



Preliminary Series 5 Computer System Supplement 4. Installing The MP/M II Operating System

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NOTE

This revision replaces but does not
obsolete previous revisions
of this document.

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ALTOS SERIES 5 COMPUTER SYSTEM**SUPPLEMENT 4. INSTALLING THE MP/M II OPERATING SYSTEM****GENERAL INFORMATION**

This supplement provides all the information necessary for you to install the MP/M II operating system after the diagnostics have been successfully executed. It describes the MP/M II Operating System set-up and loading instructions and some system features. It explains how to use the PIP command to make a backup copy of the MP/M II diskette.

It also introduces you to related MP/M II technical manuals that came with your system diskette. These manuals were prepared by Digital Research Corporation. You should familiarize yourself with them before installing the operating system and refer to them, as required, during the installation process for further information regarding the MP/M II operating system.

DIGITAL RESEARCH MANUALS**MP/M II USER'S GUIDE**

Information on using the MP/M II operating system and running application programs on it. General information about MP/M II, its structure, messages, commands, and facilities.

MP/M II SYSTEM GUIDE

System internal organization and how to customize MP/M II.

MP/M II PROGRAMMER'S GUIDE

Programming interface to MP/M II, the system modules, utilities.

KNOWN SYSTEM DEFICIENCIES

At the time this preliminary document was printed, the following system deficiencies were known:

1. MPMSETUP must be run from the ADX diskette. It cannot be run from the MP/M II system.

2. Sometimes the self-test will run spontaneously when the system is booted after running MP/M II.
3. FTP, the File Transfer Program, can only transfer 15 files at a time under MP/M II 2.1. If you wish to exceed this limit, either use CP/M or multiple calls to FTP under MP/M II.

MP/M II OPERATING SYSTEM FEATURES

MP/M II is group of control programs that coordinate the activity of the computer system. They control memory utilization, manage files, access hardware devices, and perform other housekeeping chores. Some of these capabilities can be called and run from the console and some are used by the applications programs.

The manual "MP/M II USER'S GUIDE" describes MP/M II capabilities. This manual will help you in doing the operations covered in this section, and should be consulted.

Section 2 of the USER'S GUIDE lists all utilities provided with MP/M II by Digital Research. Altos provides other programs, some on the MP/M II system diskette and some on the ADX (diagnostic) diskette.

Here are some of the utilities provided by Altos.

Filename	Command	Command definition
COPY.COM	COPY	Copies entire diskette.
MFORMAT.COM	MFORMAT	Formats diskette.
BOOTCOPY.COM	BOOTCOPY	Transfers boot-track information (first two tracks) from diskette to diskette.
MPMSETUP.DIA	MPMSETUP	Updates the MP/M II boot sector on a diskette containing operating system files. The boot sectors contain relevant information such as baud rates. This information is used by the operating system to initialize itself.
		Note: MPMSETUP can only be run from the ADX diskette.
DISKSTAT.PRL	DISKSTAT	Allows you to obtain information on floppy and hard disk I/O errors. The user should use this command whenever I/O errors are suspected.

This file also displays the device name and physical attributes.

A temporary error is an I/O error that is successfully completed during a retry. If, after nine retries, the error still exists, a permanent error is declared.

The error counts are cumulative from power on until the system reset button is pushed or power is turned off. Each time the system is powered on, the error counts are set to 0, and will increment any time an I/O error occurs.

COPY, BOOTCOPY, and MFORMAT are provided on the ADX diskette and are run from that diskette. DISKSTAT is provided on the MP/M II system diskette. MPMSETUP may be on the MP/M II diskette; it must be copied to the ADX diskette and run from there.

DISKETTE INSERTION AND WRITE PROTECTION

The following information will be useful for doing the procedures in the rest of this section.

Diskette Insertion

To insert a 5 1/4" floppy diskette in a drive, open the door latch and insert the diskette with the manufacturer's label up. Seat it gently and close the door. (Note: inserting it upside down does no harm; it just won't work.)

Diskette Write Protection

5 1/4" floppy diskettes have a "write-enable" notch cut into the side of the jacket, near the label area.

NOTE

If the notch is open, data can be written on the diskette.

The diskette can be protected against being written on. The diskette manufacturer provides a special tape which is used to cover the notch.

NOTE

Before doing the procedures in the rest of this section, protect your master MP/M II diskette by covering the write notch with tape on both sides.

SYSTEM LOADING AND BACK-UP PROCEDURES

The MP/M II system diskette is ready to run. However, before you begin working with your MP/M II system, Altos recommends that you make a back-up copy of the MP/M II diskette for safekeeping, and then store that diskette in a safe place as a back-up for your system.

This section describes two procedures for making a back-up copy of your MP/M II system diskette. If your system has a hard disk, use the first procedure below; if it has two floppy disk drives, use the second procedure which starts on page 4-8 of this section.

When you have backed-up the MP/M II system diskette, use a copy to explore the system capabilities. It is configured for a three-user system, but will run on a one- or two-console system.

The GENSYS utility program, described later in this document, explains how to modify your system for one or two users. If you need to do this, it is not necessary to do it immediately. You can work with the system as is until you feel comfortable with it.

To start up MP/M II, power up your system and insert the system diskette in the right-hand drive, label up, and press the Reset button on the upper right. The MP/M II message will display on the console.

If you have a hard disk system, it will attempt to boot from the hard disk. Because the diagnostic procedures have initialized the hard disk it cannot boot. It will ask you where to boot from. Specify the floppy disk drive. When the system has booted, you will receive the MP/M II prompt. This is a number, letter, and ">"; for example:

0A>

Whenever the back-up procedures call for you to bring up the MP/M II system, use the procedure just described.

BACKUP PROCEDURE 1 (FOR SERIES 5-5D SYSTEMS WITH HARD DISK DRIVES)

This procedure leads you through the following operations:

If necessary, initializing the hard disk.

If necessary, formatting one or two blank, unformatted diskettes.

Using the BOOTCOPY program to place the boot system tracks on the blank diskettes.

Copying MP/M II from the master diskette onto the hard disk.

Copying MP/M II from the hard disk onto one or two blank diskettes.

The newly copied diskettes become your working copies. Store the original master diskette in a safe place.

What you need:

1. One or two blank diskettes, which will become the MP/M II working copy or copies. These diskettes must be write-enabled.
2. The ADX master diskette, or a working copy of it. If you are using the master diskette, write-protect it by covering the write notch with tape on both sides.
3. The MP/M II master diskette. This diskette must be write-protected. Cover the write notch with tape on both sides.
4. The Digital Research reference manuals for MP/M II, particularly MP/M II USER'S GUIDE.

Procedure steps:

1. The diagnostic procedures in Section 3 initialize the hard disk. If these procedures have not yet been done, do them.

If it is necessary for some reason to re-initialize the hard disk after the diagnostics have been run, use the HRDINIT5 program on the ADX diskette to do so. Section 3 explains how to do this. (Note: When the hard disk is initialized, any old data on it is lost.)

2. Copy the master MP/M II diskette material to the hard disk. Insert the MP/M II diskette into logical drive A. (If your system has two floppy disk drives as well as a hard disk, the right-hand drive is drive A.) Press the reset button to boot MP/M II.

The console will display the ALTOS identification message and the message "Press any key to interrupt Boot operation". Press a key, such as the space bar. The console will respond with a choice to boot from the hard disk or a floppy disk.

Note: You have about two seconds after the message to press a key. If you are not in time, you can press the Reset button again for a new try.

Enter a 2 in order to boot from the floppy disk.

Information will display on the console screen, followed by the MP/M II prompt of a number, a letter, and ">", for example:

0A>

Use the PIP operating system command to move all the operating system programs from the source disk to the hard disk. After 0A> enter

PIP B:=A:*. *[V]

and press the RETURN key.

3. If your blank diskettes are not formatted, use the MFORMAT program to format a blank diskette. This program is on the ADX diskette. Insert that diskette in the drive and press the Reset button to bring it up. After the REQUEST message, enter MFORMAT and press the RETURN key.
 - a. This program will prompt you to exchange the ADX diskette (the source diskette) for a blank, unformatted diskette (the object diskette). It displays the MFORMAT menu and prompts you to enter a menu option number and press the RETURN key. It returns you to the MFORMAT menu when it completes the formatting operation.
 - b. Remove the newly formatted diskette from logical drive A. If you wish to format another diskette, replace it with another and repeat the operation.
 - c. Set your newly formatted diskette(s) aside.
 - d. When you have finished, leave the ADX diskette in the drive for the next operation.
4. Use the BOOTCOPY program to copy the first two boot tracks of the source diskette onto the blank, newly formatted diskettes. BOOTCOPY is available on the ADX diskette. If it is not in the drive (from step 4), insert it and press the Reset button to bring it up. After the REQUEST message, enter BOOTCOPY and press the RETURN key.
 - a. The program will prompt you to insert the source diskette into logical drive A, and press the RETURN key. Place the MP/M II master diskette in logical drive A, the right-hand drive, as the source diskette.
 - b. The program then prompts you to remove the source diskette and insert the object diskette (one of the formatted diskettes) into logical drive A, and press the RETURN key.
 - c. Repeat for a second formatted blank diskette, if desired.

5. Use the PIP command to copy the MP/M II system files from the hard disk to the formatted blank diskette. Return to the MP/M II system by inserting the MP/M II diskette in logical drive A and pressing the Reset button.
 - a. The hard disk has a copy of the MP/M II system. (The information was transferred in step 2.) Transfer system control to the hard disk by entering

B:

and pressing the return key.

- b. Remove the MP/M II master diskette and insert one of the blank, formatted, boot-copied diskettes into logical drive A. Copy the contents of the hard disk onto the blank disk in drive A by entering

PIP A:=B:*. *[V]

and pressing the RETURN key.

When the operation completes, store your MP/M II master diskette in a safe place. Use the newly copied MP/M II diskette for all further operations.

- c. If desired you can repeat this operation with a second diskette which has been formatted and given a boot track.

At the end of this procedure you should have copied your MP/M II master diskette onto a newly formatted diskette and stored the master diskette in a safe place. Label the newly copied diskette(s) for identification. Write-protect the diskettes by placing tape over both sides of the write notch.

NOTE

You now have MP/M II functions available on the hard disk. After you have booted up from a floppy disk in logical drive A, you can switch to the hard disk drive (drive B) and run from it. To do so, after the prompt `ØA>`, enter

B:

and press the RETURN key.

The MPMSET utility program, described later, allows you to modify your system to boot from the hard disk without using a floppy diskette.

BACKUP PROCEDURE 2 (FOR SERIES 5-15D SYSTEMS WITH TWO FLOPPY DISK DRIVES)

This procedure leads you through the following operations:

If necessary, formatting one or two blank diskettes.

Using the COPY utility to make a backup copy or copies of the MP/M II master diskette.

What you need:

1. One or two blank diskettes, which will become the MP/M II working copy or copies. These diskettes must be write-enabled.
2. The MP/M II master diskette. This diskette must be write-protected. Cover the write notch with tape on both sides.
3. The Digital Research reference manuals for MP/M II, particularly MP/M II USER'S GUIDE.

When making a backup copy of the system disk, proceed as follows.

1. If necessary, use the MFORMAT program to format one or two blank diskettes. This program is on the ADX diskette.
 - a. Turn on the system, insert the ADX master diskette into logical drive A (the right-hand drive), and press the RESET button.
 - b. Insert a blank, unformatted diskette into logical drive B (the left-hand drive).
 - c. After the REQUEST prompt, enter MFORMAT, and press the RETURN key.
 - d. This program will prompt you to specify the drive assignments for the ADX diskette (the source diskette), and for the blank, unformatted diskette (the object diskette). It returns you to the MFORMAT Menu when the format operation is complete.
 - e. You may place another diskette in drive B and format it, if desired.
 - f. When you have finished formatting diskettes, exit from MFORMAT to the ADX menu. Leave the ADX diskette in the drive for the next step.
2. Use the COPY utility to make a backup copy of the master diskette. This program is on the ADX diskette. If ADX is not in control (from step 1), insert the ADX diskette in

logical drive A (the right-hand drive), and press the Reset button.

- a. Insert a newly formatted blank diskette into drive B.
- b. After the REQUEST prompt, enter COPY and press the RETURN key.
- c. The program will prompt you to specify the drive assignments for the source diskette, and for the blank, formatted diskette. Place the MP/M II diskette in drive A as the source. Drive B is the destination.
- d. The program returns you to the ADX menu when complete.
- e. You can repeat this procedure to make another copy.

At the end of this procedure, you should store the MP/M II master diskette in a safe place. Label the newly copied diskettes with the identification information. From now on, use a copied diskette to run MP/M II. Write-protect each diskette by placing tape over both sides of the write notch.

If you wish to bring up the MP/M II system now, insert a new MP/M II diskette into logical drive A and press the Reset button.

MANAGING FILES WITH THE PIP UTILITY PROGRAM

THE PIP utility program transfers files between any two peripheral components in your computer system. Use PIP to copy, transfer, break, or join files on a diskette or hard disk. PIP can copy files from one user to another. PIP can list a text file on the printer.

Using PIP, you can compose elements of a software program, edit text, move one or more files from one storage device to another, or use one file to control a system device, or to modify another file. You probably will use PIP more than any other transient file listed on your operating system directory.

For a complete explanation of the PIP utility, see the manual entitled MP/M II USER'S GUIDE that came with your operating system.

MODIFYING YOUR SYSTEM WITH GENSYS

The GENSYS program is described in section 5 of MP/M II SYSTEM GUIDE. Section 1 of the USER'S GUIDE gives some background information. If you wish to modify your system, read this information carefully.

Changing Your System To One Or Two Users

Altos furnishes your system set up for three users. Changing it for fewer users is fairly simple; however, you should read the SYSTEM GUIDE carefully before you do it.

For your convenience, here is a short explanation of how to change the system for one user or two users. This is supplementary information and does not replace the information in the SYSTEM GUIDE.

1. Bring up MP/M II and run GENSYS.
2. Only two items need to be changed. All other questions can be answered by pressing the RETURN key to confirm the default value shown.
3. The two entries that need to be changed are:
 - a. "Number of TMPs (system consoles) (#3)?"
 - b. "Number of User Memory Segments (#3)?"

If you wish to specify a two-user system, reply #2 to both of these.

If you wish to specify a one-user system, reply #1 to both of these.

Figure 1, following, shows a sample run of GENSYS to change the system to a one-user system. It is a sample only, and some of the details and defaults may be different on your system.

VIRTUAL DISK

One reason to change your system to have fewer users is that MP/M II can make available a "virtual disk," called disk E. This is a memory device of up to 96 kilobytes of storage capacity. If you use fewer than 3 banks of memory in your system, the remaining bank(s) will be available for a virtual disk. The virtual disk has a capacity of 48K bytes for each bank not used by MP/M II. (If you have 3 banks in use, the virtual disk will have zero bytes of storage.)

This "disk" can be used like a real disk of the same capacity with one important exception. When you turn the power off, or power goes off unexpectedly, the contents of the "disk" are erased. A good use for the virtual disk is temporary storage for work files in your program. These files would not normally be saved so the power-off problem will not be noticed. When you are working with important information in virtual disk files, you should transfer a copy to an actual disk from time to time for security.

The advantage of the virtual disk is that because all accesses to it are actually memory accesses, the "disk" is very fast.

NOTE

By using the MPMSETUP utility, described later in this section, you can change the name as disk E. For example, you could make it disk M, for Memory.

GENSYS for a One or Two Bank System

Figure 1, following, shows a sample run of GENSYS. <CR> stands for a carriage return entered by the user. The default options (shown inside parentheses) were entered by pressing the RETURN key. Only two items were changed.

* * * * *

Note: Resident Disk Processors

This note applies only for those doing advanced system configuration. When including Resident System Processors, bank 0 cannot go below 4000H in size. You may wish to write this note at section 4.5 of the MP/M II SYSTEM GUIDE.

```

ØA>GENSYS
ØØ:ØØ:16 A:GENSYS .COM

```

```

MP/M II V2.1 System Generation
Copyright (C) 1981, Digital Research

```

```

Default entries are shown in (parens).
Default base is Hex, precede entry with # for decimal

```

```

Use SYSTEM.DAT for defaults (Y) ? <CR>
Top page of operating system (FF) ? <CR>
Number of TMPs (system consoles) (#3) #1 <CR> **
Number of Printers (#2) ? <CR>
Breakpoint RST (Ø7) ? <CR>
Enable compatibility attributes (Y) ? <CR>
Add system call to user stacks (Y) ? <CR>
Z8Ø CPU (Y) ? <CR>
Number of ticks/second (#6Ø) ? <CR>
System Drive (A:) ? <CR>
Temporary file drive (A:) ? <CR>
Maximum locked records/process (#16) ? <CR>
Total locked records/system (#32) ? <CR>
Maximum open files/process (#16) ? <CR>
Total open files/system (#32) ? <CR>
Bank switched memory (Y) ? <CR>
Number of user memory segments (#3) ? #1 <CR> **
Common memory base page (CØ) ? <CR>
Dayfile logging at console (Y) ? <CR>

```

```

SYSTEM DAT FFØØH Ø1ØØH
TMPD DAT FEØØH Ø1ØØH
USERSYS STK FDØØH Ø1ØØH
XIOSJMP TBL FCØØH Ø1ØØH

```

```

Accept new system data page entries (Y) ? <CR>

```

```

RESBDOS SPR FØØØH ØCØØH
XDOS SPR CEØØH 22ØØH

```

```

Select Resident and Banked System Processes:

```

```

ABORT RSP (N) ? <CR>
MPMSTAT RSP (N) ? <CR>
SCHED RSP (N) ? <CR>
SPOOL RSP (N) ? <CR>

```

```

BNKXIOS SPR AEØØH 1FØØH
BNKBDOS SPR 8BØØH 23ØØH
BNKXDOS SPR 89ØØH Ø2ØØH
TMP SPR 85ØØH Ø4ØØH

```

Figure 1 - Sample GENSYS Run
(continues)

```
LCKLSTS DAT 7400H 0300H
CONSOLE DAT 7300H 0100H
```

Enter memory segment table:

```
Base,size,attrib,bank (87,79,80,00) ? <CR>
```

```
MP/M II Sys 8700H 7900H Bank 00
Memseg  Usr 0000H C000H Bank 01
```

Accept new memory segment table entries (Y) ? <CR>

** GENSYS DONE **

0A>

** Note: The only changes from the original system are to change from three system consoles to one and from three memory banks to one. These changes are flagged by ** at the right.

To change to a two-console, two-bank system, enter #2 in place of #1 at the two places flagged.

Figure 1 - Sample GENSYS Run
(finished)

MPMSETUP

The MPMSETUP program is not part of the ordinary installation procedures. It allows you to make certain system changes without running GENSYS, and certain changes that GENSYS cannot make. For example, it allows you to change console and printer baud rates, or to change the default names for the logical drives. You can designate Drive A to be on the hard disk instead of the floppy disk. You can change your system to boot from the hard disk without a floppy disk.

MPMSETUP cannot, at present, be run under MP/M II. It is run from the ADX disk. If it is not on the ADX disk, use the PIP utility to copy it to the ADX diskette from the MP/M II diskette. (If you have only one diskette drive, copy it to the hard disk or the virtual disk first and then to the ADX diskette.)

MPMSETUP FUNCTIONS

Before you run MPMSETUP, read the following information.

Note: The changes you make with MPMSETUP do not take effect unless you use the update function (menu selection 5). The changes will be in effect when you next boot your system. You can exit from MPMSETUP without updating, and your system will remain unchanged. This is convenient, in case you have made a mistake.

NOTE

When MPMSET is run from the ADX diskette, the references to disk drives are independent of the MP/M II assignments. The hard disk is simply referred to as the hard disk. the right-hand floppy drive is drive A; if there is a left-hand drive it is drive B. Please use these assignments when responding to MPMSET prompt messages.

Here are the menu choices:

- 1) Copy bootfile to hard disk
- 2) Change default logical names
- 3) Console baud rate setup
- 4) Printer setup
- 5) Update setup
- 6) Exit

1) Copy bootfile to hard disk: This function copies the boot records to the hard disk, so that system boot can be performed from the hard disk.

As furnished, your system will attempt to boot from the hard disk and if it cannot, will ask you where to boot from. Using the "Copy bootfile to hard disk" function allows you to start and run

your system without any diskette in the floppy drive. If you want to be able to run your system without having a floppy diskette in the drive, copy the bootfile and then use function 2, "Change default logical names," to specify the hard disk as logical drive A.

2)Change default logical names: This function allows you to choose the names for the various logical hard disk devices, floppy drives and virtual disk. Only one name per device is allowed and one of the names must be 'A'.

3)Console baud rate setup: This function is used to set up the baud rates for the various consoles. If you are making a series of changes, you may wish to update after each good change. You can use BOOTCOPY to copy system changes to other diskettes.

4)Printer setup: Series 5 MP/M II supports two printers, one serial and one parallel (Centronics or Centronics-type). The printers are numbered 0 and 1, and this function allows you to specify which printer has precedence (low number). You specify the Centronics type printer as 0 or 1, and the serial printer then becomes 1 or 0. You can also specify the baud rate for the serial printer. The default is 9600 baud.

	<u>Printer Number</u>	
Centronics Parallel	0	1
Serial Printer	1	0

5)Update setup: This function actually does the updating of the boot sectors. This function should be selected only after making sure that all the settings you have chosen are what you want. The program can always be aborted by choosing function 6. If you are making a series of changes, you may wish to update after each good change.

When updating boot information on a floppy diskette, be sure that you update the MP/M II system diskette and not the ADX diskette. Remove the ADX diskette, if necessary. It is only used to invoke MEMSETUP. After you have updated a system diskette, you can use BOOTCOPY to copy system changes to other diskettes.

6)Exit: This function causes you to exit from the MPMSETUP program. If you exit without using function 5, no changes will actually be made.

NOTE

A sample directory is presented on the following page. The directory of your MP/M II system disk may look somewhat different from the sample.

Table 1. Sample MP/M II Disk Directory

SDIR
00:00:40 A:SDIR .PRL

Directory For Drive A: User 0

Name	Bytes	Recs	Attributes	Name	Bytes	Recs	Attributes
ABORT	PRL	4k	5 Dir RW	ABORT	RSP	4k	5 Dir RW
ASM	PRL	12k	74 Dir RW	BNKBDOS	SPR	12k	81 Dir RW
BNKXDOS	SPR	4k	7 Dir RW	BNKXIOS	SPR	8k	60 Dir RW
BOOT	ASM	4k	15 Dir RW	BUTTONS	LIB	4k	4 Dir RW
COMPARE	LIB	4k	9 Dir RW	CONSOLE	PRL	4k	4 Dir RW
DDT	COM	8k	42 Dir RW	DEBLOCK	ASM	12k	80 Dir RW
DIR	PRL	4k	14 Dir RW	DISK	DOC	4k	10 Dir RW
DISKDEF	LIB	8k	51 Dir RW	DISKSTAT	PRL	4k	14 Dir RW
DOWHILE	LIB	4k	7 Dir RW	DSKRESET	PRL	4k	5 Dir RW
DSTACK	LIB	12k	80 Dir RW	DUMP	ASM	8k	36 Dir RW
DUMP	PRL	4k	6 Dir RW	ED	PRL	12k	68 Dir RW
ERA	PRL	4k	15 Dir RW	ERAQ	PRL	4k	29 Dir RW
EXTRN	ASM	4k	2 Dir RW	GENHEX	COM	4k	6 Dir RW
GENMOD	COM	4k	10 Dir RW	GENSYS	COM	12k	74 Dir RW
I8085	LIB	4k	3 Dir RW	INTER	LIB	4k	17 Dir RW
LDRBIOS	ASM	8k	64 Dir RW	LIB	COM	8k	56 Dir RW
LINK	COM	16k	122 Dir RW	LOAD	COM	4k	14 Dir RW
MPM	SYS	32k	234 Dir RW	MPMLDR	COM	8k	45 Dir RW
MPMSETUP	DIA	20k	160 Dir RW	MPMSTAT	BRS	8k	33 Dir RW
MPMSTAT	PRL	8k	33 Dir RW	MPMSTAT	RSP	4k	3 Dir RW
NCOMPARE	LIB	4k	10 Dir RW	PIP	PRL	12k	77 Dir RW
PRINTER	PRL	4k	8 Dir RW	PRLCOM	PRL	4k	21 Dir RW
RDT	PRL	8k	50 Dir RW	REN	PRL	4k	19 Dir RW
RESBDOS	SPR	4k	29 Dir RW	RESXIOS	ASM	20k	154 Dir RW
RMAC	COM	16k	106 Dir RW	SCHED	BRS	4k	12 Dir RW
SCHED	PRL	4k	20 Dir RW	SCHED	RSP	4k	3 Dir RW
SDIR	PRL	20k	137 Dir RW	SELECT	LIB	4k	13 Dir RW
SEQIO	LIB	12k	82 Dir RW	SET	PRL	8k	60 Dir RW
SHOW	PRL	8k	60 Dir RW	SIMP10	LIB	4k	5 Dir RW
SPOOL	BRS	4k	20 Dir RW	SPOOL	PRL	4k	17 Dir RW
SPOOL	RSP	4k	5 Dir RW	STACK	LIB	4k	9 Dir RW
STAT	PRL	12k	78 Dir RW	STOPSPLR	PRL	4k	5 Dir RW
SUBMIT	PRL	8k	42 Dir RW	SYSTEM	DAT	4k	2 Dir RW
TMP	SPR	4k	11 Dir RW	TOD	PRL	4k	20 Dir RW
TODCNV	ASM	16k	126 Dir RW	TREADLES	LIB	4k	5 Dir RW
TYPE	PRL	4k	11 Dir RW	USER	PRL	4k	8 Dir RW
WHEN	LIB	4k	7 Dir RW	XDOS	SPR	12k	79 Dir RW
XREF	COM	16k	121 Dir RW	Z80	DOC	12k	70 Dir RW
Z80	LIB	8k	47 Dir RW				

Total Bytes = 576k Total Records = 3146 Files Found = 77
 Total 1k Blocks = 430 Used/Max Dir Entries For Drive A: 77/ 177