the result descriptor. Push START again — T contains the port, channel, and unit. Pushing START again causes the MCP to wait for 30 seconds more.
@039443@	Attempted I/O over memory link.
@040475@	MCP asked to retry a disk operation that was not complete with an I/O exception.
@040646@ *	Bad memory statistics (Non-release MCP only).
@040724@	Broken memory link.
@040770@	Attempt to overlay a buffer in use by the Master processor.
@040910@	Incorrect linkage found in queue structure.
@040918@	Incorrect item type in queue available structure.
@040924@	Bad backward link in queue available chain.
@040980@	Last overlay not on link boundary.
@041494@	Bad "pointer" field in memory link.
@043010@	Segment dictionary marked SAVE.
@043602@	A memory link which should have been marked SAVE was not so marked.
@044320@	Broken Memory Link.
@046045@	Could not open ODT queue.
@046060@	Could not find ODT_Q_FILE.
@046385@	Invalid interrupt for the MCP.
@046685@	Invalid interpreter-generated communicate.
@047741@	MCP fell out of the OUTER_LOOP.
@049169@	SYSTEM/ELOG disappeared from the system disk.
@049174@	Drive Transformation Table is incorrect.
@049545@ *	Integrity error on system disk found at CLEAR/START.
@049570@ *	Corrupted SYSTEMDUMP file fields in coldstart variables.
@050755@	Failed to absolutize GISMO or SDL Interpreter.
@051035@	Cannot find an IOAT for this system disk.
@051656@ *	ODT failed to respond to a test op. Push START for ODT port and channel. Push START again for the reference address.

T Register	Reason for Halt
@051722@	Tried to CM and CLEAR/START 12.0 software on an 11.0 system disk.
@051744@	The Coldstart Variables have been changed by this MCP; please CLEAR/START again.
@052300@	Invalid dispatch while attempting to rewind a tape unit at CLEAR/START.
@052592@	A control did not respond to a TEST OP after a 30-second wait (at CLEAR/START). Push START once — T contains port and channel. Push START again — T contains I/O Descriptor address.
@052640@	Too many datacomm port/channels on this system.
@053727@	Miscalculated required size of the IOAT during CLEAR/START.
@054268@	ODT memory initialization problem at CLEAR/START.
@054536@	Failed to find a system disk that CLEAR/START had already found once before.
@054971@	Unexpected Port Channel Unit found for disk drive.
@057727@	Invalid port channel unit found in quik disk array.
@058377@ *	Somehow lost DFH for SYSTEM DUMPFILE after directory update.
@058449@	Micro MCP segment fault improperly routed.
@062020@	Dispatch to invalid port or channel.
@062100@	Dispatch to invalid port or channel.
@062240@	MCP is lost during Punch Check Recovery.
@062760@	Dispatch to invalid Port or Channel.
@069470@	I/O Complete for ROLLOUT, but that task is not being rolled out.
@069740@	In IOCOMPLETE procedure, an I/O in question is not complete.
@070210@	Invalid IO.TYPE - 32.
@073042@	While looking for available space on a system disk, the MCP found the unit not to be a system disk.
@075950@	A dictionary is in memory, but its media bit is off.
@076790@	No memory for data overlays.
@077985@	Invalid offset into DFH dictionary.
@078562@	DFH dictionary improperly formatted.
@078883@	DFH dictionary improperly formatted.
@078893@	DFH dictionary improperly formatted.
@079024@ *	DFH dictionary improperly formatted.
@079122@	DFH dictionary improperly formatted.
@080610@ *	Bad value passed to HEADER.UPDATE.
@080129@	Invalid condition for data decks.
@080271@	Attempt to link in a DFH that is in directory already.
@080379@ *	DFH dictionary improperly formatted.
@080633@	Invalid condition for data decks.
@080873@ *	DFH size field does not match actual size.

T Register	Reason for Halt
@081770@	Power Down MPF failed.
@082806@ *	Log header changed while log file still open.
@085561@	An ISAM I/O was in process while updating buffers.
@085564@	Illegal attempt to re-use descriptor.
@088743@	MCP asked to handle file protection that should have been directed to the Micro MCP.
@088746@	MCP asked to handle file protection that should have been directed to the Micro MCP.
@090085@ *	MCP retrying an I/O for which there is no evidence of an error condition.
@090087@ *	MCP retrying an error for which there is no evidence of an error condition..
@091140@	An open pseudoreader file is not pointing at an existent pseudoreader.
@091160@	Invalid SMCP lock count.
@091673@	An attempt to split a fine table exposes a corrupt next available chain.
@101020@ *	I.S. Fine table links are invalid.
@103680@ *	I.S. Currents missing for task.
@111111@	No memory.
@112771@	Invalid queue address found.
@115200@ *	File not open condition not screened off by R_W_CALLER.
@115300@	Enhanced I/O not allowed.
@122512@	Illegal port in I/O descriptor.
@123481@ *	Tape control appears to be hung.
@126015@	Problem with skipping an empty area of a disk file.
@126095@	Call on GET.NEW.AREA with POSITION communicate is invalid.
@126480@	Could not update Base Pack header.
@126590@	Unrecognizable communicate called GET.NEW.AREA.
@128096@	Invalid BLOCKS_PER_AREA count.
@140450@	Bad call on OPEN_QUEUE.
@140460@	Bad call on OPEN_QUEUE.
@140499@	RIB number is invalid.
@140860@	Bad call on GET_QUEUE.MESSAGE.
@140870@	Bad call on GET_QUEUE_MESSAGE.
@140880@	Bad call on GET_QUEUE_MESSAGE.
@140890@	Bad call on GET_QUEUE.MESSAGE.
@140900@	Bad call on GET_QUEUE.MESSAGE.
@148390@	Tried to erroneously return non Q_disk to available.
@148477@	Problem returning Q_disk.
@153466@	Disk I/O error in usercode verification routines.
@154190@	No memory to verify security.
@154670@	Invalid usercode.
@158686@	Invalid parameter passed to usercode processing routines.

T Register	Reason for Halt
@158710@	Invalid usercode.
@159874@	Error in RIB list integrity.
@159966@	Bad call on GET_QUEUE_MESSAGE.
@159981@	Error in RIB list integrity.
@165430@	Cannot handle type INDIRECT in a Code Dictionary.
@173651@ *	During program initiation, attempted to bump the usercount in the interpreter file DFH - but the interpreter is already in the interpreter dictionary.
@173712@	During program initiation, attempted to assign a new interpreter to an invalid interpreter dictionary index.
@175110@ *	Lost track of number of users of a segment dictionary.
@176280@	PROG.SPAD.PTR not pointing to segment two of the PPB.
@179796@	Invalid RSN address
@179803@	Invalid VERB in WFL job task communicate.
@179818@	Parent job of a task has disappeared.
@180452@	IPC caller job has disappeared.
@181610@	Memory allocation for an RSN is incorrect in FIREPROG.
@181810@	Memory allocation for an ESN is incorrect in FIREPROG.
@183699@	Memory allocation for an ESN is incorrect in RESTART code.
@183720@	Memory allocation for an ESN is incorrect in RESTART code.
@184820@ *	A STOP Op was not completed. Push start once for the result descriptor. Push start again for port, channel, and unit.
@187167@	After the system disk had been squashed, insufficient memory to fixup addresses in the name table.
@188922@	RIB list corruption while handling a death_in_family.
@192877@	PARENT not in mix - illegal parent job number.
@192980@	Disk address in Task Variable Table equals zero.
@193284@	Lost track of a task's parent.
@193850@	No schedule entry for successor on unconditional execute.
@195280@	Q_KEY stored in QPTR is now bad.
@195484@	Tried to return a chunk of disk whose address equals zero.
@195525@	An RSN had a zero task_variable_table address.
@195748@ *	Problems when initiating task.
@195750@ *	Problems when initiating task.
@198107@	Invalid RSN address.
@198115@	Roll in failed.
@198610@	Q_KEY for ODT_QUEUE is blown.
@200691@	Database still open late in termination code.

T Register	Reason for Halt
@200860@	TERM_FINAL failed.
@201920@	Terminating a task that does not exist on disk.
@202350@	Terminating a task that does not exist on disk.
@208409@	Desired run structure does not exist.
@209180@	A page dictionary was illegally overlaid.
@210230@	Cannot find the file that we are currently using.
@210880@ *	SY_TYPE equals SYSTEM_DESC and SY_FILE on.
@211670@	Environment address destroyed in MOVE_ES_REMNANT.
@217980@	IO_MCP_IO on a user file in not equal to zero.
@220000@	In ROLLOUT for a frozen task.
@221710@	Could not find Pseudo Reader that was in use.
@226236@	Illegal parent job number for a task.
@226239@	Task points at another task's task_variable_table.
@226285@	Bad parameter to SCHED_OUT.
@227130@	No such task scheduled.
@227210@	Invalid key passed to CLOSE_QUEUE.
@227700@	Scheduled a task that does not exist on disk.
@232360@	Invalid MICR communicate.
@233567@ *	Corrupted IOAT_END field in HINTS.
@233905@ *	Corrupted IOAT_END field in HINTS.
@234627@	Can't find SYSTEM disk.
@238570@	Discovered bad pack label.
@245120@	I/O will not complete while trying to ready a disk.
@245440@	No IOAT for current disk unit (MAKE_DISK_ABSOLUTE).
@248140@	Cannot find MPF_INFO_TABLE already in use.
@249050@	Bad disk file header.
@250080@ *	Cannot find entry in MPF_TABLE.
@250230@	Cannot find MPF_INFO_TABLE already in use.
@256290@	Tried to remove tracks from a non-disk device.
@256942@	Bad disk PCU found in temporary table management.
@257080@	No disk available for temporary available table.
@257232@	A PCU of zero was found while putting a chunk of disk into the temporary available table.
@258005@	A chunk of disk with a PCU of zero was found in an available table.
@258150@	MCP was asked to find the temporary available table on a non-disk PCU.
@258858@	Attempted to permanently allocate disk on a RAM unit.
@261102@	Tried to return disk to an offline disk device.
@262770@	Trying to return disk already in the available table.
@262880@	Returning an invalid disk address (MSG SPOUTED).
@263140@	Returning non zero disk address with zero PCU.
@263330@	Returning non zero disk address with zero PCU.
@264842@	No disk to extend an available table.
@269930@	Returning non zero disk address with zero PCU.
@270289@ *	Invalid available table, addresses out of sequence. Push START to continue and run SYSTEM/PANDA to check disk.

T Register	Reason for Halt
@271820@	Bad entry found in temporary disk available table.
@289540@	Bad disk directory.
@290140@	Irrecoverable disk I/O error on file header read.
@291860@	No disk available for directory expansion.
@292020@	Irrecoverable disk I/O error on file header read.
@292260@	Disk directory has been corrupted.
@293894@	No IOAT for current disk unit.
@293952@ *	Problems while doing disk directory manipulation.
@296425@	SYSTEM/ODT remote file open denied - file missing.
@296430@	SYSTEM/ODT remote file open denied - file locked.
@296435@	SYSTEM/ODT remote file open denied - adapter missing/load failed.
@296440@	SYSTEM/ODT remote file open denied - MCS denied open.
@296445@	SYSTEM/ODT remote file open denied - too many remote files.
@296450@	SYSTEM/ODT remote file open denied - lsn missing.
@296455@	SYSTEM/ODT remote file open denied - too nested.
@296460@	Network controller run error detected.
@296465@	SYSTEM/ODT remote file open denied - too many stations.
@297310@ *	Illegal parameter passed to procedure SPOUT_INVALID.
@297605@	Insufficient system disk to open a queue file from the MCP to SYSTEM/ODT.
@298325@	Failure to find overlayable space to spout message.
@298931@	Invalid disk type found in the IOAT.
@300988@ *	SYSTEM/LOG or SYSTEM/ELOG has disappeared.
@301236@	No Disk for header for new log.
@301584@	Missing LOG file.
@302195@	Incorrect LOG_MIX_INFO for a task.
@302410@	Attempted to reallocate LOG_MIX_INFO for a task.
@303005@	No subport address for subport log entry.
@305665@	Failed to QUEUE a message for AUTOBACKUP.
@305715@	Failed Receiving Msg from QUEUE for AUTOBACKUP.
@305735@	Failed Receiving Msg from QUEUE for AUTOBACKUP.
@305740@	Failed receiving msg from QUEUE for AUTOBACKUP.
@305745@	Failed Receiving Msg from QUEUE for AUTOBACKUP.
@305760@	Failed closing queue for AUTOBACKUP.
@310760@	Port file is open but subport-attributes disk space is not assigned.
@313350@	Exceeded subport index while looking for change event.
@328980@	SYSTEM/DUMPFILE not large enough for DM command.
@329383@ *	Attempting to dump system state and either SYSDUMP designation not online, DMPL option is set, or pack has never been clear/started.
@332009@	Invalid usercode for SORT.
@332014@	A scheduled SORT vanished from the schedule.

T Register	Reason for Halt
@333333@ *	This MCP is missing patches.
@344907@	The program which called a SORT has disappeared.
@349240@	An I/O did not complete after a 30-second wait in the IO.ERROR routine. Push START once — T contains I/O descriptor address. Push START again — T shows whether OP was complete.
@349412@	Attempt to initiate in-process I/O (non-release MCP).
@349413@	DISPATCH to invalid port or channel.
@357803@	Unexpected port/channel/unit found for disk drive
@384440@	Dispatch to an invalid port or channel.
@387880@	FIB indicates partial block but block count = 0.
@401510@	Tape I/O did not complete after a 30-second wait. Push START once — T contains I/O Descriptor address. Push START again — T shows result descriptor field.
@407733@ *	The PAN Name Table Entry is empty.
@408020@	Read of a disk pack label failed to complete in thirty seconds.
@408657@	Invalid SYSTEM pack info.
@411760@	Non-card device in CARD_STATUS.
@414238@ *	Possible disk chain problem in quik-disk.
@419600@	Tape I/O did not complete after a 30-second wait. Push START once — T contains I/O Descriptor address. Push START again — T shows result descriptor field.
@443180@	Bad I/O reading interpreter into memory.
@444444@ *	HALT ODT command was entered.
@445690@	Cannot find translate file that was already in use.
@452000@	No space allocated for ANSI.BUFFER.SPACE.
@475791@	No IOAT for current disk unit.
@476140@	Invalid reason for hanging a program.
@477340@	Invalid reason for hanging a program.
@477690@ *	Problem returning disk to available tables.
@478420@	Cannot find TRANSLATE file that was already in use.
@482926@ *	FIB and FPB for an open file differ in PROTECTION.
@483324@	DFH management problem (non-release MCP only).
@483331@	Disk file header management problem..
@484427@ *	Unexpected value returned from FILE_BUFFER (non-release MCP only).
@486720@	Missing file header for a multipack file.
@487610@	Cannot find pack that is already in use.
@493110@	Verify usercode failed when OPEN.SET.OVERRIDE.
@493571@	Mismanagement in processor scheduling.
@514910@	Cannot find translate file that was already in use.
@521700@	Pseudo Reader links are invalid.
@535560@	Queue not a queue or not a disk queue.
@535620@	Cannot find disk.
@536460@	Invalid parameters passed to OPEN_QUEUE.
@537010@	Invalid parameters passed to CLOSE_QUEUE.
@537920@	No multiline for remote open for SYSTEM/ODT.
@538070@	Invalid parameters passed to PUT_QUEUE_MESSAGE.

T Register	Reason for Halt
@540430@	Bad call on OPEN_QUEUE.
@543300@	Device is not a data recorder.
@545220@	Attempted to open a data recorder other than input or output.
@545720@	Attempted to open a data recorder other than input or output.
@548480@	Invalid parameters passed to PUT_QUEUE_MESSAGE.
@554222@	I/O chain corrupted.
@554590@	Invalid parameters passed to CLOSE_QUEUE.
@555861@	READER/SORTER open file count is corrupted.
@559642@ *	IOAT job number is not equal to current RSN job number when closing a file.
@563630@	Could not power down Continuation Pack.
@563810@	Cannot find Base Pack.
@564710@ *	Lost a Disk File Header for a Pseudo Reader.
@564930@	MPF_TABLE has been destroyed.
@566822@ *	RETURN_DISK failure when closing a disk file.
@574664@	Queue management problem.
@575180@	Invalid parameters passed to PUT_QUEUE_MESSAGE.
@575331@	Invalid parameters passed to CLOSE_QUEUE.
@575360@	Invalid parameters passed to CLOSE_QUEUE.
@576120@	CLOSE_QUEUE invalid queue address.
@576200@	CLOSE_QUEUE invalid queue address.
@577281@	Invalid parameters passed to PUT_QUEUE_MESSAGE.
@577940@	Invalid parameter returned from PUT_QUEUE_MESSAGE.
@578000@	Invalid parameter passed to CLOSE_QUEUE.
@578020@	Invalid parameter passed to CLOSE_QUEUE.
@578209@	Illegal parent job number - parent not in mix.
@585270@ *	ISAM Subfile File Security violation.
@586600@ *	ISAM subfile missing for HANG_PROGRAM_UP.
@586690@ *	ISAM Subfile missing for HANG_PROGRAM_UP.
@592820@ *	ISAM Close Remove is missing a file.
@592970@ *	ISAM global file disappeared.
@593590@	Mismanagement of ISAM number of users.
@593994@ *	ISAM disk I/O not complete or an exception occurred. Push start for result descriptor. Push start again for port, channel and unit.
@596230@	Begin address of I/O higher than MCP limit register.
@596280@	Dispatch to invalid Port or Channel.
@600670@	Failed to deliver an ENABLE_QUEUE message.
@601020@	PUT_QUEUE_MESSAGE failed or bad parameters passed.
@601550@	Failed to deliver a DISABLE_QUEUE message.
@602340@	PUT_QUEUE_MESSAGE failed.
@604100@	PUT_QUEUE_MESSAGE failed or bad parameters passed.
@604420@	PUT_QUEUE_MESSAGE failed or bad parameters passed.
@605170@	Invalid queue address passed to CLOSE_QUEUE.

T Register	Reason for Halt
@605230@ *	GET_QUEUE_MESSAGE failed - empty queue.
@605260@	GET_QUEUE_MESSAGE failed.
@605270@	GET_QUEUE_MESSAGE failed.
@605280@	GET_QUEUE_MESSAGE failed.
@605290@	GET_QUEUE_MESSAGE failed.
@606930@	Failed to deliver a queue message.
@607940@	PUT_QUEUE_MESSAGE bad parameters passed.
@608010@	RECEIVE did not RETURN.
@611600@	Could not find an LSN that should be present.
@615485@	Bad linkage in queue available buffer chain.
@616210@	Attempt clean-up of queue message not in-process.
@617320@	I/O Descriptor not complete.
@618050@	No message found.
@619830@	No message found.
@624770@	Queue memory link data structure broken.
@625060@	Queue must be empty here.
@625537@	RETURN_DISK problem when closing a queue file.
@625634@	RETURN_DISK problem while closing a queue file.
@625730@	Queue family descriptor is found to be corrupted when attempting to close queue file.
@625841@	RETURN_DISK problem after opening a queue.
@625853@	RETURN_DISK problem while closing a queue file family.
@629100@	Bad FIB or FPB address while opening a queue file family.
@629145@	Unable to successfully open a member of a queue file family.
@629148@	Unable to successfully open a member of a queue file family.
@630390@	Queue FIB not in memory.
@631030@	Invalid return from CLOSE_QUEUE.
@631880@	Invalid parameters passed to OPEN_QUEUE.
@634500@	Attempted to handle enable/disable reply with no network controller.
@634530@	Attempted to handle enable/disable reply for a non-present remote FIB.
@635360@	No memory to add station.
@635980@	Queue close problems while firing a new controller.
@638500@	Invalid parameters passed to PUT_QUEUE_MESSAGE.
@639030@	Invalid parameters passed to PUT_QUEUE_MESSAGE.
@639690@	Invalid parameters passed to PUT_QUEUE_MESSAGE.
@640380@	Invalid value returned from PUT_QUEUE_MESSAGE.
@643920@	Unexpected return from PUT_QUEUE_MESSAGE.
@643930@	Unexpected return from PUT_QUEUE_MESSAGE.
@644630@	Bad call on OPEN_QUEUE.
@644650@	Bad call on OPEN_QUEUE.
@692560@	Port I/O request with no FIB.
@699370@	Invalid parameters passed to OPEN_QUEUE.
@699490@	Invalid parameters passed to OPEN_QUEUE.

T Register	Reason for Halt
@707430@	Invalid parameter returned form PUT_QUEUE_MESSAGE.
@707540@	BNALIO with no FIB.
@711800@	GET_QUEUE_MESSAGE problem.
@711820@	GET_QUEUE_MESSAGE problem.
@711830@	GET_QUEUE_MESSAGE problem.
@718732@	Parameter passed to SEARCH_EQUALS was not 30 characters in length.
@719205@	Parameter passed to SEARCH_EQUALS_TASK_SYNTAX was not 30 characters in length.
@724880@	Could not successfully enqueue an OBJ statement.
@724890@	Could not successfully enqueue an OBJ statement.
@727830@	IPC Caller no longer in the mix.
@744640@	Prior task no longer in the mix.
@750409@	Default job queue disappeared.
@754510@	Invalid parameter passed to CLOSE_QUEUE.
@754590@	Bad call on CLOSE_QUEUE.
@756875@	Failed receiving message from QUEUE for AB.
@756880@	Failed receiving message from QUEUE for AB.
@756905@	Failed closing queue for AB.
@757015@ *	MCP exited AB with AB = 0.
@758880@	Cannot find task that zipped "AT" message.
@759000@	FIND_UNIT failed to find a device.
@759645@	Incorrect call on OPEN_QUEUE.
@759650@	Incorrect call on OPEN_QUEUE.
@759960@	Incorrect call on PUT_QUEUE_MESSAGE.
@759965@	Incorrect call on PUT_QUEUE_MESSAGE.
@774313@	Disk error rate management problems.
@779132@	In IL, DMS environment running for a non-DMS job.
@779225@	RSN.RS_FILE exceeds number of files.
@779295@	RSN.RS_FILE exceeds number of files.
@779558@	Illegal parent job number - parent not in mix.
@798595@	RSN.RS_FILE exceeds number of files.
@798600@	SYSTEM permitted OU on a non-database job and expected to find a database.
@808025@	Invalid USERCODE in PV.
@808065@	Invalid usercode in PV.
@808110@	Invalid usercode in PV.
@815355@	Bad Pseudo Reader chain.
@820330@	No disk available for available table.
@827492@	WFL failed to be scheduled upon an MCP request to run.
@827553@	A command to WFL could not be successfully enqueued.
@827554@	Invalid WFL job number in HINTS.
@834850@	ODT or ODX name table entry is empty.
@835146@ *	Corrupted message sent to CONTROL_CARD_DRIVER.
@835245@	SEARCH_EQUALS failed in TH.
@851160@	WFL restart file has disappeared from WFL restart table while doing a checkpoint.
@851175@ *	Tried to take dump with tasks still active.

T Register	Reason for Halt
@852620@	Active task not in mix or schedule.
@854077@	Overflowed a task variable.
@856910@	Disk address in Task Variable Table equals zero.
@857000@	Task Number in Communicate does not match Task Number on disk.
@857420@	Disk address in Task Variable Table equals zero.
@872260@	Job Task not in mix.
@872480@	Disk address in Task Number Table equals zero.
@872510@	Query of active subtask.
@872550@	Invalid mix number in task variable table.
@872570@	Task number in communicate does not match the task variable that was found in the task variable table.
@872690@	Task number in communicate does not match the task variable that was found by tasking routines.
@874170@	Invalid mix number in task variable table.
@874530@	Disk address in Task Variable Table equals zero.
@875779@	Bad parameter to AX.
@876040@	Disk address in Task Variable Table equals zero.
@876042@	Task Number in Communicate does not match Task Number on disk.
@876077@ *	Invalid disk address for task parameters.
@876087@	Problem getting space for asynchronous task parameters.
@878105@	Invalid VERB in WFL job task communicate.
@878502@ *	Bad title in WFL-generated deck.
@878505@ *	Bad title in WFL-generated data deck.
@878870@	Task number read from disk does not match current task number.
@880430@	WFL job had a null task_variable address
@907406@	When copying the code dictionary for the accessroutines of a DMS job closing a data base, an impossible condition was found.
@907420@	When writing the page dictionary for the accessroutines of a DMS job closing a data base, the job was found to be rolled out.
@907460@	When writing the page dictionary for the accessroutines of a DMS job closing a data base, corruption was found in the ESN or code dictionary.
@913080@	Zero port-channel on a DMS I/O.
@913100@	Bad unit hardware on a DMS I/O.
@913710@	Incomplete DMS write.
@913720@	Incomplete DMS write with exception.
@914520@	Incomplete DMS read.
@914530@	Incomplete DMS read with exception.
@916784@	When opening a DMS data base for its first user, there is no space in the audit buffer for the data base-open audit entry.

T Register	Reason for Halt
@917442@	An open or close of a DMS audit file was attempted for a non-DMS job.
@919290@	When opening a new area for a DMS audit file, the blocks-per-area count was greater than one.
@921132@	Although the DMS audit file status is OK, the audit file is not open.
@923490@	There has been a failure when copying the code dictionary for a DMS job closing a data base.
@923950@	When closing a DMS data base the DMS globals were missing from the DMS globals chain.
@924200@	There was a failure in closing the DMS environment of a job doing a data base close.
@924510@	When aborting a DMS job during data base open an impossible condition was encountered.
@924830@	No data base globals are allocated for an aborting DMS job with an incompletely open data base.
@926730@	Bad memory link encountered when releasing a DMS buffer.
@927363@	A DMS FATALERROR occurred on a data base that was audited to tape.
@927878@	When closing a DMS data base due to a FATALERROR, the disk audit file could not be closed.
@931140@ *	The DMS accessroutines gave a bad update-header communicate.
@941905@	A data inconsistency has occurred during DMS deadlock analysis.
@944761@	No user environment exists for a job opening a DMS data base.
@946250@	No disk file header exists in memory for an updated DMS datafile being closed.
@953580@	When binding DMS DASDL-generated code into the accessroutines at data base open, corruption was found in memory or the dictionary.
@972620@	Tried to switch to a non-existent environment.
@981840@ *	Corrupted count for interpreter.
@981940@	Invalid slot in interpreter dictionary given to the CLEANUP procedure.
@983330@	Interpreter file is somehow gone when trying to deallocate it.

Coldstart Tape Halts

When the COLDSTART/TAPE program halts, the L register is set to @000011@ and the T register contains the halt code. The following is a list of coldstart halt codes and their descriptions. On B 1990 systems, type GO and push the TRANSMIT key whenever the following instructions say to press the START button.

Halt Code	Description
@0C0001@	Disk I/O error. Press START button once to get result descriptor.
@0C0002@	Tape I/O error. Press START button once to get result descriptor.
@0C0003@	Unexpected data or result descriptor from Tape I/O.
@0C0004@	No tape control on system.
@0C0005@	No disk control on system.
@0C0006@	Disk not initialized in correct format.
@0C0007@	Trying to coldstart User pack.
@0C0008@	Missing SYSTEM tape. Make available and press START button.
@0C0009@	Missing required files from tape. Press START button until @0C0009@ is displayed again to obtain list of missing file numbers: 1 = MCPII 2 = SDL2/INTERP3M 3 = GISMO3 4 = SYSTEM/INIT 5 = MCPII/MICRO-MCP 6 = SYSTEM/COPY 7 = SDL2INTRIN/AGGREGATE 8 = SYSTEM/ODT 9 = SYSTEM/CONTROLLER A = SYSTEM/PANDA B = GISMO2
@0C000A@	Missing device on I/O dispatch.
@0C000B@	Insufficient disk for coldstart. Probably a bad Available or Master Available Table.
@0C000C@	Went beyond tape mark for a specific file. Try COLDSTART again. If it fails again, a corrupted SYSTEM tape is indicated.
@0C000D@	Missing tape mark.
@0C000E@	Invalid Tape HDR2 record.
@AAAAAA@	Cold start operation successfully completed. CLEAR/START required.

Refer to the *B 1000 Systems System Operation Guide, Volume 2*, for a description of the COLDSTART/TAPE program and the COLDSTART/DISK program

APPENDIX A
MCP MEMORY MANAGEMENT

The B 1000 computer systems were designed to cover a broad range of the computer market. In order to cover this range with a single operating system, it was necessary to implement virtual storage capabilities and apply the same techniques used for normal-state programs to the operating system itself.

The main memory requirements for any computer system are highly dependent on applications and operating procedures. This fact is even more true for a variable-length segment, virtual storage system such as the B 1000, which dynamically allocates memory to user programs as it is required. Such a system is able to keep many more programs in memory in order to provide higher processor utilization than are non-virtual systems or virtual machines with fixed page sizes (partitions). Since program segments are loaded only as needed, the memory requirements for programs on a machine such as the B 1000 (and the A Series/B 7000/B 6000/B 5000 systems as well) must be stated in terms of a working set, rather than either total program size or minimum memory required to run.

The working set for a program is that amount of memory that it most often needs during its execution to operate efficiently. This working set must also include the memory required for the functions requested of the operating system by the program, as well as certain operating system functions required for overall system control. The working set for the system as a whole is simply the sum of the working sets for all programs that are executed concurrently. If a program (or the system) is allocated less memory than its working set, it demands non-present segments at a rate that causes excessive segment overlaying and reduced efficiency. When the performance of the system degrades appreciably due to memory restrictions, the phenomenon is known as thrashing.

Concepts and Definitions

Familiarity with certain basic concepts of memory management, including memory fragmentation, working set, and thrashing, is necessary for an understanding of the Memory Management System provided by the B 1000 MCP.

Memory Fragmentation

Memory fragmentation is the failure to allocate all of memory for useful purposes. Two varieties of memory fragmentation, internal and external, can occur. The type of memory fragmentation that occurs depends, respectively, on whether a system uses a paging or a segmentation mechanism for memory management.

In a paging system, all of memory is divided into equal-sized pages or partitions. Therefore, 100% of memory is assigned to usable pages, and external fragmentation does not occur. Since memory requests typically are of varying sizes, the last page assigned to a memory request is usually not full. This is internal fragmentation.

In a system based on segmentation, segment sizes are variable, so that only enough memory to satisfy a request is allocated for a program. Therefore, no internal fragmentation exists in such a system. Some memory is required as overhead for a memory link to describe each segment, however. A more serious problem is that an area of memory too small for use may become available between two segments of memory being used. This is external fragmentation.

Neither paging nor segmentation is clearly superior to the other. Each has its advantages and disadvantages. The primary advantage of paging is that it is easier for the operating system to handle. Segmentation, on the other hand, provides a much more reasonable structuring of memory, since only the space logically required for a given function is allocated to that request. Programmers need not be concerned with trying to structure their memory requirements into requests that are exact multiples of the page size of the system, allowing them to concentrate on completion of their primary tasks instead of having to think about unnecessary details. Segmentation does however, cause geography problems for the operating system, because external fragmentation checkerboards memory.

Burroughs has traditionally opted to use segmentation in its approach to memory management, and the B 1000 systems are no exception to this rule. Therefore, memory management on B 1000 systems is concerned with the algorithms and problems of segmentation.

Working Set

The term working set refers to the set of all program segments which are accessed during a specific time interval (of arbitrary length). The working set for a specific program is the set of data (the Run Structure), files, and code segments which it uses during such a time interval, plus the memory requirements of the operating system necessary to perform program-requested functions (READ, WRITE, OPEN, and CLOSE, for example). The working set for the entire system is the sum of the working sets of all currently active programs. The working set for a program, and especially for the system as a whole, can and often does change drastically over successive time intervals as tasks go from one phase of execution to another.

Thrashing

Thrashing is the condition that exists when the working set for a program or set of programs does not fit in real memory. Specifically, in order to bring in the next code segment for a program, the operating system has to overlay a currently active code segment. Then that segment has to be brought back in, and another active segment must be overlayed, and so forth.

One of the most serious problems confronting virtual storage systems is thrashing. As the amount of memory available for a constant programming task is reduced, the amount of degradation due to thrashing normally appears very gradual at first. As the available memory is further limited (by introducing additional programs into the system, opening files, requesting additional or larger code segments, and so forth), a point is reached where the degradation due to overlays increases rapidly. This is the point where the procedures in the working set no longer fit in memory and are competing for space. This point, referred to as the thrashing point, is shown graphically in figure A-1.

System performance suffers drastically when thrashing occurs. Throughput degradation of 100% and over is not unusual in such instances. In fact, in the worst case, absolutely nothing gets done except overlays.

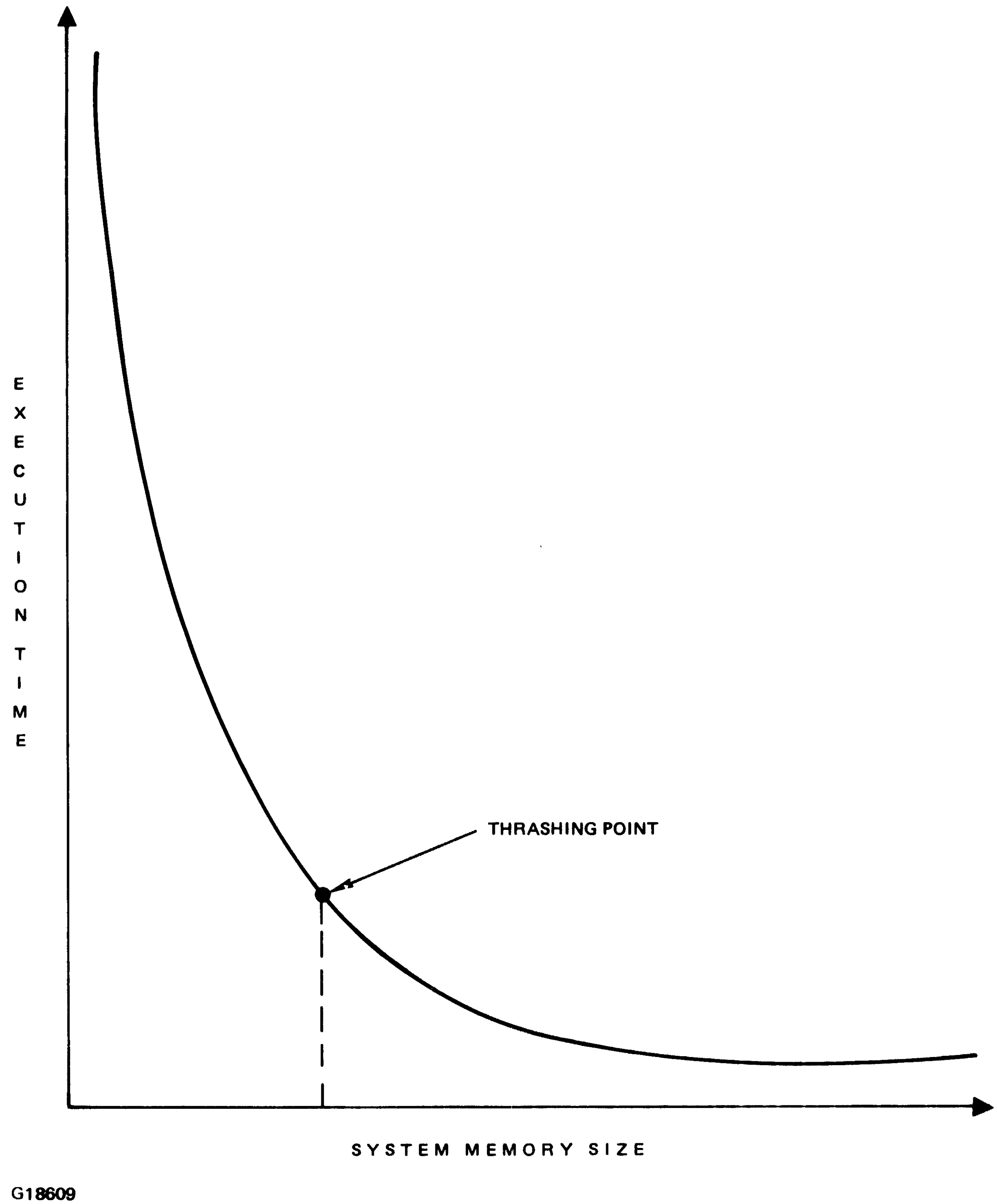


Figure A-1. Thrashing Point

B 1000 Memory Management Algorithms

No single memory management system is ideal for all situations. Consequently, the B 1000 operating system handles memory management with three separate levels of sophistication, using two different algorithms, in order to minimize the impact of more complex memory management schemes on those installations that do not need or want it. Installations that are satisfied with lower levels of the memory management system need not be concerned with the details of higher levels. This approach also allows users to ease into the more complex aspects of the memory management system smoothly, without being forced into an all-or-nothing decision.

Level One (Second-Chance)

The algorithm of Level One is basically a round robin (first-in, first-out) memory management scheme. When available memory space large enough to fulfill a request cannot be found by the operating system, one or more segments of in-use memory must be deallocated (overlayed). Overlayable memory is allocated starting from a left-off pointer which is then updated to point to the next lower segment in memory. Thus, the left-off pointer sweeps from high to low memory addresses until it reaches the first memory link, at which time it starts over again from the last memory link.

Each memory space has a touch bit that is set each time that memory space is accessed. As overlayable space is searched, if a touch bit is set, then the touch bit is reset and the search continues. Thus, the space is given a "second chance" to stay in memory. If an overlayable space is found that does not have the touch bit set, then that space is used. The use of the touch bit allows code segments that are frequently used to stay in memory, overlaying those code segments that are not in use.

Save memory space, which cannot be reassigned until explicitly returned by the program to which it is assigned (for example, FIBs and file buffers), is allocated toward the high end of memory so that it will tend to be pushed together, thereby reducing the external fragmentation that such save space inherently creates.

Level One Advantages

External fragmentation of memory is minimized, since small available chunks of memory tend to be swept up and used as the left-off pointer sweeps through memory.

Although a simplistic decision about what segment to deallocate is made, this decision can be made quickly. This is a very important feature, because if enough memory is available to contain the working sets of the currently active programs, then the first priority of the memory management system is to get that working set in as quickly as possible.

Level One Disadvantages

The most serious flaw of Level One is that there is no straightforward method by which a system user or operator can determine when memory has been overcommitted, which causes thrashing.

The priority of a program using a segment is not considered when deciding to overlay that segment. Therefore, code segments of high-priority tasks are not protected from being overlayed by segments of lower-priority tasks. High-priority data communication tasks are prime examples of programs which often suffer because their segments are not protected from background tasks, and are thus equally vulnerable to being overlayed.

Level Two (First-In, First-Out With Thrashing Detection)

The second level of the memory management system implements detection for the thrashing condition. The same mechanism for determination of what segment to overlay (the victim selector) is used for Level Two as for Level One. Thrashing detection is invoked following the next CLEAR/START operation by setting the THR option, when SYSTEM/INIT incorporates the thrashing detection code into GISMO. When GISMO, which is monitoring overlay activity, determines that thrashing is occurring and that it is not a temporary phenomenon, the operating system is notified. The operating system then performs the following two functions:

1. Stops more programs from being automatically started. This can be overridden by the system operator by using the JS system command to prod the schedule. Otherwise, the schedule is not automatically restarted until a program goes to end of job.
2. Sends the following message to the ODT:

   SYSTEM IS THRASHING, SCHEDULE STOPPED

   This message can be repeated either every time a program enters or leaves the MIX, or at every N.SECOND interval, as long as thrashing continues, depending upon the setting of the THRASH option of the MM system command.

When the system is shifting from one working set to another (as programs go to beginning of job or end of job, open or close files, or move from one phase of execution to another), memory is often overcommitted for a short period of time. This condition is acceptable if it does not persist for too long. One installation may, however, be willing to tolerate an overcommittment of memory for longer time intervals than another. For this reason, the THRASHING.SENSITIVITY option of the MM system command provides a means to adjust the sensitivity of the thrashing detection mechanism of the memory management system.

In addition, the maximum overlay rate that can be tolerated is highly dependent upon the speed of the disk from which the overlays are being done, since more overlays can be performed efficiently during a fixed time interval from fast disk than from a slow disk. For this reason the OVERLAY.RATE option of the MM system command provides a means to adjust this maximum allowable value.

The recommended value for the OVERLAY.RATE has been determined for the various disk types using their average access times (allowing for fixed operating system overhead required to obtain memory space and initiate the disk read) as shown in the following table:

Disk Type	Average Access	OVERLAY.RATE
B 9480 cartridge	80 ms	6
B 9481 cartridge	100 ms	5
B 9482 cartridge	55 ms	7
B 9484 pack	33.5 ms	10
B 9499 pack	42.5 ms	8
B 9371 head-per-track	20 ms	12
B 9371 head-per-track	40 ms	8
B 9470 head-per-track	5 ms	15

The default value for OVERLAY.RATE assigned by the operating system following a coldstart operation is 10.

Level Two Advantages

The advantage of Level Two is that system users and operators are aware of when memory is overcommitted and are, therefore, able to do a much better task of maintaining a mix of programs which utilizes most of memory but does not cause thrashing to occur.

Level Two Disadvantages

The only disadvantage of Level Two is that approximately 140 more bytes of non-overlayable memory are required beyond that of the Level One mechanism.

Level Three (Memory Priority With Thrashing Detection)

Level Three of the memory management system includes the thrashing detection of Level Two, but has a different victim (i.e. overlay candidate) selector based on task priority and segment usage. The Priority Memory Management algorithm is invoked following the next CLEAR/START operation by setting the MPRI option when the SYSTEM/INIT program incorporates the new victim selector code into GISMO.

In this level, requests for segments of memory are assigned priorities which are separate and distinct from processor usage priorities (refer to the MEMORY.PRIORITY control instruction attribute and the MP system command in section 2). No request for memory can cause a segment having a higher memory priority to be overlayed.

In a mix of programs having varying memory priorities, segments of high priority tasks actively in use are protected from segments of lower priority tasks. At fixed time intervals (known as the SAMPLING.INTERVAL) GISMO sweeps through all memory links on the system and examines a usage bit in each. This bit is set by the interpreter of the program when the code segment is accessed (that is, code in the segment is executed). If a segment has not been accessed since the previous sweep through memory, its priority is lowered by GISMO to the next lower memory priority active on the system. The segment is then protected at that priority for another SAMPLING.INTERVAL. If a segment is accessed at any time before being overlayed, it is restored to its original memory priority. In this way, segments of high-priority tasks are protected from those of low-priority tasks, and unused segments of any task tend to degrade to lower priorities and get overlayed.

In a flat mix (that is, a mix of programs having equal memory priorities), segments actively in use tend to stay in memory, while segments no longer being used tend to be overlayed. This cannot be made an absolute policy in a memory management scheme based on segmentation due to geography problems. For example, a very small inactive segment which has been allocated between two active segments may remain in memory longer than it otherwise would, because of its location. A flat mix has the additional advantage that it approaches the simplicity and efficiency of the Level Two algorithm as the system approaches thrashing. In general, however, optimal performance of level three memory management has been found to occur when at most three discrete memory priorities are used on the system.

The MCP sets the SAMPLING.INTERVAL value based upon the system memory size, as shown in the following table:

Memory Size	SAMPLING.INTERVAL Value
0- 261 KB	8 (0.8 seconds)
262- 523 KB	10 (1.0 seconds)
524- 785 KB	12 (1.2 seconds)
786-1047 KB	14 (1.4 seconds)
1048-1309 KB	16 (1.6 seconds)
1310-1571 KB	18 (1.8 seconds)
1572-1833 KB	20 (2.0 seconds)
1834-2095 KB	22 (2.2 seconds)

The SAMPLING.INTERVAL option of the MM system command provides a means to change the rate at which the GISMO sweeper is executed, although changes from the default value should not be necessary and are not recommended.

Level Three Advantages

Varying memory priorities protect active segments of higher-priority tasks from being overlayed by those of lower-priority tasks.

As in Level Two, the system operator is aware of when memory is overcommitted and can do a much better job of maintaining a mix of programs which utilizes most of memory but does not cause thrashing to occur.

Running with equal memory priorities tends to make the system run in a manner approaching that of Level Two. However, the added advantage is that unused segments degrade in priority and tend to be overlayed, while active segments tend to stay in memory.

Level Three Disadvantages

Approximately 170 more bytes of non-overlayable memory are required beyond that of the Level Two mechanism.

If tasks are run at varying memory priorities, external fragmentation of memory can be increased.

Extended Segment Decay

Level Three of the memory management system also allows protection of specified segments from overlay by lower-priority segments for an extended period of time (greater than the SAMPLING.INTERVAL) after they were last accessed. This capability is designed primarily to aid data communication installations which have no way of insuring that key segments of network controllers and other remote applications remain in memory. This problem can result in poor response time when low-priority batch or background tasks cause critical data communication program segments to be overlayed. It is not advisable to permit such important segments to be marked save (non-overlayable). However, Extended Segment Decay is only a little short of that capability.

There are two aspects to protecting key program segments:

1. Those segments which are to be protected for an extended period of time must be identified and marked. The means for accomplishing this is a utility program called SYSTEM/MARK-SEGS.
2. The length of time such segments are to be retained must be specified. This is done by setting the program attribute SECONDS.BEFORE.DECAY to some value between 0 and 600, inclusive (refer to the SECONDS.BEFORE.DECAY control instruction attribute in Section 2).

The priority of segments which have been marked as important is not degraded until and unless those segments are not accessed for the number of seconds specified by the SECONDS.BEFORE.DECAY attribute. If SECONDS.BEFORE.DECAY is set to zero for a particular program, then all of its code segments (both those marked as important and unimportant) are treated as unimportant. Furthermore, SECONDS.BEFORE.DECAY is completely subserviant to memory priority. A segment with a higher memory priority can overlay a segment with a lower priority no matter what the value of SECONDS.BEFORE.DECAY for the lower-priority task. SECONDS.BEFORE.DECAY only determines how long after a segment was last accessed it is able to retain a given priority.

Specifying a SECONDS.BEFORE.DECAY value for a program that has no segments marked as important by SYSTEM/MARK-SEGS has no effect.

Extended Segment Decay Advantages

Extended Segment Decay allows data communication users to guarantee that key segments of network controllers and other programs are not overlayed by lower-priority tasks for any fixed period of time (between 0 and 600 seconds) after they are last accessed.

Extended Segment Decay Disadvantages

Users of Extended Segment Decay can lock up more memory than they really need, and thereby degrade the performance of background tasks more than necessary.

Functional Characteristics

The thrashing detection and priority memory management are the functional characteristics described in the following paragraghs.

Thrashing Detection

The following paragraphs describe the functional charactistics of thrashing detection used by the B 1000 operating system.

SAMPLING.INTERVAL
: A value (in tenths of seconds) computed by the operating system from the B 1000 system memory size which specifies how often GISMO checks to determine whether thrashing is occurring. This value also specifies how often the GISMO sweeper is executed if the MPRI option is set.

OVERLAY.TARGET
: The value (in number of overlays per SAMPLING.INTERVAL) computed by the operating system from the specified OVERLAY.RATE and the SAMPLING.INTERVAL.

MAX.SWEEP.INTERVAL
: A value (in tenths of seconds) computed by the operating system from the THRASHING.SENSITIVITY specified, equal to one-third of the value of THRASHING.SENSITIVITY. If the MPRI option is set, MAX.SWEEP.INTERVAL specifies how often the sweeper is executed once GISMO determines that the OVERLAY.RATE has been exceeded.

OVERLAY.COUNTER
: A count of the number of overlays that have occurred. The count is reset to zero at the end of each SAMPLING.INTERVAL.

SAMPLING.CLOCK
: A field that is incremented at each TIMER INTERRUPT until it reaches the value of the SAMPLING.INTERVAL.

MEM.EXTEND.CLOCK
: A field that is incremented by the SAMPLING.CLOCK at the end of each SAMPLING.INTERVAL (if the OVERLAY.COUNTER exceeds the OVERLAY.TARGET) until it reaches the value of the MAX.SWEEP.INTERVAL.

MEM.EXTEND.COUNT
: A counter that is bumped each time the MEM.EXTEND.CLOCK exceeds the value of MAX.SWEEP.INTERVAL. If this counter reaches a value of 3, thrashing has continued for the length of time specified by THRASHING.SENSITIVITY, and GISMO notifies the MCP of this condition.

References to the sweeper are applicable only if the MPRI option is set (refer to the following paragraphs on Priority Memory Management).

Prioritized Memory Management

The Prioritized Memory Management mechanism, in addition to providing the thrashing detection capability described earlier, allows active code segments to be protected from overlay by lower-priority code. In order to prevent the total takeover of memory by high-priority code GISMO periodically sweeps through memory and lowers the priority of code segments which have not been accessed since the last time the sweep was performed. In this manner, segments not actively used by high-priority programs are reduced in priority (decayed) until they reach a point where they can be overlayed by lower-priority segments.

Figure A-2 presents the logic flowchart of the general operation of the thrashing detection code.

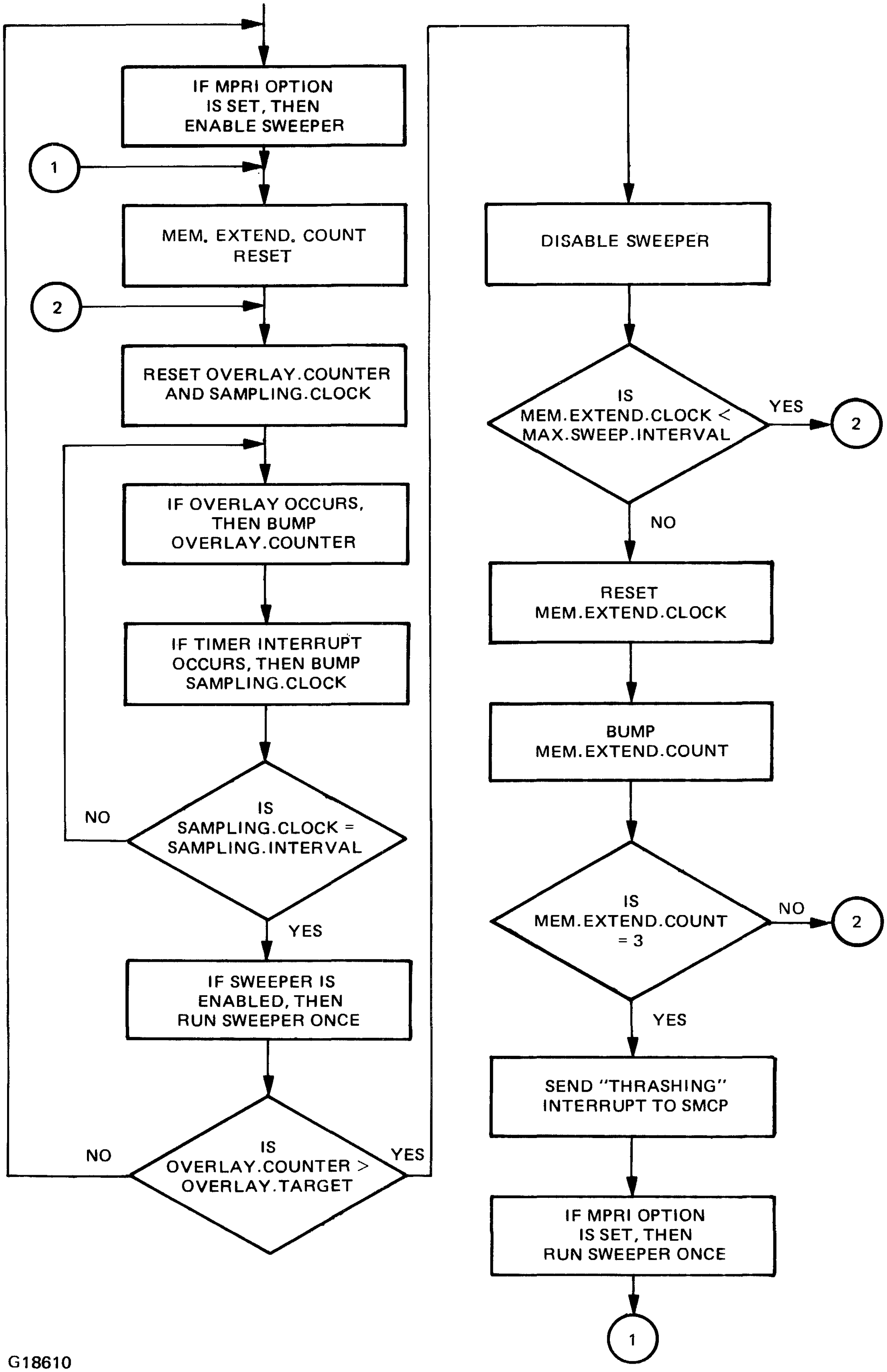


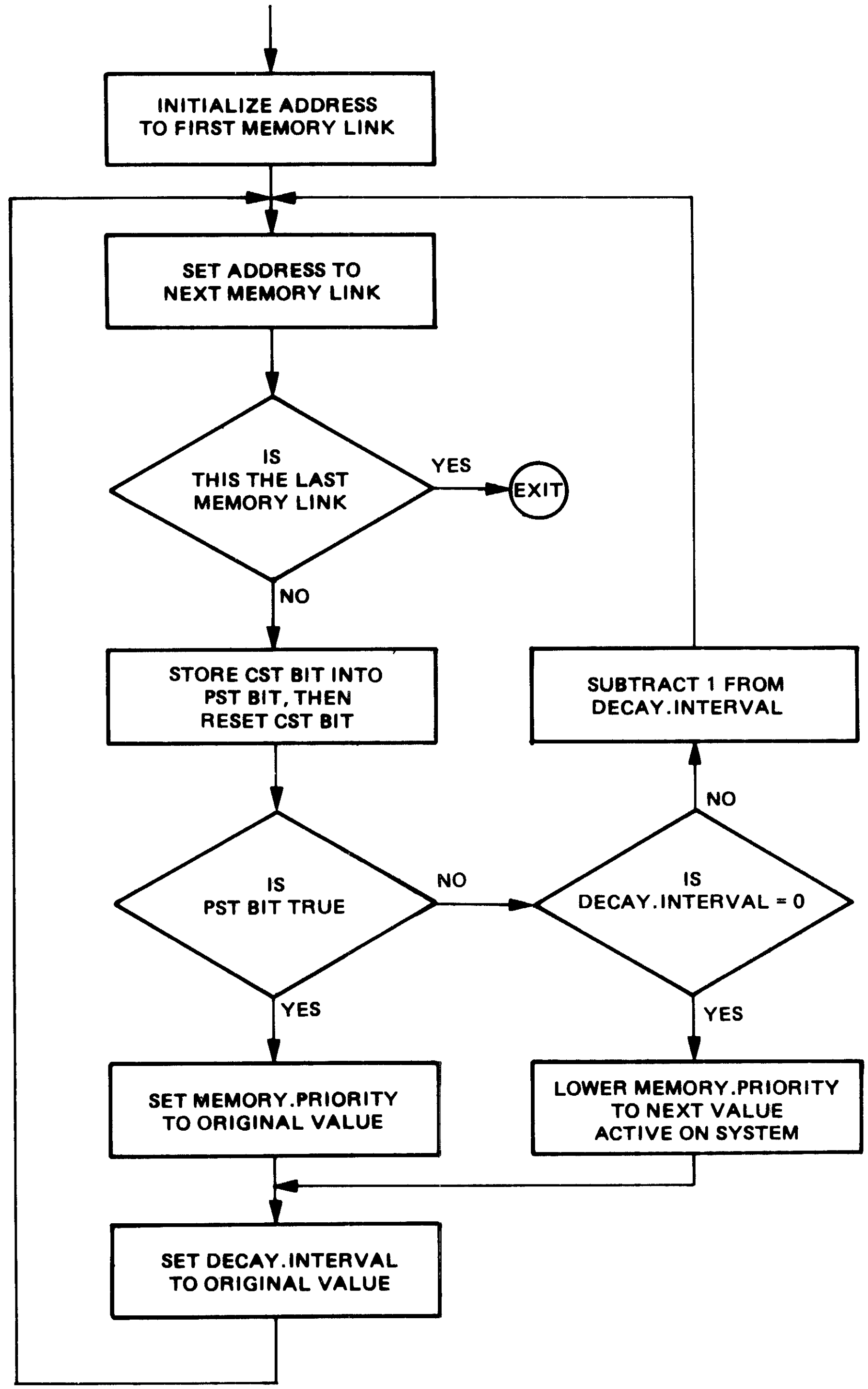
Figure A-2. Thrashing Detection Logic Flowchart

The logic flowchart presented in figure A-3 graphically depicts the process by which the sweeper in GISMO examines each memory link and decays the priorities of unused segments. Certain data names that have been used actually exist in the GISMO code. Other data names are fictitious, merely being used in the flowchart to represent a specific function. Their definitions are as follows:

DECAY.INTERVAL
: A value computed from the SAMPLING.INTERVAL and the SECONDS.BEFORE.DECAY specification which specifies the number of memory sweeps during which an unused segment cannot be reduced in priority. For example, if the SAMPLING.INTERVAL is 8 (0.8 seconds) and the SECONDS.BEFORE.DECAY attribute for a program is set to 20, the DECAY.INTERVAL for all important code segments is set to 25. In other words, the code segment is protected from decay for 25 sweeps through memory (25 * .8 = 20). Code segments which have not been marked as important are always marked with a DECAY.INTERVAL of 0.

MEMORY.PRIORITY
: The value specified by the MEMORY.PRIORITY control instruction attribute or the MP system command.

CST and PST
: Two bits in the memory link adjacent to a segment of memory that indicate its in-use status. The CST (CURRENT.SCAN.TOUCH) bit is set by an interpreter whenever program control is passed to the adjacent code segment. The CST bit is reset only by the sweeper in GISMO. The PST (PREVIOUS.SCAN.TOUCH) bit contains the setting of the CST bit from the previous execution of the sweeper.



G18611

Figure A-3. Memory Sweeper Logic Flowchart.

APPENDIX B
SYSTEM PERFORMANCE MONITORING

This appendix describes a feature which allows certain aspects of the B 1000 system performance to be dynamically monitored and displayed during execution using the system console.

GISMO contains code that can be optionally retained during the CLEAR/START process to monitor system performance. The system operator is allowed to interact with this performance monitoring code through the system console, using the 24 data entry switches to specify the activity to be monitored, and reading the gathered information on the STATE light and the 24 main exchange lights on the B 1000 system.

Once familiar with the use of the performance monitoring system, it is possible for the system operator to dynamically tune the operation of individual programs and, in fact, the entire system to the workload being processed.

The use of the performance monitor function adds to system operations overhead and results in less than 5 percent degradation in overall system performance.

Through the console and the performance monitoring code in GISMO the system operator can monitor the following activities:

1. I/O activity by channel or by unit on a given channel.
2. The following subsets of processor activity:
   1) MICRO-MCP/MICRO.SCHEDULER time.
   2) SMCP time.
   3) User time (by mix number or total user time).
3. Overlay activity of the following;
   1) SMCP code, including interpreter and MICRO-MCP segments requested by the SMCP.
   2) User program code, including interpreter and MICRO-MCP segments requested by user programs (by mix number or total)
   3) User program data (by mix number or total).

System Console

In terms of the performance monitoring operator interface, B 1000 systems have the same system console, consisting of 24 main exchange lights, 24 data entry switches (console switches), and the STATE light. The system operator enters monitor specifications through the console switches.

The 24 exchange lights are divided into two groups:

1. The left 16 lights are used as a bar graph.
2. The right 6 lights are used as a fixed display of various activities.
3. The 2 lights between the left 16 lights and the right 6 lights are not used.

The dual processor configuration of the B 1000 system has additional lamp capabilities. Any of the described functions can be monitored on the slave processor. Determining which processor is currently being viewed is controlled by the MASTER/SLAVE display knob or switch on the front console panel. Care must be taken as to what to monitor on the slave processor. Any monitoring of such work as I/O activity, overlays, and SMCP activity results in a null display by the lamps because none of this work is performed by the slave processor.

Operational Details

The following paragraphs describe the operation of the B 1000 performance monitoring capability.

Invoking the Performance Monitoring Capability

The performance monitoring lights are made active under the following conditions:

1. Appropriate MCP options must be set (using the SO system command).
2. Appropriate console switches must be set.
3. SE = 4 must be entered.

MCP Performance Monitoring Options

Performance monitoring requires retention of two to four discardable segments of GISMO by the SYSTEM/INIT program during CLEAR/START. Which segments are retained is determined by the following three options:

FLMP
: If this option is set, the GISMO code necessary to provide the fixed lamp display, is retained by SYSTEM/INIT during the CLEAR/START procedure. There are no further options or specifications necessary for the fixed lamp display. Retaining the code at the time of the CLEAR/START operation is all that is necessary to invoke the display.

VLCP
: If this option is set, GISMO segments that allow specification and display of processor usage or overlay activity are retained.

VLIO
: If this option is set, GISMO segments that allow specification and display of activity on the I/O subsystem, processor usage or overlay activity are retained.

Setting either the VLCP or VLIO options does not, in itself, cause any activities to be displayed; they only control which GISMO segments are to be retained during the CLEAR/START process. When this option is set, the GISMO code necessary to provide the fixed lamp display, is retained by SYSTEM/INIT during the CLEAR/START procedure. Since there are no further options or specifications necessary for the fixed lamp display, retaining the code at the time of the CLEAR/START operation is all that is necessary to invoke the display.

The following warning is to be remembered in connection with the FLMP, VLCP, and VLIO options:

1. If a CLEAR/START operation is performed using GISMO and any of the performance monitoring options are set, the STATE light (and the 24 main exchange lights for the B 1000 system) behaves quite differently than normal. This behavior may lead one to conclude that the system is malfunctioning when, in fact, it is running quite normally.

Specification of Activities to be Displayed

Specifying an activity to be displayed implies that whenever the requested activity is in process, the STATE light is ON, and whenever the requested activity is not in process, the STATE light is OFF.

Provided that the appropriate GISMO segments have been retained during the CLEAR/START operation, the specification for the desired display can be changed at any time. If the GISMO segments supporting the requested activity have not been retained, no activity is displayed.

The activity to be displayed is selected on the console switches from one of three groups:

1. I/O activity
2. Processor activity
3. Overlay activity

In order to make any selections, the console switches must first be enabled for use by GISMO, using the SE system command (SE 4; in section 2).

NOTE
In the discussions and figures that follow, a 1 indicates a switch or light that is ON, a 0 indicates a switch or light that is OFF, and an x indicates a switch or light position that does not apply.

Console switches 0 and 1 are always used to specify the B 1000 Bar Graph Scale Factor (refer to the paragraph entitled Bar Graph in this appendix). Console switches 2, 3, and 4 are used to specify which of the following three groups of activities to monitor and display:

Switch Value	**Activity Group**
000	Display disabled
1xx	I/O
01x	CPU
001	Overlay

The remainder of the switches have pre-defined functions that depend upon the Activity Group selected. These functions are discussed in detail in the paragraphs that follow.

Summary of Switch Specifications

Table B-1 summarizes the switch specifications used for requesting activities to be monitored and displayed.

Table B-1. Switch Specification Summary

<table>
<tr><th></th><th colspan="7">Console Switch Number</th></tr>
<tr><td></td><td colspan="2">0 1 2 3</td><td>4 5 6 7</td><td>1 1
8 9 0 1</td><td>1 1 1 1
2 3 4 5</td><td>1 1 1 1
6 7 8 9</td><td>2 2 2 2
0 1 2 3</td></tr>
<tr><td>I/O</td><td rowspan="3">S
c
a
l
e</td><td>1 0</td><td>Channel Number</td><td colspan="4">Tape Units (1-16, left to right)
Disk Units (0-15, left to right)</td></tr>
<tr><td>CPU</td><td>0 1</td><td>U M I S</td><td colspan="4" rowspan="2">Mix Number (right-justified)</td></tr>
<tr><td>OVLY</td><td>0 0</td><td>1 M U U
C C D</td></tr>
</table>

The meaning of the abbreviations used in table B-1 are as follows:

Abbreviation	Meaning
C	I/O control activity
U	User processor activity
I	Idle time
M	MICRO-MCP/MICRO.SCHEDULER processor activity
S	SMCP processor activity
MC	SMCP code, interpreter, and MMCP overlays
UC	User code, interpreter, and MMCP overlays
UD	User data overlays

Specification of I/O Activity Monitoring

Table B-2 depicts the switch specifications used to request the monitor and display activities on the I/O subsystem.

Table B-2. I/O Activity Switch Specifications

<table>
<tr><th colspan="6">Console Switch Specification</th></tr>
<tr><td>0 1 2 3</td><td>4 5 6 7</td><td>1 1
8 9 0 1</td><td>1 1 1 1
2 3 4 5</td><td>1 1 1 1
6 7 8 9</td><td>2 2 2 2
0 1 2 3</td></tr>
<tr><td>x x 1 C</td><td>Channel</td><td colspan="4">Tape Units (1-16, left to right)
Tape Units (0-15, left to right)</td></tr>
</table>

Specification can be made (by turning on bit 2 of the console switches) that the STATE light is to be ON when there is an I/O operation in process on the selected channel, designated as a hexadecimal number (@0@-@E@) in bits 4-7 of the console switches. The meaning of the C bit (bit 3) and the units mask (bits 8-23) is dependent on the type of device selected described in the following paragraphs.

For devices other than disk and magnetic tape, the units mask is ignored. Selecting the channel and setting the C bit causes all activity on the specified channel to be shown. For example, the following console switch pattern causes all activity on channel 4 to be displayed (assume that channel 4 is not a disk or magnetic tape device):

xx11 0100 xxxx xxxx xxxx xxxx

For magnetic tape devices (including cassette) and disk devices not having overlapped seek (head-per-track disk and diskette), selecting the channel and setting the C bit causes all activity through the control to be monitored and displayed, regardless of the unit involved. If the C bit is reset, then only the activity for the units specified in the units mask (bits 8-23) is displayed. For example, the following switch pattern causes activity on units 2 and 6 of channel 10 (assume that these are magnetic tape units) to be displayed:

xx10 1010 0100 0100 0000 0000

In designating specific units on the unit mask, magnetic tape and cassette units are numbered from 1 to 16 (corresponding to tape units A through P), and disk units are numbered from 0 to 15 (corresponding to disk units A through P). The leftmost bit (bit 8) of the units mask represents unit A for the type of device selected, with the rest of the bits numbered accordingly.

For disk devices having overlapped seek capability (disk pack/cartridge), it is possible for the channel (control) to be idle when an I/O operation is in process; that is, when one or more units are seeking. If the C bit is set, the STATE light is ON only when the channel is busy (typically this excludes disk seek time). If the C bit is reset, the STATE light is ON whenever there is an I/O in progress for the units specified in the units mask (including disk seek time).

For exchanges, if the primary channel (the lowest channel on the exchange) is specified and the C bit is reset, all activity on the units specified in the units mask is shown, regardless of which control in the exchange actually performs the I/O operation. Setting the C bit causes only activity on the specified channel to be shown. If a secondary channel is designated, then the units mask is ignored (and no unit activity is shown); setting the C bit displays activity through the specified channel only. Thus, individual unit activity can only be monitored on an exchange by specifying the primary channel.

NOTE

TEST operations (including TEST.AND.WAIT operations) and PAUSE operations are never displayed.

Specification of Processor Activity Monitoring

Table B-3 depicts the switch specifications used to request the monitor and display activities on the processor.

Table B-3. Processor Activity Switch Specifications

Console Switch Number					
0 1 2 3	4 5 6 7	1 1 8 9 0 1	1 1 1 1 2 3 4 5	1 1 1 1 6 7 8 9	2 2 2 2 0 1 2 3
x x 0 1	U M I S	Mix Number (right-justified)			

Specification can be made by turning off bit 2 and turning on bit 3 of the console switches so that the STATE light is to be ON during execution of:

1. User code
2. MICRO-MCP/MICRO.SCHEDULER code
3. Idle time
4. SMCP code

Any combination of these four classes of processor activity can be specified, using bits 4-7 of the console switches. If all four are specified together, the STATE light is always ON.

If the U bit (bit 4) is set and the mix number field (bits 8-23) is zero, then the STATE light is ON when any normal-state program is running. If the mix number field is non-zero, then the STATE light is ON only when the specified normal-state program is running. The mix number field is interpreted by GISMO as four 4-bit decimal digits, rather than as a 16-bit binary number. For example, the following switch pattern specifies that user processor activity for mix number 123 is to be displayed:

xx01 1000 0000 0001 0010 0011

As stated above, any combination of the four specifications can be used together. The mix number field is ignored, however, for any except the U bit. For example, the following switch pattern specifies that the STATE light is ON, whenever mix number 2345 is running or the processor is idle:

xx01 1010 0010 0011 0100 0101

NOTE

SOFT.IO time (in GISMO) is not isolated separately and is displayed as processor time used by whatever activity was running when SOFT.IO was invoked.

Specification of Overlay Activity Monitoring

Table B-4 depicts the switch specification used to request the monitor and display of code and data overlay activities.

Table B-4. Overlay Activity Switch Specifications

Console Switch Number					
0 1 2 3	4 5 6 7	1 1 8 9 0 1	1 1 1 1 2 3 4 5	1 1 1 1 6 7 8 9	2 2 2 2 0 1 2 3
x x 0 0	I M U U C C D	Mix Number (right-justified)			

Specification can be made (by turning off bits 2 and 3 and turning on bit 4 of the console switches) that the STATE light is to be ON when an overlay operation is in process; that is, from the time that the overlay request is recognized by the SMCP until the overlay is complete (including any disk operations) and the requesting program is ready to continue execution.

Following are the three types of overlays that can be shown:

1. MCP code overlays, including SMCP code segments, as well as SDL2 Interpreter and MICRO-MCP segments requested by the SMCP.
2. User code overlays, including user code segments, as well as interpreter and MICRO-MCP segments requested for a user program.
3. User data overlays.

When user code or user data overlays are requested and the mix number field is zero, then all user code or user data overlays, or both are shown. If the mix number field is zero, then only code or data overlays or both overlays for the selected user program are shown. For example, the following switch pattern specifies that SMCP overlays and user code overlays for all tasks in the mix are to be displayed:

xx00 1110 0000 0000 0000 0000

The following switch pattern specifies that SMCP overlays and user data overlays for mix number 5432 are to be displayed:

xx00 1101 0101 0100 0011 0010

NOTE

SDL, SDL2, UPL, or UPL2 overlays for PAGED arrays do not necessarily cause corresponding disk I/O operation, since the MCP attempts to use available memory outside of the Run Structure of the program for temporary storage of the array page, before resorting to disk storage.

Variable and Fixed Lamp Displays

The B 1000 system allows the 24 main exchange lights to be utilized as a bar graph and a fixed display of certain activities.

Bar Graph

The processor hardware timer is used by GISMO to accumulate the time involved in the selected activities. At each interval <n> (specified by the Bar Graph Scale Factor), the accumulated time is converted into a percentage of <n> and is shown on the Bar Graph. Each light in the Bar Graph group represents 1/16th of the interval <n> (left to right, 0 to 100%), with the following two restrictions:

1. If the activity or activities selected occurred during the interval <n> (regardless of how little), at least the leftmost light will be ON for the succeeding interval <n>.
2. If the activity or activities selected did not occupy 100% of the interval <n>, the rightmost light will not be ON for the succeeding interval <n>.

Bar Graph Scale Factor

The duration of the interval <n> is specified in the scale field of the console switches (bits 0-1), as shown in table B-5.

Table B-5. B 1000 Bar Graph Scale Factor

Switches	Interval <n>	Each Light Represents
00	400 ms	25 ms
01	800 ms	50 ms
10	1600 ms	100 ms
11	3200 ms	200 ms

As an example of what might be seen on the Bar Graph, assume that the following console switch pattern is selected:

0101 1000 0001 0010 0011 0100

This pattern specifies that user processor activity for mix number 1234 is to be displayed on the STATE light (and hence, the Bar Graph), and that the interval <n> is 800 milliseconds. Thus, every 800 milliseconds the leftmost 16 lights of the main exchange display is changed to show what percentage of the just-ended 800-millisecond interval that mix number 1234 was executing on the processor.

For example, if the main exchange lights are:

1111 0000 0000 0000 xxxx xxxx

then mix number 1234 was executing on the processor for 25% of the previous 800-millisecond interval (that is, 200 milliseconds). If the main exchange lights are:

1100 0000 0000 0000 xxxx xxxx

then mix number 1234 was executing on the processor for 12.5% of the previous 800 milliseconds (that is, 100 milliseconds).

As another example, assume that the following console switch pattern is selected:

0010 1001 1100 0000 0000 0000

This pattern specifies that I/O activity on channel 9 (assume that this is a disk pack channel), units 0 and 1, is to be displayed; the interval <n> is 400 milliseconds. If the main exchange lights are:

1111 1111 1111 0000 xxxx xxxx

then there was an I/O operation in process on either DPA or DPB for 75 percent of the previous 400-millisecond interval (that is, 300 milliseconds).

Fixed Lamp Display

The rightmost six lights of the main exchange display on the B 1000 processor form a fixed display group which show specific activities if the FLMP option is set. On these lights, six activities are shown exactly as they would appear, if selected, on the STATE light. The fixed light group is completely independent of whatever is being shown (if anything) on the STATE light and Bar Graph. There are no optional specifications; all that is necessary to invoke this display is to set the FLMP option and perform a CLEAR/START operation (using GISMO), thus causing the necessary code to be retained by SYSTEM/INIT. None of the other two performance monitoring options (VLCP and VLIO) need to be set.

The six activities displayed are as follows:

Light	Activity
18	Any disk I/O operation in process. Here activity is shown for all disk channels and units on the system, whereas on the STATE light only one channel can be shown at a time.
19	Any overlay in process. The same as is shown on the STATE light when all three of the overlay options are selected and the mix number field is zero.
20	SMCP processor activity.
21	Idle time.
22	MICRO-MCP/MICRO.SCHEDULER processor activity.
23	User program processor activity.

Lights 20-23 are mutually exclusive. No two will be ON at the same time and together they indicate a total of 100% of processor usage.

APPENDIX C
DISK FILE ACCESS METHODS

The B 1000 MCP provides for three basic disk file access techniques: SERIAL, RANDOM, and DELAYED RANDOM. There are, however, a number of variations of these basic access techniques that are available for use. Some of these variations can be specified or declared within a source program, and all can be specified through attributes of the FILE control statement.

This appendix provides a general overview of the disk file access methods available, together with a description of their characteristics and restrictions.

Logical Versus Physical I/O

Normal-state programs perform logical I/O operations, consisting of READ and WRITE requests; the MCP converts these requests into the necessary data transfer operations and, where required, physical READ and WRITE operations. Logical I/O requests deal with records (sometimes referred to as logical records), whereas physical I/O operations deal with blocks (also called physical records).

Because programs deal only with logical records, the physical characteristics of a file (records-per-block, blocks-per-area, number of areas, and even the absolute disk address of each area, for example) are of no concern to the programmer. These physical characteristics are used only by the operating system, which transforms logical I/O requests from programs into the necessary physical I/O terms.

Any logical read operation by a program results in a transfer of data (the logical record) from the physical record buffer to a logical record work area allocated within the data space of the program. Inversely, a logical WRITE by a program results in a transfer of data (the logical record) from the logical record work area within the program's data space to the physical record buffer.

File Information Block

When any file is opened by a program, the SMCP allocates memory outside the data space of the program for use in managing the physical I/O of that file. This non-overlayable memory space contains the File Information Block (FIB), a structure which maintains information about the logical characteristics of the file as declared within the program, including logical record size, physical record size, records-per-block, current buffer pointer, logical record pointer, record and block count, and so forth. Since a file can be opened having logical characteristics that are different from its physical characteristics, the information in the FIB may be entirely different from information in the disk file header.

I/O Descriptors and File Buffers

For each buffer declared for the file, one I/O descriptor and memory space for the block is also allocated. This space is adjacent to the FIB, and is part of the non-overlayable memory space allocated for managing the physical I/O of the file. The I/O descriptor is used by the MCP for performing the physical I/O operations to or from the associated buffer.

Buffers are linked together in such a fashion that the next buffer to be used for a physical I/O operation is always the one that was accessed least recently. For SERIAL files, this means that the buffers are linked in a round-robin order. For RANDOM and DELAYED RANDOM files, the buffer links are dynamically updated by the MMCP to maintain them in order from the least to the most recently accessed.

Disk File Header

A disk file header (DFH) is associated with every disk file opened by a program. The DFH is a structure separate from the FIB which maintains the physical characteristics of a disk file, including logical record size, physical record size, records per block, blocks per area, areas in use, maximum areas allowed, end-of-file pointer, and the absolute disk address of each area assigned to the file. Also, since more than one program may have the same disk file open simultaneously, the number of users (or user counts) are also maintained in the DFH.

The disk file header for an old file (that is, one which has been entered in the disk directory) is stored on disk. When such a file is opened by a program, the SMCP reads the DFH into memory and uses the information stored in it to construct portions of the FIB.

The disk file header for a new file (that is, one which has not yet been entered in the disk directory) is constructed in memory by the SMCP when the file is opened. Temporary disk space for the DFH is obtained by the SMCP; this disk space becomes the permanent location of the DFH if the file is closed and entered into the disk directory.

The DFH may or may not be resident in memory while the associated file is open. If any programs which are sharing the file have the file opened RANDOM or DELAYED RANDOM, the DFH is always memory-resident; otherwise, the DFH is only brought into memory by the SMCP when information must be obtained from or stored into it.

Disk File Access Characteristics

The access characteristics of a disk file are basically determined by the method in which it is processed: SERIAL, RANDOM, or DELAYED RANDOM.

Serial Files

Records in a Serial disk file are generally obtained from or placed into the file in a sequential manner. That is, a logical record is made available from the next position in the file on a read operation, or a logical record is placed into the next position in the file on a write operation. The specific access characteristics of a serial file are dependent, however, on the way in which the file is opened (INPUT, OUTPUT, or INPUT/OUTPUT).

Input Serial Files

Serial disk files opened INPUT have the following characteristics:

1. When the file is opened, the SMCP initiates a physical read operation to fill each buffer assigned to the file.
2. The record address is updated by the MMCP to point to the next logical record to access following a logical read operation.
3. If a logical read operation empties the current buffer, the MMCP initiates a physical read operation to refill the buffer and updates the buffer pointer to point to the next buffer to access.
4. If the current disk area has been emptied, the SMCP obtains the address of the next disk area from the DFH just prior to initiating the physical read operation. If the next disk area is not allocated (that is, the area address in the DFH is zero), the SMCP positions the disk area pointer to the beginning of the next allocated disk area. This operation is completely transparent to the program.
5. Logical read requests beyond end of file are not allowed, and cause termination of the program if no EOF action is specified (for example, AT END or ON EOF).
6. When the file is closed, no physical I/O operations are initiated by the SMCP for the buffers assigned to the file.

Output Serial Files

Serial disk files opened OUTPUT have the following characteristics:

1. When the file is opened, no physical I/O operations are initiated by the SMCP for the buffers assigned to the file.
2. The record address is updated by the MMCP to point to the next logical record position to access following a logical write operation.
3. If a logical write operation fills the current buffer, the MMCP initiates a physical write operation to write the buffer to disk and updates the buffer pointer to point to the next buffer to access.
4. If the current disk area has been filled, the SMCP obtains disk space for the next disk area just prior to initiating the physical write operation, and stores the address of the new disk area into the DFH.
5. Logical write requests beyond end of the file are allowed, adding logical records to the end of the file (up to the declared maximum file size). The EOF.POINTER field in the FIB is updated by the MMCP to include the logical records that are added.
6. Logical write requests beyond the declared maximum file size are not allowed, and cause termination of the program if no EOF action is specified (for example, AT END or ON EOF).
7. If the current buffer is partially filled when the file is closed, the SMCP writes the partial block to disk. If the EOF.POINTER in the FIB is greater than the EOF.POINTER field in the DFH, the DFH is updated to reflect the new value for end of the file.

Input/Output Serial Files

The access characteristics of any serial disk file opened INPUT/OUTPUT (usually referred to as I/O Sequential) are determined solely by the setting of the EXTEND attribute for that file.

EXTEND Attribute Set

When the EXTEND attribute is set on an I/O sequential disk file, the logical I/O characteristics are as follows:

1. When the file is opened, the SMCP initiates a physical read operation for each buffer assigned to the file.
2. The record address is updated by the MMCP to point to the next logical record to access following a logical write operation.
3. The record address is updated by the MMCP to point to the next logical record to access prior to a logical read operation, but only if the previous logical I/O request was also a read operation.
4. Logical write requests beyond the end-of-file record are allowed, adding logical records to the end of the file (up to the declared maximum file size). The EOF.POINTER field in the FIB is updated by the MMCP to include the logical records that are added.
5. Logical write requests beyond the declared maximum file size are not allowed, and cause termination of the program if no EOF action is specified (for example, AT END or ON EOF).
6. If a logical write operation fills the current buffer, the MMCP initiates a physical write operation to write the buffer to disk and updates the buffer pointer to point to the next buffer to access.
7. If the current disk area has been emptied, the SMCP obtains the address of the next disk area from the DFH just prior to initiating the physical read operation. If the next disk area is unallocated (that is, the area address in the DFH is zero), the SMCP positions the disk area pointer to the beginning of the next allocated disk area. This operation is completely transparent to the program.

8. If the current disk area has been filled by write requests after reaching the end-of-file record, the SMCP obtains disk space for the next disk area just prior to initiating the physical write operation, and stores the address of the new disk area into the DFH.
9. If the current buffer has been updated, the SMCP writes the block to disk when the file is closed. If the value of the EOF.POINTER field in the FIB is greater than the value of the EOF.POINTER field in the DFH, the DFH is updated to reflect the new value for end of file.

EXTEND Attribute Reset

When the EXTEND attribute is reset on an I/O Sequential disk file, the logical I/O characteristics are as follows:

1. When the file is opened, the SMCP initiates a physical read operation for each buffer assigned to the file.
2. The record address is updated by the MMCP to point to the next logical record to access prior to a logical read operation.
3. The record address is not updated on a logical write operation, allowing the same record to be written more than once between logical read operations.
4. Since a logical write operation does not update the record address and a logical read operation beyond the end-of-file record is not allowed, records cannot be added to the end of the file. Logical write requests after the end-of-file record has been reached overwrite the last logical record in the file.
5. If a logical write operation fills the current buffer, the MMCP initiates a physical write operation to write the buffer to disk and updates the buffer pointer to point to the next buffer to access.
6. If the current disk area has been emptied, the SMCP obtains the address of the next disk area from the DFH just prior to initiating the physical read operation. If the next disk area is not allocated (that is, the area address in the DFH is zero), the SMCP positions the disk area pointer to the beginning of the next allocated disk area. This operation is completely transparent to the program.
7. If the current buffer has been updated, the SMCP writes the block to disk when the file is closed.

NOTE

The setting of the EXTEND attribute only has significance in connection with serial disk files opened INPUT/OUTPUT. The EXTEND attribute is ignored by the MCP for all other files.

Random Files

Records in a random file are generally obtained from or placed into the file in a random manner, based solely on the relative record number (the key) specified in the logical read or write request. That is, the logical record identified by the key is made available from the file on a read operation, or a logical record is placed into the file at the position specified by the key on a write operation.

Any logical read or write request by a program must specify the relative record number desired. The MMCP uses the relative record number to compute the physical position (disk area, block number, and record position within the block) of the logical record within the file.

The characteristics of random disk files are as follows:

1. When the file is opened, no physical I/O operations are initiated by the SMCP.
2. For files opened INPUT or INPUT/OUTPUT, if the block containing the requested logical record is not already in memory, the MMCP first initiates a physical read operation to read the block into the next buffer. Additional logical read requests do not cause a physical read operation, as long as the block remains in memory.
3. Logical read requests referencing an unallocated disk area or beyond the end-of-file record are not allowed, and cause termination of the program if no INVALID KEY action is specified.
4. Every logical write request causes the MMCP to initiate a physical write operation to write the block to disk.
5. Logical write requests beyond the end-of-file record are allowed, and cause the value of the EOF.POINTER field in the FIB to be updated by the MMCP to reflect the maximum allowable key.
6. A logical write operation to an unallocated disk area causes the SMCP to obtain disk space for that area just prior to initiating the physical write operation. The address of the new disk area is stored into the DFH.
7. When the file is closed, no physical I/O operations are initiated by the SMCP for the buffers assigned to the file. If the value of the EOF.POINTER field in the FIB is greater than the value of the EOF.POINTER field in the DFH, the DFH is updated to reflect the new value for end of file.

Delayed Random Files

The delayed-random access method is intended for use where random, input/output capability is desired but where, for the most part, the file is accessed sequentially.

The access characteristics of delayed-random files are identical to those of random files, with the following exceptions:

1. Logical read and write requests do not cause any physical I/O operations as long as the block remains in memory. A block in memory is overlayed if a request is made for another block not currently in memory. If the block chosen to overlay (the least recently accessed buffer) has been updated in memory by a logical WRITE operation, it is written back to its location on disk by the MMCP before the new block is read. Periodically (at each SMCP N.SECOND interval), all blocks that have been updated in memory are written to disk by the SMCP.
2. Since none of the physical I/O operations are overlapped with user processing on a delayed-random file, a file that is accessed more randomly than sequentially performs better as a random file than as a delayed-random file. Similarly, on a file accessed mostly sequentially, but where all physical I/O time is overlapped with user processing, a random file also performs better than a delayed-random file, because the program is not forced to wait for the physical write operations to complete.
3. Unblocked random files perform much better than unblocked delayed-random files. Because of this, the SMCP automatically changes any unblocked delayed-random file to random during file open.
4. When the file is closed, the SMCP writes back to disk any buffer in memory that has been updated. Note that the integrity of a delayed-random file can be guaranteed only if the file is closed. If the system is halted before the file is closed, integrity is guaranteed only if the last logical write operation occurred prior to the last SMCP N.SECOND interval; otherwise, buffers updated in memory will not have been written to disk.

AUDITED and PROTECTED Files

In the event of a system interrupt, the file attributes AUDITED and PROTECTED provide two methods of ensuring the integrity of an open file. These file attributes are described in section 4 of this manual and a discussion of the two protection methods follows.

The differences between the two attributes are:

1. The AUDITED file attribute preserves disk writes to the file by suspending a program until the write is complete.
2. The PROTECTED file attribute preserves the end of file (EOF) pointer by writing a protection pattern or updating the the EOF pointer after each write.

A file can be PROTECTED and AUDITED. In this case the data that has been written to disk and recovery of the EOF pointer are guaranteed.

NOTE
For indexed organizational files, the two attributes are the same because they were both implemented for indexed files before protected files were implemented.

AUDITED Files

The user of an AUDITED file is guaranteed that a write to the file has taken place and that the data is on disk. If the file is an old file, that file will be on disk after a clear start or an abnormal program termination. If the file is a new file the file may be lost after a system halt; additions before the EOF pointer can not be guaranteed because the EOF pointer may not have been updated.

PROTECTED Files

The user of a PROTECTED file is guaranteed that data written to disk before the end of file (EOF) pointer is recoverable after a CLEAR/START operation or program termination. For PROTECTED serial access files, the EOF pointer is adjusted to include the last record in the file after a CLEAR/START operation is performed. For PROTECTED Random access sequential files, the EOF pointer is updated, if necessary, after each write operation.

When a serial file is extended the remainder of the last block and the next block are initialized with a protection pattern. When these write operations are complete, the disk file header (DFH) is updated to record that a protected file is being extended. As the user's block becomes full, a write operation of both the user's data and the next pattern block is initiated. A pattern write operation occurs two blocks ahead of the user's data block, and thus the program does not need to wait for the pattern write operation to complete. This process continues until the user program stops extending the file. The process is modified slightly at the end of an area. Then, after a clear start is perfomed, the end of file pointer can be adjusted by searching the file from the old EOF pointer until a protection pattern is found.

Sequentially organized files are recovered according to their physical file descriptions in the DFH. If a file is opened with a different record length or blocking factor than its physical description, data may be lost. Also, partial data transfers can occur if the halt button is pushed between transfers of data to the disk I/O control. It is recommended that the system be halted with the HALT ODT command or the interrupt switch because the GISMO program waits for disk input/output operations (I/O) to complete.

A random file is protected by updating its EOF pointer after each write operation. If the DFH is updated, then it is written to disk after the user's data block is written. Updating the DFH causes one extra random I/O per block. Since there is a write for each record in a block, a halt occurring between writing a block and updating the DFH, could cause, at most, one record to be lost. If the AUDITED file attribute is set, the program is suspended waiting for both the data write and DFH update. In this case, no records are lost.

There is extra I/O activity involved in providing the protection requested. Extra I/O operations are included in the block count for the file, and a count of the number of times the user program had to wait for a protection write is also maintained. Both of these counts are logged.

Disk File Access Specifications

The access characteristics to be used by a disk file can be specified either in the source program or, following compilation, with attributes of the FILE control statement.

Source Program Specifications

Each source language available on the B 1000 system has different capabilities and limitations in regard to the specification of file attributes, and therefore, in the disk file access techniques that can be requested. Table C-1 summarizes the disk file access techniques that can be specified or changed using the FILE control statement following compilation.

Table C-1. Disk File Access Specification Summary

	BASIC	COBOL	FORTRAN	RPG	SDL/UPL
SERIAL FILES:					
INPUT	N	S	S	S	S
OUTPUT	N	S	S	S	S
INPUT/OUTPUT					
EXTEND	N	S	F	N	S
NO EXTEND	N	F	F	S	S
RANDOM FILES					
INPUT	N	S	F	S	S
OUTPUT	N	S	F	S	S
INPUT/OUTPUT	S	S	S	S	S
DELAYED RANDOM FILES:					
INPUT	N	F	F	F	S
OUTPUT	N	F	F	F	S
INPUT/OUTPUT	F	F	F	F	S

Legend:

S Access technique can be declared directly in the source program.
F Access technique cannot be declared directly in the source program, but can be specified through FILE attributes.
N Access technique can be specified through FILE attributes, but is not compatible with the file access characteristics of the language.

BASIC File Declarations

Disk files in the BASIC language are declared using the FILES statement. In order to faciliate the file handling characteristics of the BASIC language, all disk files are implicitly specified as random INPUT/OUTPUT by the compiler. Changes to this default, other than possibly changing random to delayed-random, are not recommended, and may cause undesired results during execution.

COBOL File Declarations

The COBOL language provides the ability to specify two access techniqus for disk files, random and serial. These access methods are declared in the INPUT-OUTPUT SECTION of the ENVIRONMENT DIVISION, using the ACCESS MODE clause. The syntax is as follows:

```
ENVIRONMENT DIVISION.
     .
     .
     .
     .
INPUT-OUTPUT SECTION.
FILE-CONTROL.
     SELECT file-name ASSIGN TO DISK
               ACCESS MODE IS access-mode.
```

The access mode can be specified as either random or sequential. Delayed-random cannot be declared in a COBOL source program, but can be specified following compilation using the FILE control statement.

For all files declared as SEQUENTIAL, the COBOL compiler implicitly sets the the EXTEND attribute. This allows records to be added to the end of the serial disk file that is opened INPUT/OUTPUT. There is no means for specifying NO EXTEND in a COBOL source program; however, the FILE control statement may be used following compilation to reset the EXTEND attribute, if necessary.

FORTRAN File Declarations

The FORTRAN language allows disk files to be declared as either serial or random using the FILE declaration statement. Unless the key word random is included in the attribute list, the access mode is assumed to be serial.

Example:

```
Serial file: FILE 4=INPUT, UNIT=DISK
Random file: FILE 3=SOURCE, UNIT=DISKPACK, RANDOM
```

Since all file opens are implicitly performed when the first logical read or write request is received by the MCP, the access technique for serial files is specified by the first logical I/O request. A read operation causes the file to be opened INPUT, and a write operation causes the file to be opened OUTPUT. Serial INPUT/OUTPUT files cannot be declared directly in the FORTRAN source program, but can be specified using the INPUT and OUTPUT attributes of the FILE control statement following compilation.

All random file in the FORTRAN language are implicitly opened INPUT/OUTPUT, and no syntax exists for declaring delayed-random files directly in a source program. Any of these default attribute restrictions can be explicitly changed through the FILE control statement by using the appropriate attribute specifications.

SDL/UPL File Declarations

The SDL and UPL compilers provide the ability to specify all allowable disk file access techniques, using the FILE declaration statement. The syntax is as follows:

FILE<file-name> (DEVICE=DISK<access>...);

The <access> may be specified as any of the following:

Access	**Access Technique**
Serial	SERIAL (EXTEND attribute set)
Serial with Overwrite	SERIAL (EXTEND attribute reset)
Random	RANDOM
Delayed Random	DELAYED RANDOM

Files can be opened in the SDL and UPL languages either explicitly by using the OPEN statement, or implicitly when the first logical read or write request is received by the MCP. The attributes for an implied open can be specified as part of the FILE declaration statement in the source program, or can be modified following compilation using the FILE control statement.

RPG File Declarations

The access technique used by a disk file in an RPG program is declared in the File Description Specification for that file. The specific access is determined by the entries in columns 15, 16, 32, and 66, as shown in table C-2.

Table C-2. RPG Disk File Access Technique Specifications

Column				Attribute Set				
15	**16**	**32**	**66**	**SERIAL**	**RANDOM**	**INPUT**	**OUTPUT**	**NEW**
I	P			X		X		
I	S			X		X		
I	T			X		X		
I	D			X		X		
I	C				X	X		
I	P	I			X	X		
I	S	I			X	X		
I	D	I			X	X		
I	C	I			X	X		
I	P	I	A		X	X	X	
I	S	I	A		X	X	X	
I	D	I	A		X	X	X	
I	C	I	A		X	X	X	
O				X			X	X
O			A		X		X	
O		I		X			X	X
O		I	U	X			X	X
O		I	A		X		X	
O	C	I			X		X	
U	S			X		X	X	
U	D			X		X	X	
U	C				X	X	X	
U	S	I			X	X	X	
U	D	I			X	X	X	
U	C	I			X	X	X	
U	S	I	A		X	X	X	
U	D	I	A		X	X	X	
U	C	I	A		X	X	X	

Refer to the *B 1000 Systems Report Program Generator (RPG) Language Manual* for detailed information about the entries shown above in table C-1 in columns 15, 16, 32, and 66.

Delayed-random disk files cannot be declared directly in an RPG source program; however, the FILE control statement can be used following compilation to change a random file to delayed-random. Other changes to the defaults generated by the RPG compiler are not recommended, and may cause undesired results during execution.

File Attribute Specifications

The FILE control statement allows modifications to be made to any of the disk file access technique attributes, whether or not these attributes can be specified in a source program. The syntax is as follows:

FILE <file-identifier> <attributes>...;

The allowable <attributes> for use in specifying the disk file access technique can be selected from the following list:

File Attribute	Abbreviation
SERIAL	SER
RANDOM	RAN
DELAYED.RANDOM	D.R
EXTEND	EXT

When using an implied open (not allowed in the COBOL langugage), the attributes can be further defined by specification of the open type, as follows:

File Attribute	Abbreviation
INPUT	INP
OUTPUT	OUT
NEW	NEW

Any combination of these attributes can be used, where required, to specify the access technique desired. The keyword NO can be used with the EXTEND attribute or any of the implied open attributes to reset the specified attribute.

The NEW attribute is used to specify a new file to be created; if NEW is not specified, an old file (one that already exists in the disk directory) is expected. For example, specifying INPUT, OUTPUT, or INPUT OUTPUT (without NEW) causes an existing disk file to be opened and processed. Including the NEW attribute with the OUTPUT or INPUT OUTPUT attribute causes a new file to be created (NEW is ignored if OUTPUT is not specified).

Example:

```
?MODIFY TEST/PROGRAM
?FILE FILE1 SERIAL INPUT NO OUTPUT:
?FILE FILE2 RANDOM INPUT OUTPUT;
?FILE FILE3 SERIAL INPUT OUTPUT EXTEND;
?FILE FILE4 DELAYED.RANDOM;
?FILE FILE5 NO EXTEND;
```

APPENDIX D
FILE SECURITY

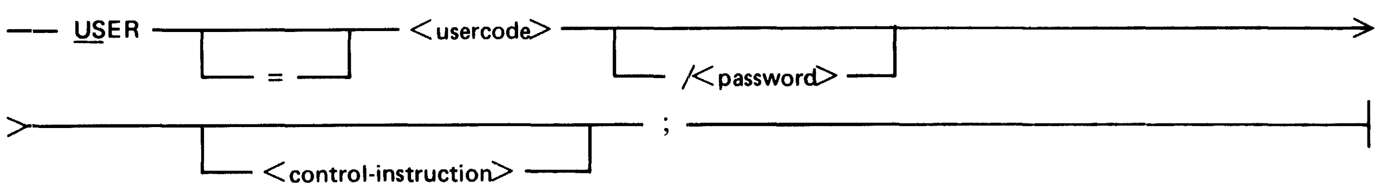
The file security system implemented on the B 1000 computer system is described in this section.

USER Command

The USER command invokes the MCP file security system mechanism in the MCP and its associated naming convention.

The USER command causes the MCP to verify the usercode and password against the directory of valid usercodes and associated passwords in the (SYSTEM)/USERCODE file on the SYSTEM disk. The validated usercode is carried with <control-instruction> and is used to apply the MCP file security naming convention to any subsequent file-identifier references.

Syntax:



Semantics:

usercode
    This field can be any valid usercode contained in the (SYSTEM)/USERCODE file.

password
    This field can be any valid password that belongs to <usercode> and is contained in the (SYSTEM)/ USERCODE file.

control-instruction
    This field can be any valid MCP command.

Examples:

Command	Response
USER SITE/PRIV PD =/=;	PD= MASTER/(SITE)/FILE1 PD= MASTER/(SITE)/FILE2 PD= MASTER/(SITE)/FILE3 END PD.
PD (SITE)/=;	PD= MASTER/(SITE)/FILE1 PD= MASTER/(SITE)/FILE2 PD= MASTER/(SITE)/FILE3 END PD.
US STUDENT/JK EX TESTPROG PR 3;	(STUDENT)/TESTPROG =5 BOJ ...
PD (FINANCE)/CHECKREG;	PD=(FINANCE)/CHECKREG END PD.
RE (FINANCE)/CHECKREG;	(FINANCE)/CHECKREG NOT REMOVED- SECURITY ERROR END REMOVE.
US FINANCE/VP REMOVE CHECKREG;	CHECKREG REMOVED END REMOVE.

File Security System

The file security system in the MCP is a mechanism for securing files secured against accidental or deliberate misuse. For example, a secured file cannot be listed, removed, or changed by an unauthorized user. A secured file is identified by the existence of the left and right parentheses "( )" characters enclosing the first name.

Example:

(PAYROLL)/<file-name>

A first name enclosed in the left and right parentheses "( )" characters, such as (PAYROLL), is called the usercode. Rules exist for creating and accessing files having usercodes. Before files having usercodes can be created, a set of valid usercodes must be defined for the MCP. This is done with the SYSTEM/MAKEUSER program. The SYSTEM/MAKEUSER program creates a file on the SYSTEM disk called (SYSTEM)/USERCODE. The (SYSTEM)/USERCODE file contains all the valid usercode/password combinations that are allowed access to secured files.

The usercode allows a convenient way of naming and grouping sets of disk files. The password authorizes entry into the system.

File security is independent of terminal users and data communications. Thus, the usercode/password combination can be specified through the card reader, ODT, or remote terminals. The following discussion on file security is only in the context of batch processing.

File Security - Batch Processing

By executing the SYSTEM/MAKEUSER program, the (SYSTEM)/USERCODE file can be created or modified. Refer to the B 1000 Systems System Software Operation Guide, Volume 2, for a complete description of the operation of the SYSTEM/MAKEUSER program. The (SYSTEM)/USERCODE file contains information on all the valid usercode/password combinations, including the default packs, priority, and security information. This file is only accessed by the SYSTEM/MAKEUSER program and the MCP. Consequently, all access to the (SYSTEM)/USERCODE file can be prevented if the SYSTEM/ MAKEUSER program is not stored on the SYSTEM or user disk.

After the (SYSTEM)/USERCODE file is created, the next step in creating secured files is the execution of a program with USER <usercode>/<password> prefixing the EXECUTE command.

Example:

    USER PAYROLL/ACCT EXECUTE CHECK/WRITER

In this example, the MCP executes the CHECK/WRITER program and uses PAYROLL/ACCT as the usercode/password combination.

Operation of File Security System

The following paragraphs describe the operation of the file security system on the B 1000 computer system. In the examples, assume that the CHECK/WRITER program is executed with the USER PAYROLL/ACCT prefixing the EXECUTE command.

Control commands that are zipped by programs or entered through the card reader must be prefixed by a USER command with the appropriate usercode/password combination if the commands access secured files. Refer to the respective B 1000 language manuals for the syntax of the ZIP command.

Example 1:

The CHECK/WRITER program opens a new disk file labeled CHECKS, writes records into the file, and then closes it with LOCK (RELEASE in COBOL, SAVE IN COBOL74) file attribute. The file is entered in the disk directory. The MCP places into the disk directory the (PAYROLL)/CHECKS file name. The (PAYROLL)/CHECKS file is secured and can only be accessed by programs that are executed with the USER PAYROLL/<password> prefixing the EXECUTE command. When performing library maintenance commands (ADD, COPY, CHANGE, or REMOVE on this file, the command must be preceded by USER PAYROLL/<password>. The following are valid library maintenance commands for the (PAYROLL)/CHECKS files.

    USER PAYROLL/ACCT RE CHECKS;
    USER PAYROLL/ACCT CH CHECKS TO PAYCHECKS;
    USER PAYROLL/ACCT COPY = FROM DISK TO BACKUP (KIND=TAPE);

The first command removes the (PAYROLL)/CHECKS file. The second command changes the file name from (PAYROLL)/CHECKS to (PAYROLL)/PAYCHECKS. The third command copies all the files with the (PAYROLL) first name, that is, (PAYROLL)/=, to a library tape labeled BACKUP. The COPY command causes the SYSTEM/COPY program to be executed.

The following commands can cause unexpected results.

    RE CHECKS;
    RE (PAYROLL)/CHECKS;
    PD CHECKS;

In the first command, the MCP cannot find the (PAYROLL)/CHECKS file and, therefore, does not remove the file. If the CHECKS file exists on disk, it is removed. The second command is rejected by the MCP because the command requested the removal of a secured file. In the third command, the MCP cannot find the (PAYROLL)/CHECKS file, and if the CHECKS file exists on disk, it is displayed as being in the disk directory.

Example 2:

If another program is executed without the PAYROLL usercode (either a different usercode or no usercode) and it attempts to access the (PAYROLL)/CHECKS file, the MCP disallows the request.

Example 3:

If the user wishes the secured file to be accessed by other usercode/password combinations, the file must be designated as a PUBLIC file. In the previous examples, the (PAYROLL)/CHECKS file is created as a PRIVATE file by default and no unauthorized user can access it. If the (PAYROLL)/CHECKS file is a PUBLIC file, then any program executed with a different usercode/password combination or no usercode can access this file by referencing the full file name (PAYROLL)/CHECKS.

When a program attempts to open this file with the INPUT or INPUT/OUTPUT file attributes, the MCP checks to see if the file is a PUBLIC file, and if it is, opens it. The program can read from the file, write (if opened with INPUT/OUTPUT) to the file, and then close the file. The (PAYROLL)/CHECKS file then contains all updates made to it by the program.

Example 4:

The following are three ways of designating the security type, PUBLIC or PRIVATE, for a file.

1. Specify SECURITYTYPE = PUBLIC, SECURITYTYPE = PRIVATE, and SECURITYTYPE = DEFAULT in the FILE program attribute at execution time. The following example shows the use of the SECURITYTYPE file attribute.

   USER PAYROLL/ACCT EXECUTE CHECK/WRITER;
   FILE CHECKS SECURITYTYPE = <security>;

   <security> can be the DEFAULT, PUBLIC, or PRIVATE keywords. The DEFAULT keyword specifies that the security type defined in the (SYSTEM)/USERCODE file is to be used.

2. After a file is created and locked in the disk directory, its security type can be changed by modifying the disk file header using the MH (Modify Header) system command. The following example shows the use of the MH system command to change the security type of the (PAYROLL)/CHECKS file.

   USER PAYROLL/ACCT MH CHECKS SEC <security>;

   <security> can be the PUBLIC or PRIVATE keywords.

3. The SECURITY system command can also be used to change the file security attributes. The following example shows the use of the SECURITY system command to change the security type of the (PAYROLL)/CHECKS file.

   USER PAYROLL/ACCT SECURITY CHECKS <security>;

   <security> can be the PUBLIC or PRIVATE keywords.

4. The SYSTEM/MAKEUSER program has an option that causes all files created by a specific usercode to be PUBLIC files. When creating the (SYSTEM)/USERCODE file, the PUBLIC keyword can be specified for any usercode/password combination. If the usercode/password combination is PUBLIC, then the MCP makes every file created by the usercode/password combination a PUBLIC file. If the PUBLIC keyword is not specified when the usercode/password combination is created, the default security type is PRIVATE.

   The only programming languages available on the B 1000 computer system that allow files to be designated as PUBLIC or PRIVATE, are COBOL74 and COBOL74B. File declarations by other compilers specify DEFAULT for the security type for the usercode/password combination in the (SYSTEM)/USERCODE file. This default can be changed by the FILE attribute statement.

Example 5:

If a file is designated as a PUBLIC file, the creator of that file has the option of controlling the type of input/output (I/O) access that another user can perform (INPUT, OUTPUT, INPUT/OUTPUT) on that file. If the (PAYROLL)/CHECKS file is a PUBLIC read-only (INPUT) file, a program running under another usercode/password combination or no usercode can read the file but cannot write to it. Three ways of specifying the allowable I/O access are described next.

1. Specify the SECURITYUSE file attribute in the FILE program attribute in the EXECUTE command. The following example shows the use of the SECURITYUSE file attribute.

   USER PAYROLL/ACCT EXECUTE CHECK/WRITER; FILE CHECKS SECURITYUSE <access>;

   <access> can be the INPUT, OUTPUT, or I.O keywords, and specifies read-only, write-only, or read-write, respectively.

2. The MH (Modify Header) system command can be used to change the I/O access of a file. The following example shows the use of the MH system command to change the I/O access of the (PAYROLL)/CHECKS file.

   USER PAYROLL/ACCT MH CHECKS SUS <access>;

   <access> can be the INPUT, OUTPUT, or I.O keywords and specifies read-only, write-only, and read-write, respectively.

3. The SECURITY system command changes the I/O access of a file. The following example shows the use of the SECURITY system command to change the I/O access of the (PAYROLL)/CHECKS file.

   USER PAYROLL/ACCT SECURITY CHECKS PUBLIC <access>; USER PAYROLL/ACCT SECURITY CHECKS PRIVATE <access>;

   <access> can be the IN, OUT, or IO keywords and specifies read-only, write-only, and read-write, respectively.

Example 6:

If the file security mechanism on the B 1000 computer system is not desired, all programs can be run without USER <usercode/password> prefixing the MCP commands with no noticeable impact. The (SYSTEM)/USERCODE file is not needed and is never accessed by the MCP. The following two restrictions apply when the file security mechanism is not used.

1. The first name portion of a file name cannot be enclosed within the parentheses "( )" characters. A first name enclosed in the parentheses characters is assumed to be a usercode by the MCP.
2. The first name cannot begin with an asterisk (*) character. The use of the asterisk convention with file security is described in examples 7 and 8.

Example 7:

If a program is executed with the USER <usercode/password> prefixing the EXECUTE command and the program accesses a non-secured file that does not have a usercode as the first name, the following two conditions apply:

1. Existing files on disk having two names can be accessed by a program running under a usercode by specifying the exact title of the file. If a program running under a usercode attempts to close a new file with the LOCK file attribute set and the file has two names, the MCP does not enter the file in the disk directory. The file is not entered in the disk directory because the first name portion of the file name is used by the MCP for storing the usercode. Programs that create two-name files must be modified to use single file names if the program is executed with the USER <usercode>/<password> prefixing the EXECUTE command.

   The CHECK/WRITER program can open the two-name NEW/INFO file as an output file, but this file cannot be closed and entered into the disk directory. No naming conflicts exist if the file is never locked in the disk directory. If the CHECK/WRITER program closes the file and desires to reopen it to access the records previously written, the CHECK/WRITER program must close the file without specifying any CLOSE options. The CHECK/WRITER program goes to end of job and the NEW/INFO file was not closed by the program, the NEW/INFO file is closed by the MCP and is not entered in the disk directory.

2. If the CHECK/WRITER program attempts to access an existing disk file labeled PAYABLES, the MCP first finds the file labeled (PAYROLL)/PAYABLES in the disk directory. If the (PAYROLL)/PAYABLES file is not in the disk directory, the MCP next searches for a file labeled PAYABLES. If the CHECK/WRITER program needs to access the PAYABLES file, it is possible only if there is no file in the disk directory labeled (PAYROLL)/PAYABLES.

   If the CHECK/WRITER program declares the file name *PAYABLES, the MCP does not modify the file name in any way and searches for the single-name file labeled PAYABLES. The CHECK/WRITER program can read and/or write this file and, when it is closed, the file name remains unchanged.

   A program executed with USER <usercode>/<password> prefixing the EXECUTE command cannot create a file with a single file name. The MCP prefixes such output file names with the usercode.

Example 8:

The SYSTEM/MAKEUSER program associates a default pack identifier with any usercode/password combination, subject to the condition that all like usercodes in the (SYSTEM)/USERCODE file must have the same pack identifier and security type (PUBLIC or PRIVATE), but different passwords.

If the pack identifier specified in the program file declaration is blank, the file is automatically directed to the user disk specified by the usercode entry in the (SYSTEM)/USERCODE file. If a pack identifier is included in the file declaration, it overrides the default pack identifier specified in the (SYSTEM)/USERCODE file. The following example illustrates this.

```
USER PAYROLL/ACCT EXECUTE CHECK/WRITER;
FILE CHECKS PACK.ID PAYR;
```

In this example, the MCP directs the file labeled CHECKS to the user disk labeled PAYR, creating a file labeled PAYR/(PAYROLL)/CHECKS, irrespective of the default pack identifier contained in the (SYSTEM)/USERCODE file. If a default pack identifier of BACKUP is contained in the (SYSTEM)/USERCODE file and the CHECK/WRITER program is executed without the FILE program attribute specified in the EXECUTE command (the user disk name in the CHECKS file is blank), the MCP directs the file to the default user disk labeled BACKUP with the resulting name of BACKUP/(PAYROLL)/CHECKS.

If a default pack identifier is specified in the (SYSTEM)/USERCODE file and it is necessary to create the file on the SYSTEM disk, then a pack name of DISK must be supplied.

```
USER PAYROLL/ACCT EXECUTE CHECK/WRITER;
FILE CHECKS NAME DISK/(PAYROLL)/CHECKS;
```

Whenever the MCP detects an asterisk (*) character in the first position of the declared first name, the MCP deletes the asterisk (*) character and uses the resulting file name without further modification.

Example 9:

There are programs, such as Message Control Systems (MCS) and utility programs, that need to access and create files with any usercode. To permit this, a usercode/password combination can be defined in the (SYSTEM)/USERCODE file as a privileged (*PRIV) usercode.

The following declared and actual file names assume that (PAYROLL) is a privileged usercode with a default pack identifier of PAYR, and the usercode (LEDGER) is a non-privileged usercode with a default pack identifier of LEDG. If the CHECK/WRITER program attempts to create a new file, the MCP modifies the file name as in Table D-1.

Table D-1. File Names Created by the CHECK/WRITER Program.

Declared File Name	Actual File Name Used by the MCP
CHECKS	PAYR/(PAYROLL)/CHECKS
*CHECKS	PAYR/CHECKS/
CHECKS/PAYCHECK	PAYR/CHECKS/PAYCHECK
*CHECKS/PAYCHECK	PAYR/CHECKS/PAYCHECK
(LEDGER)/CHECKS	LEDG/(LEDGER)/CHECKS
DISK/(LEDGER)/CHECKS	DISK/(LEDGER)/CHECKS
PAYR/CHECKS/PAYCHECK	PAYR/CHECKS/PAYCHECK

If the CHECK/WRITER program attempts to access an existing file, the MCP uses the actual file name as shown the Table D-2.

Table D-2. Actual File Names Used by the MCP

Declared File Name	Actual File Name Used by the MCP
CHECKS	PAYR/(PAYROLL)/CHECKS
CHECKS/PAYCHECK	PAYR/CHECKS/PAYCHECK

All other cases of accessing existing files function the same as shown in Table D-1 for creating new files.

Non-Privileged Usercode Handling

Non-privileged usercodes are restricted in the file names that can be accessed. The following examples assume that the usercode (PAYROLL) is a non-privileged usercode with a default pack identifier of PAYR.

Example 1:

If the CHECK/WRITER program attempts to create a new file, the MCP modifies the file name as shown in Table D-3.

Table D-3. Actual File Names Used When Creating a New File

Declared File Name	Actual File Name Used by the MCP
CHECKS	PAYR/(PAYROLL)/CHECKS
DISK/(PAYROLL)/CHECKS	DISK/(PAYROLL)/CHECKS

If the CHECK/WRITER program attempts to access an existing file, The MCP modifies the file name as shown in Table D-4.

Table D-4. File Names Used When Accessing an Existing File

Declared File Name	Actual File Name Used by the MCP	
CHECKS	PAYR/(PAYROLL)/CHECKS	
*CHECKS	PAYR/CHECKS/	(see NOTE)
CHECKS/PAYCHECK	PAYR/CHECKS/PAYCHECK	(see NOTE)
DISK/CHECKS/PAYCHECK	DISK/CHECKS/PAYCHECK	(see NOTE)
(PAYROLL)/CHECKS	PAYR/(PAYROLL)/CHECKS	
DISK/(PAYROLL)/CHECKS	DISK/(PAYROLL)/CHECKS	
BACKUP/(PAYROLL)/CHECKS	BACKUP/(PAYROLL)/CHECKS	
(LEDGER)/CHECKS	LEDG/(LEDGER)/CHECKS	(see NOTE)
DISK/(LEDGER)/CHECKS	DISK/(LEDGER)/CHECKS	(see NOTE)

NOTE

Access is granted only if the file is a PUBLIC file and the SECURITYUSE <access> matches the open type.

Example 2:

If a program is executed with the USER <usercode>/<password> prefixing the EXECUTE command and then zips a control command to the MCP, the MCP automatically prefixes the control command with USER <usercode>/<password> of the zipping program. For example, ZIP "RE (LEDGER)/CHECKS;" is interpreted by the MCP as USER PAYROLL/ACCT RE (LEDGER)/CHECKS and is not allowed unless the usercode (PAYROLL) is a privileged usercode.

If the zipping program includes USER <usercode>/<password> in the control command, the usercode/password combination overrides the combination added by the MCP. For example, ZIP USER LEDGER/FILE REMOVE CHECKS; removes the file, even if the usercode (PAYROLL) is non-privileged. This allows one non-privileged program to remove the files of another, but only if the correct usercode/password combination is known by the zipping program.

Example 3:

The usercode/password information must be prefixed to an ODT system command if the command results in the modification or removal of a secured disk file. The following system commands are affected by this rule.

CHANGE
COMPILE
EXECUTE
MH
MODIFY
QF
REMOVE

The following examples are of incorrect and correct system commands.

Incorrect Messages

EXECUTE (LEDGER)/XXX;

CHANGE (LEDGER)/A TO X;

USER LEDGER/FILE CHANGE A TO *X;

Correct Messages

USER LEDGER/FILE EXECUTE (LEDGER)/X;
or
USER LEDGER/FILE EXECUTE X;

USER LEDGER/FILE CHANGE A TO X;

USER SITE/X CHANGE (LEDGER)/A TO *X;
(if (SITE) is a privileged usercode)

Example 4:

Backup files created by programs executed with USER <usercode>/<password> prefixing the EXECUTE command have a naming convention that is different from the non-secured backup file naming convention. For example, backup files created by the CHECK/WRITER program have the following names, assuming a default backup pack identifier of PAYR.

Printer Backup	Punch Backup
PAYR/(PAYROLL)/PRT<integer>	PAYR/(PAYROLL)/PCH<integer>

To print, punch, remove, or display secured backup files, the PB, RB, and BF commands must be preceded by the appropriate USER <usercode>/<password>. The following examples include the system command and the action taken for secured backup files.

System Command	Action
USER PAYROLL/ACCT PB 15;	Prints PAYR/(PAYROLL)/PRT15 or Punches PAYR/(PAYROLL)/PCH15.
USER PAYROLL/ACCT BF PRT/=;	Displays all non-user named printer backup files on user disk PAYR with usercode (PAYROLL).
USER PAYROLL/ACCT RB =/=;	Removes all non-user named backup and dump files on user disk PAYR with usercode (PAYROLL).

Example 5:

The usercode/password convention is applicable to the ADD and COPY commands. For example, the command

USER PAYROLL/ACCT COPY = FROM PAYR(KIND=DISK) TO SYSTEM(KIND=TAPE);

copies (PAYROLL)/= from the user disk labeled PAYR to the library tape labeled SYSTEM.

Example 6:

Programs executed with USER <usercode>/<password> prefixing the EXECUTE command are also subject to the default pack identifier specified in the (SYSTEM)/USERCODE file. Assume that the default pack identifier for the usercode (PAYROLL) is PAYR, and then consider the following example.

USER PAYROLL/ACCT EXECUTE CHECK/WRITER;

The MCP first searches for the program file PAYR/CHECK/WRITER and, if found, executes it. If the program cannot be found on the default user disk, the SYSTEM disk is searched. If program files of the same name exist on both the default user disk and the SYSTEM disk, the file on the SYSTEM disk is never loaded. To overcome this restriction, a pack of DISK can be used as shown in the following example:

USER PAYROLL/ACCT EXECUTE DISK/CHECK/WRITER;

The same restrictions occur when the program being executed is identified by a single file name as shown in the following example.

USER PAYROLL/ACCT EXECUTE PAYCHECKS;

In this case, the following search sequence is followed:

PAYR/(PAYROLL)/PAYCHECKS
DISK/(PAYROLL)/PAYCHECKS
PAYR/PAYCHECKS/
DISK/PAYCHECKS/

APPENDIX E
NOTATION CONVENTIONS

The following paragraphs describe the notation conventions used in this manual.

Left and Right Brackets ([])

Left and right bracket characters enclose portions of a particular syntax that is not required.

Left and Right Broken Brackets (<>)

Left and right broken bracket characters enclose letters and digits that are supplied by the user. The letters and digits can represent a variable, a number, a file name, or a command.

Example:

<mix #>AX<command>

At Sign (@)

The at sign (@) character encloses hexadecimal information.

Example:

@F3@ is the hexadecimal representation of the EBCDIC character 3.

The at sign (@) character also encloses binary information when the initial @ character is followed by a (1).

Example:

@(1)11110011@ is the binary representation of the EBCDIC character 3.

Railroad Diagrams

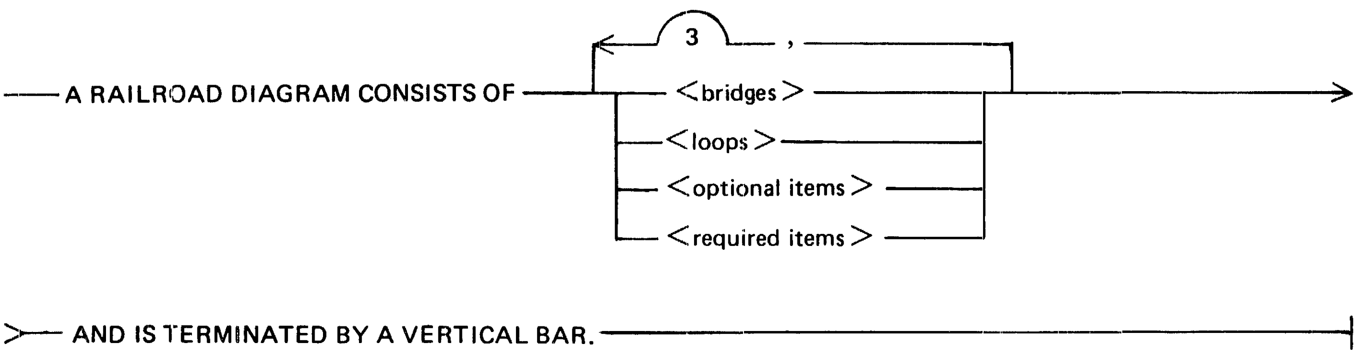
Railroad diagrams show how syntactically valid statements can be constructed.

Traversing a railroad diagram from left to right, or in the direction of the arrowheads, and adhering to the limits illustrated by bridges produces a syntactically valid statement. Continuation from one line of a diagram to another is represented by a right arrow (→) appearing at the end of the current line and beginning of the next line. The complete syntax diagram is terminated by a vertical bar (|).

Items contained in broken brackets (< >) are syntactic variables which are further defined, or require the user to supply the requested information.

Upper-case items must appear literally. Minimum abbreviations are underlined

Example:



G50051

The following syntactically valid statements can be constructed from the above diagram:

A RAILROAD DIAGRAM CONSISTS OF <bridges> AND IS TERMINATED BY A VERTICAL BAR.

A RAILROAD DIAGRAM CONSISTS OF <optional-items> AND IS TERMINATED BY A VERTICAL BAR.

A RAILROAD DIAGRAM CONSISTS OF <bridges>, <loops> AND IS TERMINATED BY A VERTICAL BAR.

A RAILROAD DIAGRAM CONSISTS OF <optional-items>, <required-items>, <bridges>, <loops> AND IS TERMINATED BY A VERTICAL BAR.

Required Items

No alternate path through the railroad diagram exists for required items or required punctuation.

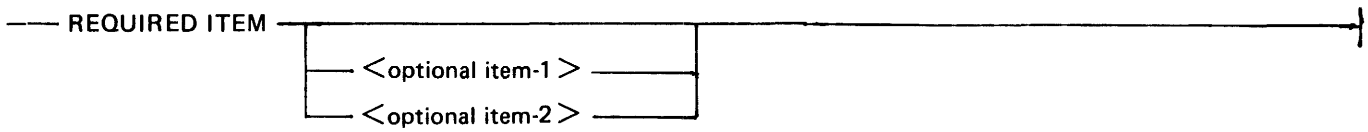
Example:

G50052

Optional Items

Items shown as a vertical list indicate that the user must make a choice of the items specified. An empty path through the list allows the optional item to be absent.

Example:



G50053

The following valid statements can be constructed from the above diagram:

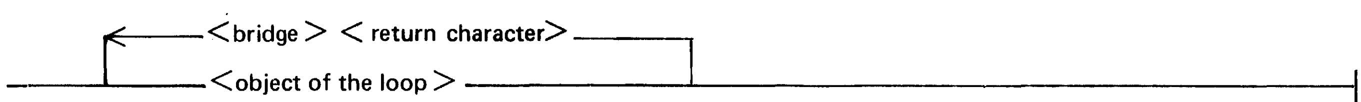
REQUIRED ITEM

REQUIRED ITEM <optional-item-1>

REQUIRED ITEM <optional-item-2>

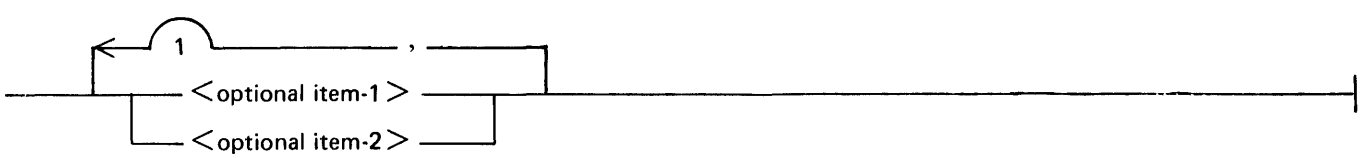
Loops

A loop is a recurrent path through a railroad diagram. A loop must be traversed in the direction of the arrowheads, and the limits specified by the bridges cannot be exceeded. A loop has the following format:



G50054

Example:



G50055

The following statements can be constructed from the previous railroad diagram:

<optional-item-1>

<optional-item-2>

<optional-item-1>,<optional-item-1>

<optional-item-1>,<optional-item-2>

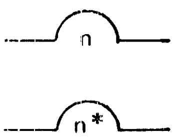
<optional-item-2>,<optional-item-1>

<optional-item-2>,<optional-item-2>

A loop must be traversed in the direction of the arrowheads, and the limits specified by bridges cannot be exceeded.

Bridges

A bridge indicates the minimum or maximum number of times a path can be traversed in a railroad diagram. There are two forms of bridges.

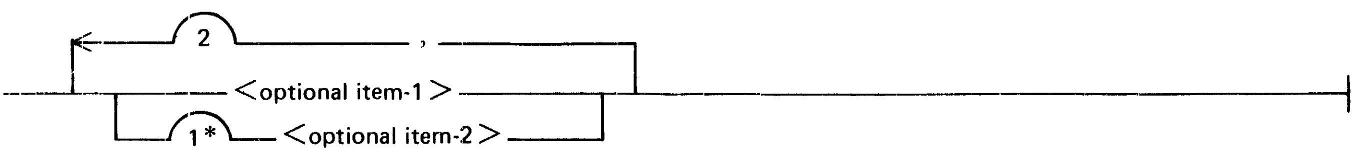


n is an integer which specifies the maximum number of times the path can be traversed.

n is an integer which specifies the minimum number of times the path must be traversed.

G50056

Example:



G50057

The loop can be traversed a maximum of two times; however, the path for <optional-item-2> must be traversed at least one time.

The following statements can be constructed from the previous railroad diagram:

<optional-item-2>

<optional-item-1>,<optional-item-2>

<optional-item-2>,<optional-item-2>,<optional-item-1>

<optional-item-2>,<optional-item-2>,<optional-item-2>

Words appearing in all upper-case letters are keywords and must appear as presented. Words in lower-case letters and embraced in left and right broken bracket characters are symbols for user-supplied words or values. Where keywords can be abbreviated, the abbreviation is denoted by the letters underlined in the keywords. Each keyword, keyword abbreviation, or user-supplied item must be delimited from another such word by at least a single space or by a special character. For example, the parentheses, comma, period, colon characters can be used as delimiters. Redundant spaces are ignored.

INDEX

Documentation Evaluation Form

Title: B 1000 Systems System Software Operations Guide, Volume 1 | Form No: 5024508
Date: September 1986

Burroughs Corporation is interested in receiving your comments and suggestions, regarding this manual. Comments will be utilized in ensuing revisions to improve this manual.

Please check type of Suggestion:

☐ Addition ☐ Deletion ☐ Revision ☐ Error

Comments:

From:

Name

Title

Company

Address

Phone Number Date

Remove form and mail to:

Burroughs Corporation
Documentation Dept., TIO - West
1300 John Reed Court
City of Industry, CA 91745
U.S.A.