

17329115 A



**MPX/OS VERSION 3
INSTALLATION HANDBOOK**

**CONTROL DATA®
MP-32
COMPUTER SYSTEMS**

LIST OF EFFECTIVE PAGES

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PREFACE

The MPX/OS Installation Handbook describes the release materials, the installation procedure for the MPX/OS operating system and its related product set, and the method of updating the system.

The user must have a working knowledge of the MPX/OS operating system, use of the COMPASS assembler, and use of the UPDATE program. The user should also be familiar with the prepare library (PRELIBOS) program.

The following Control Data Corporation documents contain information pertinent to this manual:

<u>Title</u>	<u>Pub. No.</u>
COMPASS Reference Manual	14061300
UPDATE Reference Manual	14351100
MPX/OS Operator's Guide	17329145
MPX/OS Reference Manual	17329125
PRELIBOS Reference Manual	14062200
UTILITY Reference Manual	14063800
MP-60 Emulation Reference Manual	17329120

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MPX/OS PRODUCT SET

The following MPX/OS products are included as standard products in the MPX/OS installation package:

MPX/OS operating system
COMPASS assembler
FORTRAN compiler
FORTRAN object routines
UPDATE source maintenance utility
PCC program command console
FMP file maintenance program
UTIL utility program
COPYL binary code editor
CATLIST file catalog lister
PRELIBOS library preparation
MASS microassembler
IESR FORTRAN interface routines
ED text editor
RATFOR FORTRAN preprocessor

RELEASE MATERIALS

The following release materials are supplied for MPX/OS and its product set.

- o SMD Formatter Flexible Disk
- o MP-60/30 Emulator Flexible Disk
- o Tape Boot Flexible Disk
- o MPX/OS Installation Tape
- o MPX/OS System Tape
- o Initial Files Tape
- o MPX/OS System PL UPDATE Tape
- o Product Set PL UPDATE Tapes
- o MPX/OS listings (includes Product Set)

SMD FORMATTER FLEXIBLE DISK

This flexible disk contains the firmware used to format an SMD for use by MPX/OS. Section 2 describes its use.

MP-60/30 EMULATOR FLEXIBLE DISK

This flexible disk contains the firmware for emulating the MP-60/30. Section 2 describes its use.

TAPE BOOT FLEXIBLE DISK

This flexible disk contains the firmware for the MPX/OS tape bootstrap program. Tape Boot reads from magnetic tape unit 0 and expects to find a tape written by PRELIBOS in absolutized format (generated by ABS module). Section 2 describes its use.

MPX/OS INSTALLATION TAPE

This magnetic tape contains an absolute record of the MPX/OS System Installation program. It is generated by the ABS module of PRELIBOS (refer to PRELIBOS Reference Manual).

MPX/OS SYSTEM TAPE

This magnetic tape contains the information necessary to install the MPX/OS system on the system mass storage device. Refer to the PRELIBOS Reference Manual for a description of the MPX/OS system tape. Section 2 describes the use of this tape.

INITIAL FILES TAPE

This magnetic tape contains the setup and job files needed by MPX/OS to setup interactive devices and to allow the installer to load additional files once the system has been deadstarted. Tape is in FMP format. Section 2 describes the use of this tape.

MPX/OS SYSTEM PL UPDATE TAPE (Release Tape 01)

The MPX/OS System PL UPDATE magnetic tape contains the source text in compressed UPDATE format for the MP-60/30 Emulator and the MPX/OS operating system. Tape itself is in FMP format. Refer to the UTILITY Reference Manual for a description of data retrieval from this tape. Section 3 describes the use of this tape.

PRODUCT SET PL UPDATE TAPES (Release Tapes 02 and 03)

The Product Set PL UPDATE magnetic tapes contain the source text in compressed UPDATE format for the product set. Tapes themselves are in FMP format. Refer to the UTILITY Reference Manual for a description of data retrieval from this tape. Section 3 describes the use of this tape.

SYSTEM LISTINGS

The release materials include the assemblies for every program on the system UPDATE tape, the output of the job that created the MPX-RESIDENT file and the MPX-LIBRARY file on the system tape, and the deck names from the system UPDATE tape.

HARDWARE CONFIGURATION

The system tape provided in the MPX/OS release materials is configured for the following hardware:

- 1 MP-32 Central Processing Unit
 - 65 to 512K 32-Bit Main Memory
- 1 Control Data 1867-2 Storage Module Disk Subsystem
(includes Controller and 50 mega-byte SMD drive)
- 1 Control Data 1811-1 Operator's Console
- 1 Control Data 2558-3 CYBER Channel Coupler
- 1 Control Data QSE 21877 Buffered Communications Line Adapter
(supports up to 16 asynchronous terminals)
- 5 Control Data QSE 21855 Micro-Programmable Communications Line Adapters
- 1 Control Data 1860-4 Magnetic Tape Subsystem
(includes Controller and 2 Magnetic Tape Transports)
- 1 Control Data 65109-19/1833-5 Flexible Disk Drive/Controller
- 1 Control Data 1827-60 Line Printer
- 1 Control Data 405/3447 Card Reader/Controller

The MPX/OS Installation Tape and the MPX/OS System tape are provided for installing the MPX/OS operating system. The system installation program provides a means of labeling mass storage devices and loading the MPX/OS system tape on the MPX/OS system device. To install the MPX/OS operating system, perform the following sequence of procedures:

- 1) Power-on processor, memory, and peripheral units (Appendix A).
- 2) Format SMD(s).
- 3) Load MP-60/30 Emulator firmware into MP-60 micromemory.
- 4) Load Tape Boot firmware into MP-60 micromemory.
- 5) Load System Installation program into MP-60 memory.
- 6) Execute System Installation program under operator control.
- 7) Reload MP-60/30 Emulator firmware for deadstart of MPX/OS operating system.

FORMATTING DISK PACK

Format disk pack with the SMD Formatter using the following procedure:

- 1) Mount disk pack to be formatted on Unit 0.
- 2) Load SMD Formatter flexible disk (Refer to MPX/OS Operator's Guide).
- 3) Press MASTER CLEAR.
- 4) Press DEADSTART.
- 5) The firmware is now loaded into micromemory and begins execution. When formatting of the disk is complete, the MICRORUN diode will be extinguished.

LOADING MP-60/30 EMULATOR FIRMWARE

Load MP-60 micromemory with the MP-60/30 Emulator firmware using the following procedure:

- 1) Load MP-60/30 Emulator flexible disk (Refer to MPX/OS Operator's Guide).
- 2) Press MASTER CLEAR.
- 3) Press DEADSTART.
- 4) The MP-60/30 Emulator is now loaded into micromemory. When load is complete, both the MICRORUN and MACRORUN diodes will be lit.

LOADING TAPE BOOT FIRMWARE

Load MP-60 micromemory with the Tape Boot firmware using the following procedure:

- 1) Load Tape Boot flexible disk (Refer to MPX/OS Operator's Guide).
- 2) Press MASTER CLEAR.
- 3) Press DEADSTART.
- 4) The Tape Boot firmware is now loaded into micromemory over the Deadstart portion of the Emulator. When load is complete both the MICRORUN and MACRORUN diodes will be lit.

LOADING SYSTEM INSTALLATION PROGRAM

Load MP-60 memory with the System Installation program using the following procedure:

- 1) Mount and ready the MPX/OS Installation tape on tape unit 0.
- 2) Press MASTER CLEAR
- 3) Press sequence of ESC, I, @ on keys of Operator Console.
- 4) The MPX/OS Installation program is now loaded into memory. Load is complete once the tape begins to be rewound.

EXECUTING SYSTEM INSTALLATION

The MPX/OS Installation program requires operator interaction at the console CRT in order to perform two general functions:

- o System device labeling
- o System device loading

SYSTEM DEVICE LABELING

The MPX/OS Installation program writes a device label on the system device and creates a label file with enough space for the requested file labels. The following is an example of the console interaction required to label the system device.

<u>Message</u>	<u>Action</u>
ENTER COMMAND FORMAT, F LABEL, LB LOAD, LD RESTART, RS	Type in code letters LB for a device label and press ETX or Carriage Return.
ENTER DEVICE IDENTIFIER XXXXXXXX, 1-8 ALPHANUMERIC CHARACTERS	Type in predetermined device identifier and press ETX or Carriage Return.
ENTER DEVICE TYPE DT=1, 9425 DT=2, 844 DT=3, 9427 DT=4, 1867-10 DT=5, 1867-20 DT=10, 858	Type in number (1, 2, 3, 4, or 5) for system disk device and press ETX or Carriage Return.
ENTER UNIT NUMBER FOR DEVICE N, 1 NUMERIC CHARACTER	Type a number (0-7) for device unit and press ETX or Carriage Return.
SYSTEM DEVICE Y, DEVICE IS SYSTEM DEVICE N, DEVICE IS NOT SYSTEM DEVICE	Type in a letter (Y or N) to specify whether it is a system or non-system device and press ETX or Carriage Return.
NUMBER OF LABELS IN LABEL FILE NNNN, 3-4 NUMERIC CHARACTERS (MIN=100)	Type a number (100-9999) for number of labels and press ETX or Carriage Return.

Message

Action

READY DEVICE
PRESS CARRIAGE RETURN TO
CONTINUE

Press ETX or Carriage Return.

The installation program writes a device label on the system device. (NOTE: If additional SMDs exist in the configuration, the above console interaction is then repeated for each device, with each being labeled as a non-system device). Console interaction then continues by executing the procedure to load the system device.

SYSTEM DEVICE LOADING

The following is an example of the console interaction required to load the system device. Mount the MPX/OS System tape on tape unit 0.

Message

Action

ENTER COMMAND
FORMAT, F
LABEL, LB
LOAD, LD
RESTART, RS

Type in code letters LD to load the system device and press ETX or Carriage Return.

ENTER UNIT NUMBER FOR TAPE
N, 1 NUMERIC CHARACTER

Type in a number (0-7) for tape unit and press ETX or Carriage Return.

ENTER MPX-RESIDENT FILE
EDITION NUMBER
XX, 1 OR 2 ALPHANUMERIC
CHARACTERS

Type in a predetermined 2-character code for the resident file and press ETX or Carriage Return.

ENTER MPX-LIBRARY FILE
EDITION NUMBER
XX, 1 OR 2 ALPHANUMERIC
CHARACTERS

Type in a predetermined 2-character code for the library file and press ETX or Carriage Return.

READY LOAD TAPE
PRESS CARRIAGE RETURN TO
CONTINUE

Once the load tape is mounted and ready press ETX or Carriage Return.

The MPX/OS Installation program will now transfer the information from the MPX/OS System tape to the system device. When completed, console interaction continues in order to determine if files are to be loaded from an additional tape (created using FMP):

<u>Message</u>	<u>Action</u>
LOAD FMP FILES (Y/N)?	Type in a letter (Y or N) to specify whether or not files are to be loaded from an FMP tape and press ETX or Carriage Return.

If answer is N, no files will be loaded and processing will skip to the summary information display. Otherwise, console interaction continues:

<u>Message</u>	<u>Action</u>
READY LOAD TAPE PRESS CARRIAGE RETURN TO CONTINUE	Once the FMP load tape is mounted and ready press ETX or Carriage Return.

The contents of the FMP load tape will now be loaded by the MPX/OS Installation program.

Once all tape loading is complete, the following summary information is displayed:

<u>File</u>	<u>Disk Address</u>	<u>Checksum Error</u>
MP-60 EMULATOR	00000043	NO (or YES)
MPX-BOOT	00000085	NO (or YES)
LABEL FILE	00000	
MPX-RESIDENT	00000	NO (or YES)
MPX-LIBRARY	00000	NO (or YES)

INSTALL COMPLETE

If no errors occurred during installation, the operating system may be initialized by re-loading the MP-60/30 Emulator firmware and following the procedure described in the Operator's Guide. Table 2-1 lists the possible errors that may occur during installation.

TABLE 2-1. INSTALLATION ERROR MESSAGES

Message	Description	Action
<p>ILLEGAL COMMAND XXXXXXXX PRESS CARRIAGE RETURN TO CONTINUE</p> <p>LOAD TAPE IS NOT SYSTEM TAPE MOUNT SYSTEM TAPE PRESS CARRIAGE RETURN TO CONTINUE</p> <p>NO SYSTEM DEVICE PRESS CARRIAGE RETURN TO CONTINUE</p> <p>DISK ADAPTER ERROR ... PRESS CR TO START OVER</p> <p>PARITY ERROR ON TAPE</p> <p>READY DEVICE PRESS CARRIAGE RETURN TO CONTINUE</p> <p>READY LOAD TAPE PRESS CARRIAGE RETURN TO CONTINUE</p> <p>REJECTED SIO AT XXXX</p> <p>TAPE BUSY OR NOT READY PRESS CARRIAGE RETURN TO CONTINUE</p>	<p>System install received an illegal command XXXXXXXX</p> <p>Load tape was not an MPX/OS PRELIBOS generated system tape</p> <p>LOAD command input, but no system device has been labeled</p> <p>A hardware error has occurred on the disk adapter or disk drive</p> <p>Parity error on load tape</p> <p>SIO command at address XXXXX rejected</p>	<p>Press CARRIAGE RETURN</p> <p>Mount system tape and press CARRIAGE RETURN</p> <p>Press CARRIAGE RETURN</p> <p>Consult Customer Engineer or press CARRIAGE RETURN</p> <p>Rerun system install with new load tape</p> <p>Ready mass storage device to be labeled, press CARRIAGE RETURN</p> <p>Ready tape to be loaded, press CARRIAGE RETURN</p> <p>Consult systems analyst</p> <p>Press CARRIAGE RETURN</p>

Modifications to the system may be necessary for purposes such as:

- o Installing PSRs
- o Adding tape units to the system
- o Adding mass storage units to the system
- o Expanding file tables
- o Changing default scratch file expansion limits
- o Changing default time limit
- o Changing default main memory scheduled
- o Changing the FMP access code (refer to Utility Reference Manual).
- o Changing system priorities

The PRELIBOS program provides the facility for modifying the system. PRELIBOS performs the following functions:

- 1) Builds an absolute record of the MP-60 emulator program and copies it to the primary system device, destroying the previous copy.
- 2) Builds an absolute record of the MPX/OS boot program and copies it to the primary system device, destroying the previous copy.
- 3) Builds an absolute record of the MPX/OS resident program and copies it to a user specified edition of an MPX-RESIDENT file.
- 4) Creates a new library, writing the library to a user specified edition of an MPX-LIBRARY file. LIBRARY modules that are self contained, such as FTN, may be placed on the library in absolute format.

Official modifications to the MPX/OS V3 and the MP-32 PRODUCT SET software are released via the Systems Technology Division PSR Summaries. Summaries are available from the PSR Coordinator, Systems Technology Division, Control Data Corporation, Sunnyvale, CA.

Contained in ownernames EMLB, SYSB, LIBB, CMPB, FTNB, MSTB, Z80B, STDB and SMFG are job files each called BLD-PLAN.RUN. When these files are executed, the output produces a MP-32 MPX/OS V3 CONSTRUCTION NOTEBOOK. The first page or pages of each section of the notebook provide an overview of the process used to re-construct the products included in the files having that particular ownername.

A convention has been established for the naming of the files involved in the re-construction process. The 14 character portion of the MPX/OS filename always includes a suffix which follows a period (.). The suffix is 2 or 3 characters long and is taken from the following set:

- .pl - UPDATE Program Library
- .bld - A job used to build a product or portion of a product
- .rel - A relocatable binary
- .abs - An absolute binary
- .dsm - Deadstart Microcode
- .run - A job used to copy information or produce a file
- .inc - Ratfor Include text
- .doc - Documentation

The period which precedes the suffix is the only period allowed in the filename.

Because of the 14 character limitation, additional naming rules are necessary:

- o Oldpl names must be 3 characters or less.
- o Product names must be 6 characters or less, or use an alias which is 6 characters or less (ex: COPYSBF vs CPYSBF).

As a product is re-constructed, the process moves through files having 3 ownernames. The jobs that create Oldpls with various modifications (GSD PSRs, STD PSRs, and LOCAL mods) are found in ownername XXX0 where XXX is one of the product groups. The intermediate Oldpls are placed in the XXX0 ownername, but the final result of the XXX0 jobs is an Oldpl which is placed in the XXXB ownername. The products are built from this "LOCAL" Oldpl.

The .bld jobs which produce the product binaries are found in the XXXB ownername. The relocatable binaries produced are placed in a common ownername; usually LBLD, but also LCDC.

The LBLD (or LCDC) ownername contains product relocatables, jobs that produce product absolutes, and a job to produce an MPX/OS Library.

The re-construction process is split across ownernames so that individual operations may be carried out without loading all the files necessary to accomplish all operations. For example, if COPYCF must be modified, only ownername MSTB need be loaded. When the modification is complete and tested, then ownername LBLD and LCDC are loaded, a new absolute is made and a new Library created. If the modification is to be included in the LOCAL Oldpl, then MSB0 would be loaded and the appropriate jobs run.

The following chart relates the various products to the ownernames where they reside:

<u>PRODUCT</u>	<u>PL OWNERNAME</u>	<u>BUILD OWNERNAME</u>	<u>BINARY OWNERNAME</u>
UDISKFMTR	EML0	EMLB	EMLB / Floppy
EMULATOR	EML0	EMLB	EMLB / Floppy / SMD
TAPEBOOT	EML0	EMLB	EMLB / Floppy
QWIKSTART	EML0	EMLB	EMLB / Floppy
MPX-RESIDENT	SYS0	SYSB	SYSB / MPXR
BLKDEBLK	SYS0	SYSB	LBLD / MPXL
TASKMON	SYS0	SYSB	LBLD / MPXL
MPXBOOT	SYS0	SYSB	SYSB / SMD
INSTALL	SYS0	SYSB	SYSB / Tape
DUMPSYS		SYSB	SMD, MPXR & MPXL / Tape
DSKUTIL	SYS0	SYSB	SYSB / Tape
FMPTAPE		SYSB	JOBS, FJOB, MPXS / Tape
CATLIST	LIB0	LIBB	LBLD / MPXL
COPYL	LIB0	LIBB	LBLD / MPXL
COSY	LIB0	LIBB	LBLD / MPXL
FMP	LIB0	LIBB	LBLD / MPXL
PCC	LIB0	LIBB	LBLD / MPXL
PRELIB	LIB0	LIBB	LBLD / MPXL
UTIL	LIB0	LIBB	LBLD / MPXL
UPDATE	LIB0	LIBB	LBLD / MPXL
CMP	CMPO	CMPB	LBLD / MPXL
COMPASS	CMPO	CMPB	LBLD
FTN	FTNO	FTNB	LBLD / MPXL
IPL	FTNO	FTNB	LBLD / MPXL
FTNCMP	FTNO	FTNB	LBLD / MPXL
RUNTIME	FTNO	FTNB	LBLD / MPXL
SPCL	FTNO	FTNB	LBLD / MPXL
COPYCF	MST0	MSTB	LBLD / MPXL
COPYSCF	MST0	MSTB	LBLD / MPXL
SYSDUMP	MST0	MSTB	MPXA
TDUMP	MST0	MSTB	LBLD / MPXL
ED	MST0	MSTB	LBLD / MPXL
EDI	MST0	MSTB	LBLD / MPXL
RATFOR	MST0	MSTB	LBLD / MPXL
MASS	MST0	MSTB	LBLD / MPXL
REF. MAN.	MST0	MSTB	na
Z80ASM	Z800	Z80B	LBLD / MPXL
Z80LDR	Z800	Z80B	LBLD / MPXL

<u>PRODUCT</u>	<u>PL OWNERNAME</u>	<u>BUILD OWNERNAME</u>	<u>BINARY OWNERNAME</u>
STLIB	STDO	STDB	BCDC
STPRM	STDO	STDB	BCDC
FMT	STDO	STDB	LCDC / MPXL
MAIL	STDO	STDB	BCDC
XREFUP	STDO	STDB	LCDC / MPXL
ITEMIZE	STDO	STDB	LCDC / MPXL
LISTF	STDO	STDB	LCDC / MPXL
ZAP	STDO	STDB	LCDC / MPXL
DAYERR	STDO	STDB	BCDC
FMAINT	STDO	STDB	BCDC
TCYB	STDO	STDB	BCDC
REF. MAN.	STDO	STDB	na

It is suggested that the person responsible for maintenance of this system at a site create a "system-build" SMD disk pack and load release tapes 01, 02 and 03 on the pack. Then each ownername should be dumped to its own mini-tape. Then, when a particular product is to be modified, its ownername can be loaded on the production system, the mods checked out, and then moved back to the "build" pack for long-term storage.

ASSEMBLY OPTIONS FOR SITE COMDECK

If changes are made to these options, all MPX/OS resident routines which call the SITE comdeck must be reassembled and the resident rebuilt.

System Debug Option

Definition: This option turns code to trace the path which the system takes to perform a given function request. This option should normally be turned off since it adds considerable overhead to the system. It is used as a debugging tool for system checkout.

Option: DEBUG SET n

Dependency: None.

Release value: 1

Defined values: 0 = on 1 = off

Task Timing Option

Definition: This option determines the method used by the operating system to accumulate CPU time for jobs currently running in the system.

Option: TIMING SET n

Dependency: None.

Release value: 0

Defined values: 0 = read the real-time clock on each entry/exit to/from program state and accumulate that time interval to the task (job) in execution.

1 = accumulate 50 milliseconds for task currently in execution on each real-time clock interrupt.

The value 0 adds system overhead but is more accurate in terms of actual job time.

Number of CPUs

Definition: This option defines the number of CPUs in the configuration.

Option: CPUSZ SET n

Dependency: Must be less than or equal to actual hardware configuration.

Release value: 1

Defined values: Value must be between 1 and 5.

Number of Card Readers

Definition: This option defines the number of card readers in the configuration.

Option: READERS SET n

Dependency: Must be less than or equal to actual hardware configuration.

Release value: 0

Defined values: Value must be between 0 and 1.

Number of Line Printers

Definition: This option defines the number of line printers in the configuration.

Option: PRINTERS SET n

Dependency: Must be less than or equal to actual hardware configuration.

Release value: 1

Defined values: Value must be between 0 and 2.

Number of Card Punches

Definition: This option defines the number of card punches in the configuration.

Option: PUNCHES SET n

Dependency: Must be less than or equal to actual hardware configuration.

Release value: 0

Defined values: Value must be between 0 and 1.

CPU Hardware

Definition: This option defines the type of CPU hardware

Option: MPP.SYS SET n

Dependency: Must correspond to actual hardware.

Release value: 1

Defined values: 0 = MP60 1 = MP-32

Code Conversion on Card Reader

Definition: This option determines the code conversion default for input from the card reader.

Option: CRCODE SET n

Dependency: None.

Release value: 2

Defined values: 0 = no code conversion default.
1 = Code conversion default is 029.
2 = Code conversion default is 026.

System Security Type

Definition: This option determines the basis of security checking that the system will perform.

Option: SECURITY SET n

Dependency: None.

Release value: 0

Defined values: 0 = Levels
1 = Compartmental

ASSEMBLY OPTIONS FOR LOWMEM DECK

Job Security

Definition: The security option sets the default security level for a job.

Option: JSCRYDF EQU n Default Job Security

Dependency: Value must be of type specified by SECURITY option. For Level, must be between 0 and 7. For Compartmental, mask must have value between \$00 and \$FF.

Release value: 0

Job Time Limit

Definition: The time limit option sets the default time limit for job execution in milliseconds of CPU time.

Option: JTLDF EQU n Default time limit

Dependency: None.

Release value: 60000 (1 minute)

Job Scheduled Memory

Definition: The scheduled memory option defines the default number of pages of main memory reserved for the job. One page equals 4K of memory.

Option: JSMEMDF EQU n Default scheduled memory

Dependency: Must be no greater than 16 pages.

Release value: 5

Job Print Line Limit

Definition: The line limit option sets the default limit for the number of lines printed for a job.

Option: JPLDF EQU n Default print lines

Dependency: None.

Release value: 1000

Job Punch Card Limit

Definition: The card punch limit option sets the default limit for the number of cards punched for a job.

Option: JPCDF EQU n Default punch cards

Dependency: None.

Release value: 0

Job Scratch Limit

Definition: The scratch limit option sets the default limit for the number of mass storage segments used for scratch area by the job.

Option: JSCRLDF EQU n Default Scratch Limit

Dependency: None.

Release value: 10

Job Priority

Definition: Defines the default priority at which a job will execute.

Option: JDPRTY EQU n Default Job Priority

Dependency: TLOWPR JDPRTY THIGHPR. The value should be kept at the low end of this range.

Release value: 16

Minimum Non-real-time Priority

Definition: This option defines the lower limit for priorities which a non-real-time task can obtain.

Option: TLOWPR EQU n Minimum Non-real-time Priority

Dependency: Must be less than THIGHPR.

Release value: 10

Maximum Non-real-time Priority

Definition: This option defines the upper limit for priorities which a non-real-time task can obtain.

Option: THIGHPR EQU n Maximum Non-real-time Priority

Dependency: Must be greater than TLOWPR.

Release value: 255

PARM Size for User Tasks

Definition: This option defines the size of the PARM area to be allocated by the Job Loader for each user task.

Option: PARM SZ EQU n

Dependency: Must be greater than or equal to 4.

Release value: 50

PARM Size for System Tasks

Definition: This option defines the size of the PARM area to be used by system tasks.

Option: SYPARM SZ EQU n

Dependency: Must be greater than or equal to 4.

Release value: 8

Millisecond Clock Interrupt Interval

Definition: This option defines the maximum time a task may execute before being interrupted.

Option: CLKINT EQU n

Dependency: None.

Release value: 100

Millisecond Time-out Interval

Definition: This option defines the minimum interval at which events may be timed-out.

Option: TOINT EQU n

Dependency: Must be greater than or equal to CLKINT, usually a multiple thereof.

Release value: 500

I/O Recovery Attempts

Definition: This option specifies the number of retries allowable on an attempt to recover from an I/O error before declaring the error irrecoverable.

Option: IOREC EQU n

Dependency: None.

Release value: 6

Number of Blocks Per Scratch Segment

Definition: This option specifies the number of additional blocks which will be allocated for each scratch segment used in a job.

Option: STDPSEQ EQU n

Dependency: None.

Release value: 50

Number of Scratch Segments for Standard Expand

Definition: This option specifies the number of scratch segments which will be assigned when the end of allocated area is reached in any scratch file.

Option: STDFEXPS EQU n

Dependency: None.

Release value: 4

Standard Block Size

Definition: This option defines the standard block size used by the system.

Option: STDBS EQU n

Dependency: Should be multiple of sector size to which mass storage has been formatted.

Release value: 480

Maximum Number of Machine States

Definition: This option defines the number of machine states not reserved for system use.

Option: STATEND EQU n

Dependency: The value must correspond to the highest none reserved machine state.

Release value: 6

Maximum Number of Device Identifiers

Definition: This option specifies the maximum number of mass storage device identifiers for the file manager.

Option: MAXDID EQU n

Dependency: None.

Release value: 8

Maximum Number of File Segments

Definition: This option specifies the maximum number of segments allowed per file.

Option: MAXSEG EQU n

Dependency: Maximum value is 38.

Release value: 30

System File Access Security Code

Definition: This option defines the system master security code which allows access to all files in the system.

Option: MPXACCES EQU n

Dependency: None.

Release value: \$\$\$\$

CPU Default Assignment

Definition: This is a rotating 8-character entry which will assign a default value for the CPU assignment for any task not requesting a specific CPU.

Option: CPUASG GEN \$n
GEN \$n

Dependency: The CPU must be available for assignment.

Release value: \$01010101
\$01010101

Milliseconds Until I/O Time-out Check

Definition: This option defines the minimum interval at which a check will be made for I/O time-outs.

Option: IOTT EQU n

Dependency: CLKINT IOTT TOINT.

Release value: 200

Milliseconds Until Event Time-out Check

Definition: This option defines the minimum interval at which a check will be made for Event time-outs.

Option: EVNTTT EQU n

Dependency: CLKINT EVNTTT TOINT.

Release value: 300

Maximum Security Level

Definition: This option defines the maximum security level allowed.

Option: MAXSECL EQU n

Dependency: Value must be of type specified by SECURITY option. For Level, must be between 0 and 8. For Compartmental, mask must have value between \$00 and \$FF.

Release value: 8

Maximum Device Number

Definition: This option defines the maximum number of mass storage device types allowed.

Option: MAXDT EQU n

Dependency: Must be less than or equal to the number of mass storage devices.

Release value: 5

System Device Type

Definition: This option specifies the device type of the system unit.

Option: SYSDT EQU n

Dependency: Must be valid device type.

Release value: D858D (1867-20)

Global Common Size

Definition: This option defines the global common size for the system.

Option: GCSIZE EQU n

Dependency: Amount of global common pages on global common block.

Release value: 0

Global Common Block Name

Definition: This option defines the global common names and locations of global common blocks.

Option: GCBLK name, size, P1, P2, ..., Pn
name = 1-8 character block name.
size = number of pages in block.
P1-Pn = physical pages.

Dependency: Total number of pages of all (collective) blocks equals the parameter in GCSIZE.

Release value: None defined.

ASSEMBLY OPTIONS FOR OSPOOL COMDECK

The OSPOOL COMDECK consists of a set of equates defining the amount main memory to be reserved as the Memory Pool. The Memory Pool begins on the page succeeding the end of operating system code and exists to insure memory is available for the various tables and buffers required by MPX/OS.

Memory Required by Interactive Terminal Subsystem (ITS)

Definition: This option defines the amount of memory required for tables and buffers used by ITS.

Option: ITSSZ EQU n

Dependency: Amount of memory required dependent on number of interactive terminals to be supported.

Release value: 20*200

Memory Required by I/O Subsystem

Definition: This option defines the amount of memory required for tables and buffers used by the I/O Subsystem.

Option: IOSSZ EQU n

Dependency: Amount of memory required dependent on number of peripherals to be supported.

Release value: 30*200

Memory Required for System Job Tables

Definition: This option defines the amount of memory required for tables used for job and task management.

Option: JOBSZ EQU n

Dependency: Amount of memory required dependent on maximum number of jobs allowed to be active in the system at any one time.

Release value: 10*400

Modifying the Equipment Status Table (EST)

Definition: The EST contains an 8-word entry for each device known to the system.

(Note: Device availability is divided into system and user. A system available device accessed by a user is referred to as a logical device, while a system available device accessed by the system or a user available device accessed by a user is referred to as a physical device).

Dependency: Each EST entry for a physical device must have a corresponding DET entry.

MACRO: The macro definition is as follows:

ESTGEN DID,HT,UN,DETA,LCF,DCF,FLGS,STM,DIC

DID = Device Identifier.

HT = Hardware Type. The defined values are:

DP or 1 = Disk unit
MT9 or 2 = Nine-track magnetic tape
CR or 3 = Card Reader
CP or 4 = Card Punch
LP or 5 = Line Printer
PR or 5 = Line Printer
CRT or 6 = Keyboard/Display
TT or 7 = Teletype
CT or 8 = Cartridge Tape
PLT or 9 = Plotter
FDD or 10 = Flexible Disk Drive
CCC or 11 = CYBER Channel Coupler
MT7 or 12 = Seven-track magnetic tape
IT or 13 = Interactive Terminal pseudo device
RBT or 14 = Remote Batch Terminal pseudo device
CN or 15 = Communication Network pseudo device
PI or 16 = Data Pipe pseudo device
MUX or 17 = BCLA/MUX
SMX or 18 = MPCLA
OPF or 19 = OPF psuedo device (CYBER console)

UN = Unit Number.

DETA = DET address.

LCF = Legal Command Flags. This is a 32-bit entry reading left to right. Each bit describes a function which is legal on this unit. It must be set as a hexadecimal value in the MACRO. The bit definitions are as follows:

Mnemonic	Bit	Function
ZSEEKMD	0	Return-to-zero seek
REWD	0	Rewind logical unit
RDMD	1	Read
WRMD	2	Write
EOFMD	3	Write end-of-file
FRMTMD	3	Format track command
FRMTRQ	FRMTMD+16	Format Track I/O request
ERASMD	4	Erase 6 inches of tape
FUNCMD	4	Function command
FUNCRQ	FUNCMD+16	Function I/O request
BKSPMD	5	Backspace one record
SFWM	6	Skip to end-of-file forward
DIAGCMD	6	Diagnostic command
DIAGRQ	DIAGCMD+16	Diagnostic request
LOCMD	7	Locate to specified block
UNLMD	8	Unload unit
ARDMD	9	Alternate Read
AWRMD	10	Alternate Write
SELM	11	Select Mode
STATMD	12	Status command
CLRMD	13	Clear command
SBKMD	14	Skip to end-of-file backward
UNITMD	15	Select unsolicited interrupt
ASSGNRQ	ASSGNMD+16	Assign device command code

DCF = Device Command Flags. This is a 32-bit entry reading left to right. Each set bit describes a function which is to be processed by the device manager.

FLGS = Flags. This is a 16-bit entry reading left to right.

Bit 0 - Assignment flag. This flag describes whether or not the unit is available for assignment. The defined values are:

0 = Unassigned
1 = Assigned

Bit 1 - System/User flag. User units may be requested by and assigned to the user. System units may be only assigned for use by system tasks. The defined values are:

0 = System
1 = User

Bit 2 - Up/Down flag. This flag describes the operational status of the unit. The defined values are:

0 = Unit is up
1 = Unit is down

Bit 7 - Physical Unit Busy flag. The defined values are:

0 = Unit is not busy

1 = Unit is busy

Bits 8-15 - Security Information.

STM = Status Message address.

DIC = Device Incident Count.

Release values:

Logical Devices:

PFMEST	ESTGEN	File,DP,0,0,\$F70F0000,\$60000000,\$0400,0,3
ITEST	ESTGEN	Terminal,IT,0,0,\$60180000,\$00000000,\$0000,0,2
CEST	ESTGEN	Network,CN,0,0,\$60180000,\$00000000,\$0000,0,2
PIWEST	ESTGEN	(WRITPIPE),PI,0,PIDET,\$B0000000,\$00000000,0,0,2
PIREST	ESTGEN	(READPIPE),PI,1,PIDET,\$C0000000,\$00000000,0,0,2
DEST	ESTGEN	Dummy,DP,0,0,\$FFFFFFF,\$00000000,\$0000,0,2

Physical Devices:

FDDEST	ESTGEN	(FDD 0),FDD,0,FDDDET,\$E11D1000,\$E10D1000,\$4000,0
CR1EST	ESTGEN	(CARD 1),CR,0,CRDET,\$C41D0000,\$401D0000,\$0000,0
LP1EST	ESTGEN	(LINE 1),LP,0,LPDET,\$B41D0000,\$201D0000,\$0000,0
MT0EST	ESTGEN	(MT9 0),MT9,0,MTDET,\$FE9F0000,\$FE9F0000,\$4000,0
MT1EST	ESTGEN	(MT9 1),MT9,1,MTDET,\$FE9F0000,\$FE9F0000,\$4000,0
CRTEST	ESTGEN	(CRT 0),CRT,0,CRTDET,\$001D0800,\$001D0800,\$0000,0
MUXEST	ESTGEN	(BCLA 0),MUX,0,BCLADDET,\$001D0800,\$001D0800,\$0000,0
SMXEST	ESTGEN	(MPCLA 0A),SMX,0,UCLADDET,\$017D0800,\$097D0800,\$0000,0
SMXEST2	ESTGEN	(MPCLA 0B),SMX,1,UCLADDET,\$017D0800,\$097D0800,\$0000,0
SMXEST1A	ESTGEN	(MPCLA 1A),SMX,0,UCLADDET1,\$017D0800,\$097D0800,\$0000,0
SMXEST1B	ESTGEN	(MPCLA 1B),SMX,1,UCLADDET1,\$017D0800,\$097D0800,\$0000,0

SMXEST2A	ESTGEN	(MPCLA 2A), SMX, 0, UCLADET2, \$017D0800, \$097D0800, \$0000, 0
SMXEST2B	ESTGEN	(MPCLA 2B), SMX, 1, UCLADET2, \$017D0800, \$097D0800, \$0000, 0
SMXEST3A	ESTGEN	(MPCLA 3A), SMX, 0, UCLADET3, \$017D0800, \$097D0800, \$0000, 0
SMXEST3B	ESTGEN	(MPCLA 3B), SMX, 1, UCLADET3, \$017D0800, \$097D0800, \$0000, 0
SMXEST4A	ESTGEN	(MPCLA 4A), SMX, 0, UCLADET4, \$017D0800, \$097D0800, \$0000, 0
SMXEST4B	ESTGEN	(MPCLA 4B), SMX, 1, UCLADET4, \$017D0800, \$097D0800, \$0000, 0
OPFEST	ESTGEN	(OPF 0), OPF, 0, OPFDET, \$001D0800, \$001D0800, \$2000, 0
RBTEST	ESTGEN	(RBT 0A), RBT, 0, RBTDET, \$001D0800, \$001D0800, \$0000, 0
RBTEST1	ESTGEN	(RBT 1B), RBT, 1, RBTDET, \$001D0800, \$001D0800, \$0000, 0
FDDEST	ESTGEN	(FDD 0), FDD, 0, FDDDET, \$E11D1000, \$E10D1000, \$4000, 0
CCCEST	ESTGEN	(CCC 0), CCC, 00, CCCDET, \$600D0000, \$60000000, \$4000, 0
MESTO	ESTGEN	SYSTEM01, SYSDT, 0, SMDDET, \$E17D1000, \$E17D1000, \$8000, 0, 2

Modifying the Device Environment Table (DET)

Definition: The DET contains an entry corresponding to each device manager in the system. Each entry is assembled using the DETGEN MACRO followed by any additional space reservations required by the device manager.

(Note: A device manager may be capable of controlling more than one unit of a particular device).

Dependency: Each DET entry must have a corresponding Task Control Table (TCT) entry.

MACRO: The macro definition is as follows:

```
DETGEN TOV, DETN, CPN, DMAN, DSR, FLGS, STLG, TCTA, IMB
```

TOV = Time out value.

DETN = FWA of next DET entry.

CPN = Number of CPU through which device will be controlled.

DMAN = DMA (or ADT) channel used by device.

DSR = DMA State Register.

FLGS = Flags.

Bit 0 = Interrupt flag.

Bit 1 = Timeout flag.

Bit 2 = Special interrupt processing flag.

Bit 7 = Device Manager I/O interrupt flag.

STLG = Length of status field in Request Environment Table (RET).

TCTA = FWA of Device Manager Task Control Table (TCT).

IMB = Interrupt Mask Bits. (Refer to MP-60 Emulation Reference Manual for bit definitions).

Release values:

CRDET	DETGEN	\$0000,LPDET,1,1,0,0,CRSTL,CRITCT,\$0100
	GEN,C	\$00,\$00,\$00,\$00
	BSS,H	80
LPDET	DETGEN	\$0000,MTDET,1,7,0,0,LPSTL,LPITCT,\$8000
	GEN,C	\$00,\$00,\$00,\$00
	BSS,C	140
MTDET	DETGEN	\$0000,CRTDET,1,0,0,0,MTSTL,MT9TCT,\$0040
	GEN,C	\$01,\$01,\$01,\$01
	GEN,C	0,0,0,0
	GEN,H	0,0,0,0
	GEN,C	0,1,0,0
	BSS	5
CRTDET	DETGEN	\$0000,BCLADET,1,3,0,0,CRTSTL,CRTTCT,\$0010
	GEN	0
BCLADET	DETGEN	\$0000,UCLADET,1,\$88+2,CPU1DSR,0,BCLASTL,BCLATCT,\$0020
	GEN	0,0,0,0
UCLADET	DETGEN	\$0000,UCLADET1,1,\$88+2,CPU1DSR,0,UCLASTL,UCLATCT,\$2000
	GEN	0,0,0,0,0,0,0,0,0
UCLADET1	DETGEN	\$0000,UCLADET2,1,\$88+2,CPU1DSR,0,UCLASTL,UCLATCT1,\$000
	GEN	0,0,0,0,0,0,0,0,0
UCLADET2	DETGEN	\$0000,UCLADET3,1,\$88+2,CPU1DSR,0,UCLASTL,UCLATCT2,\$100
	GEN	0,0,0,0,0,0,0,0,0
UCLADET3	DETGEN	\$0000,UCLADET4,1,\$88+2,CPU1DSR,0,UCLASTL,UCLATCT3,\$080
	GEN	0,0,0,0,0,0,0,0,0
UCLADET4	DETGEN	\$0000,RBTDET,1,\$88+2,CPU1DSR,0,UCLASTL,UCLATCT4,\$0400
	GEN	0,0,0,0,0,0,0,0,0

RBTDET	DETGEN	\$0000,FDDDET,1,0,0,0,RBTSTL,RBTCT,\$0000	
	GEN	0	
	GEN,H	0	DDSRUH
	GEN,H	5	DLENH
	VFD	16/0,16/RBTCTFWA	DDSRPH / DCLUSTH
	GEN	0	DCUCT
*DLFWA	BSS	0	Start of line tables
	GEN	0,0,0,0,0	1st MODE4 MPCLA Line Table
	GEN	0,0,0,0,0	2nd MODE4 MPCLA Line Table
RBTCTFWA	BSS	0	Cluster Tables FWA
*RBTCTOA	BSS	0	1 Cluster Table for 1st line
	GEN	0	Priority
	VFD	16/0,16/RBTCT1A	Initialization forward thread
	GEN	0,0,0,0,0	
	GEN	0,0,0,0,0	
RBTCT1A	BSS	0	1 Cluster Table for 2nd line
	GEN	0	Priority
	VFD	16/0,16/0	Initialization forward thread
	GEN	0,0,0,0,0	
	GEN	0,0,0,0,0	
FDDDET	DETGEN	\$0000,CCCDDET,1,0,0,0,FDDSTL,FDDTCT,\$4000	
	GEN,C	128,192	CPSDC
	GEN,C	0,0	RECDC
	GEN,H	0,0	ARADH
	GEN,H	0,0	BYTDH
	GEN	0,0	FCAD
	GEN,H	0,0	BTSDH
	BSS,C	192	AQBDC
CCCDDET	DETGEN	\$0000,SMDDET,1,\$88+3,CPU1DSR,0,CCCSTL,CCCTCT,\$0004	
	GEN	0	DRRT
	GEN	0	DAOC
	GEN	0	DREQ
	GEN	0	DLNG
	GEN	0	DAOB
	GEN	0	DRSP
	GEN	0	DRLN
SMDDET	DETGEN	\$0000,OPFDET,1,\$88+0,CPU1DSR,0,SMDSTL,SMDTCT,\$0002	
	VFD	8/SYSDT,8/0,8/0,8/0	
	VFD	8/0,8/0,8/0,8/0	
	BSS,H	8	
	GEN,C	\$0,\$0,\$0,\$0	
	GEN,C	\$0,\$0,\$0,\$0,\$0,\$0,\$0,\$0	
	GEN,C	\$0,\$0,\$0,\$0,\$0,\$0,\$0,\$0	
OPFDET	DETGEN	\$0000,0,1,0,0,0,0,OPFTCT,0	
	GEN,H	0	DPITH
	GEN,H	0	DURAH
	GEN,H	0	DIRLH
	GEN,H	0	DIROH

GEN	0	DOCM
BSS,H	16	DWBAH
BSS,H	16	DRRAH
BSS,C	16	DRLUC
BSS,C	16	DWLUC
BSS,C	128	DINBC
BSS,C	128	DIRBC
GEN	0	DSEL

PIDET	DETGEN	\$0000,0,1,0,0,0,0,0,0	
	GEN	0	Head of PLT thread
	GEN	0,0,0	Extra for future implementation

After modifying the MP-60 emulator or the MPX/OS bootstrap programs or after creating a new edition of either the MPX/OS library or the MPX/OS operating system, a backup tape should be created.

PRELIBOS provides the capability of creating an MPX/OS system tape. Refer to the PRELIBOS Reference Manual for a description of creating an MPX/OS system tape.

The file maintenance package (FMP) provides the capability of dumping and loading user files to and from tape. Refer to the Utility Reference Manual for a description of FMP.



COMMENT SHEET

TITLE: MP-60 MPX/OS Version 3 Installation Handbook

PUBLICATION NUMBER: 1732915 REVISION: A

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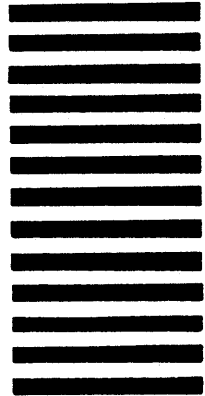
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