



**AT&T**

999-300-2631S

# **Enhanced Memory Expansion Board**

SuperPak™ User's Guide

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## INTRODUCTION

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The SuperPak™ utility programs — SuperDrive™, SuperSpool™, RAMDISK, are valuable software programs that enhance the performance of your AT&T Personal Computer 6300 (PC 6300) and Personal Computer 6300 PLUS (PC 6300 PLUS) when using the MS-DOS™ operating system.

### 1.1 Features

Below is a brief description of the SuperPak utilities:

#### *SuperDrive*

A program which simulates up to four diskette drives within the random access memory (RAM) of your system. This RAM disk capability enables you to retrieve and store data and command (program) files within RAM, a much faster process than the access and transfer of files from an actual mechanical disk or diskette.

#### *SuperSpool*

A program which outputs data to a printer while permitting you to simultaneously perform other tasks on your PC. Your print output is stored in a predefined area of memory and sent from there to the printer. This frees the microprocessor from having to waste its processing time waiting for the printer. Your Personal Computer 6300 (PC 6300) or Personal Computer 6300 PLUS (PC 6300 PLUS) can therefore execute other software in the “foreground” while the printing of data is handled by SuperSpool in the “background”.

#### *RAMDISK*

A program which simulates hard disk units within RAM. As with SuperDrive, data and programs can be retrieved and stored at RAM speeds using the virtual disk instead of an actual mechanical disk unit. The number of

RAMDISKs that you can create is limited only by MS-DOS. The size of each RAMDISK is limited only by the amount of available RAM and can be tailored to your needs.

## 1.2 How to Use This Manual

SuperPak utility programs will save you time and effort when installed and used properly. This manual is designed to be a user's manual that will guide you through the installation and use of the product. Read the instructions in this manual carefully to familiarize yourself with SuperPak's capabilities.

This section provides an outline of the format notation used throughout the manual and a list of related documentation.

### NOTE

*The examples used in this manual assume you are using a PC 6300/PC 6300 PLUS system with two floppy disk drives. If you are using a system with a single floppy disk drive and a fixed disk drive, these examples can easily be modified.*

#### 1.2.1 Format Notation

The following command format notation is used in this manual:

- *Boldface* indicates information that you enter. A boldface entry can be a parameter such as a file name or a key to be pressed.
- *Uppercase characters* indicate items (such as commands) that you enter exactly as shown. However, you can enter those items in any combination of upper- or lowercase letters.

- *Lowercase letters* represent parameters that are defined by the user. While the user defines the parameters, they must satisfy the conditions of the command description.
- *Angle brackets (< >)* tell you to press a key. For example, <Esc> instructs you to press the “Esc” key. You do not have to press the “Enter” key unless you are specifically told to do so.
- *Square brackets ([ ])* indicate an optional term which is included or omitted in the command at your discretion. The brackets are not entered.
- System prompts and messages are shown in **color**.

### 1.2.2 Related Documentation

This manual assumes some familiarity with the MS-DOS operating system and AT&T'S Personal Computer 6300 (PC 6300) or Personal Computer 6300 PLUS (PC 6300 PLUS) hardware. You may find the following manuals helpful:

- *Getting Started With Your AT&T Personal Computer 6300 PLUS.*
- *AT&T Personal Computer 6300 Reference Manual.*
- *AT&T Personal Computer 6300 User's Guide.*
- *MS-DOS by Microsoft User's Guide.*
- *AT&T Enhanced Memory Expansion Board User's Guide.*
- *AT&T Enhanced Memory Expansion Board Technical Reference Manual.*

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# GETTING STARTED

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This section describes how to prepare your Personal Computer 6300 (PC 6300) or Personal Computer 6300 PLUS (PC 6300 PLUS) MS-DOS boot diskette in order to use any of the SuperPak programs. It also includes descriptions and basic operating instructions for the SuperPak utilities — SuperDrive, SuperSpool, and RAMDISK.

### 2.1 Backing Up Your Software Diskettes

Before using the SuperPak utilities, make a backup copy of the MS-DOS boot diskette. This way, you will have your original boot diskette in case you encounter any problems while preparing your diskette to include SuperPak programs.

Also make a copy of your *Enhanced Memory Expansion Software Expanded Memory & SuperPak Programs* diskette. Store away your original MS-DOS and SuperPak diskettes. In the rest of this section, your backup copies will be referred to as your *MS-DOS diskette* and your *SuperPak software diskette*.

### 2.2 Copying SuperPak onto an MS-DOS Diskette

To copy the SuperPak utilities onto your MS-DOS diskette, use the MS-DOS COPY command. The SuperPak software diskette is compatible with the COPY command of MS-DOS.

There are other files on your SuperPak diskette in addition to the three SuperPak utilities. The *READ.ME* file contains information about all the files on your diskette. You can list this file with an MS-DOS TYPE command. A word processing package can also be used to display or print out the file.

### 2.2.1 Copying the Entire SuperPak Diskette

If you want to copy ALL the programs from your SuperPak software diskette onto your MS-DOS diskette, proceed through the following steps. (You may also refer to the discussion of the COPY command in your *MS-DOS by Microsoft User's Guide*.)

#### STEP 1

*Write-protect your SuperPak software diskette:* Place a write-protect tab on your backup copy of the SuperPak software diskette. This will prevent accidental erasure during the copying process.

#### STEP 2

*Boot the system with your MS-DOS diskette:* This is done by placing the MS-DOS diskette in drive A: and pressing the keys <Ctrl>-<Alt>-<Del> or <RESET>.

#### STEP 3

*Copy the SuperPak diskette contents onto your MS-DOS diskette:* If you have only one floppy drive, enter:

```
A>COPY B:* A:<ENTER>
```

The system will prompt you to swap between the MS-DOS diskette and the diskette containing SuperPak software.

*If you have two or more floppy drives,* place the SuperPak diskette in drive B: and enter:

```
A>COPY B:* A:<ENTER>
```

By following STEPS 1 through 3, you will copy over all the programs on the diskette that contains the SuperPak utilities to your working MS-DOS diskette.

---

## 2.2.2 Copying the SuperPak Utilities

The file names for the SuperPak utilities are given in Table 2-1.

**Table 2-1. SuperPak Utility File Names.**

Utility Name	File Name
SuperDrive	SUPERDRV.COM
SuperSpool	SUPERSPL.COM
RAMDISK	RAMDISK.DEV

To copy the SuperPak utility programs from the SuperPak diskette onto an MS-DOS diskette, follow STEPS 1 to 3 given in Section 2.2.1. However, in STEP 3, substitute one or more of the following three COPY commands:

A>COPY B:SUPERDRV.COM A:<ENTER> (for SuperDrive)

A>COPY B:SUPERSPL.COM A:<ENTER> (for SuperSpool)

A>COPY B:RAMDISK.DEV A:<ENTER> (for RAMDISK)

## 2.3 AUTOEXEC.BAT and CONFIG.SYS Files

AUTOEXEC.BAT is the name of a batch file that MS-DOS searches for and executes whenever you start or restart your PC 6300/PC 6300 PLUS. You can initiate all the SuperPak utilities except RAMDISK automatically each time you start or restart your computer by placing commands needed to run those utilities in the AUTOEXEC.BAT file in your boot disk.

RAMDISK must be initiated by placing a command in the CONFIG.SYS file, which is also run automatically whenever your computer is started or restarted. The CONFIG.SYS file is used to vary the default hardware configuration for your

computer. Like the AUTOEXEC.BAT File, the CONFIG.SYS file on your boot diskette is automatically executed whenever you start or restart your computer.

One of several commands that can be included in a CONFIG.SYS file is the DEVICE command, that installs a device driver. A *device driver* is a program which helps your applications software use specific hardware you have in your computer. The DEVICE command is used to install RAMDISK, which is a device driver.

Your SuperPak diskette includes sample AUTOEXEC.BAT and CONFIG.SYS files for installing the SuperPak utilities that you can use as is or modify.

See Appendix B for information on how to create or modify an AUTOEXEC.BAT or CONFIG.SYS file.

## 2.4 Getting Acquainted with SuperDrive

The SuperDrive “electronic diskette drive” program can greatly enhance the processing speed of your PC 6300/PC 6300 PLUS. You can now assign random access memory (RAM) space for use as up to four SuperDrive electronic disk drives and retrieve data or programs at “RAM speeds”, much faster than a mechanical disk would allow.

Think of SuperDrive as a super-fast floppy disk drive. Once it has been created, you can COPY to it or COPY from it, ERASE files from it, run CHKDSK on it, or perform just about any other MS-DOS command with it. However, because SuperDrive is a program, just like a word processor or general ledger program, it must be “set up” each time you turn on the computer, and it will “go away” whenever the computer is turned off.



## 2.4.1 Features

SuperDrive includes these features:

- Allows simulation of up to four floppy disk drives.
- Allows a simulated floppy drive to be inserted between existing physical floppy drives.
- Allows you to define the size of simulated floppy drives and to reserve space for applications programs.
- Allows you to restrict SuperDrive operation to specific areas of memory.
- A PC 6300 supports single- and double-sided electronic drives, eight or nine sectors per track, and up to 360 kilobytes (KB) in size.
- A PC 6300 PLUS, supports 1.2-megabyte (MB) electronic drives, which are double-sided, have 80 tracks with 15 sectors per track.

Many of these features are provided by using the basic and advanced SuperDrive options described in Section 4.

### 2.4.2 Preparing PC 6300/PC 6300 PLUS Hardware for SuperDrive

This subsection describes how to prepare your PC 6300/PC 6300 PLUS for SuperDrive operation. Normally, you will have to do this only once. After you have set up the PC 6300/PC 6300 PLUS as described below, no further hardware preparation is necessary.

*Setting Switches for SuperDrive*

PC 6300/PC 6300 PLUS Motherboard Switch SW1 — Motherboard switch SW1 positions 7 and 8 are used to tell the computer how many floppy diskette drives are present. Because a SuperDrive is treated just like any other floppy drive, these switches must be set to reflect the total number of drives, including SuperDrives.

For example, if there is currently one floppy drive in your PC 6300/PC 6300 PLUS, motherboard switch positions SW1-7 and SW1-8 will probably be ON. If you intend to use two SuperDrive disk drives in addition to your floppy drive, you must tell the computer you have three drives, which would be SW1-7 ON and SW1-8 OFF.

Table 2-2 shows the SW1 switch settings and drive designations possible when using SuperDrive. In this table, “S-Drive” stands for SuperDrive.

**Table 2-2. Motherboard Switch SW1 Settings.**

Total No. of Drives	Motherboard Switch SW1		Possible Floppy and/or S-Drive Designations	AT&T Fixed Disk Designations
	7	8		
1	ON	ON	A: (No S-Drive)	C: etc.
2	OFF	ON	A: B:	C: etc.
3	ON	OFF	A: B: C:	D: etc.
4	OFF	OFF	A: B: C: D:	E: etc.

You can leave the switches set for three or four drives, even if you don't intend to always run with that many floppy drives and/or SuperDrives, or even if you occasionally work without SuperDrive. Of course, the system would then think there really are three or four drives and would accept commands

the operator might issue to the nonexistent drives. If this happens, the system is “smart” enough to recover from the error and will give the user an opportunity to abort the operation. However, to avoid false errors when running the diagnostics, you will probably want to set the switches back to the number of floppy drives in your system.

### **2.4.3 Basic SUPERDRV Command**

Because SuperDrive is a program, just like a word processor or general ledger program, it must be initialized each time you turn on your PC 6300/PC 6300 PLUS. The SUPERDRV command initializes SuperDrive for your PC 6300/PC 6300 PLUS. The simplest form of the SUPERDRV command is as follows:

**SUPERDRV C:<ENTER>**

This command creates a 360-KB double-sided, double-density SuperDrive C:. A minimum of 64 KB of memory is reserved for use by applications programs. This command can be placed in an AUTOEXEC file to initiate SuperDrive automatically when you start or restart the computer.

This may be all you need to know to run SuperDrive on your PC 6300/PC 6300 PLUS. Refer to Sections 3 and 4 if you wish to vary the basic SuperDrive configuration and/or memory allocation. The SUPERDRV command options described in Section 4 and the overview of memory allocation strategies in Section 3 provide information on how to modify the basic SuperDrive to meet special requirements.

Prepared AUTOEXEC files on your SuperPak diskette may provide ready-made command forms suited to your needs.

### 2.4.4 Sample SuperDrive Session

This section takes you step-by-step through the process of creating and using a SuperDrive. This example assumes that you have two double-sided floppy drives and that you want to create a double-sided SuperDrive as drive C:. You should have previously set up the motherboard switches or program for at least three drives.

#### STEP 1

*Create the SuperDrive:* Enter a command such as the following (this command can also be incorporated in your AUTOEXEC.BAT file to automatically create a SuperDrive every time you boot up your PC 6300/PC 6300 PLUS):

**SUPERDRV C:<ENTER>**

SuperDrive responds on the screen with a message similar to the one shown in Figure 2-1.

---

```
Super Drive                               Version x.x
(C) Copyright AST Research, Inc.
1983, 1984, 1985 all rights reserved

resident portion loaded

Drive =                                     C:
Buffer size =                               xxxxxx
Buffer start =                              xxxxxxh
Transfer length =                            xxxxxx

A>
```

**Figure 2-1. Sample SuperDrive Screen.**

where:

*Drive* = shows the letter designating the SuperDrive.

*Buffer size* = shows the capacity of the SuperDrive in bytes.

*Buffer start* = displays the hexadecimal starting memory address of SuperDrive.

*Transfer length* = shows the maximum number of bytes that can be transferred in or out of memory above 1 MB at one time. This line is only shown when the SuperDrive uses some memory at or above 1 MB.

If you received an error message while attempting to create a SuperDrive, refer to Section 4.6.

**STEP 2**

*Copy all of the files from drive A: to drive C:.* This step assumes that the diskette in drive A: contains all of the programs and data files that you want to copy to the SuperDrive.

**COPY A:\*\* C:<ENTER>** (to copy file by file)

or

**DISKCOPY A: C:<ENTER>** (if both drives are the same size)

**STEP 3**

*Change the default drive from drive A: to drive C:.*

**C:<ENTER>**

**STEP 4**

*Execute the program you want to run from the SuperDrive.*

**filename<ENTER>**

where filename is the name of the program.

That's all there is to it. Now you can treat the SuperDrive just like a floppy drive **WITH ONE EXCEPTION**. If you create any new data on the SuperDrive that you wish to save, copy it to a permanent storage medium when you are done (to either a floppy diskette or hard disk). **DATA STORED ON A SUPERDRIVE WILL BE LOST WHEN YOU TURN OFF YOUR COMPUTER!**

## 2.5 Getting Acquainted with SuperSpool

The SuperSpool program provides buffered output of print data to a parallel or serial printer while running other programs *at the same time*. Files to be printed will be output to the SuperSpool buffers at the maximum I/O speed allowed by MS-DOS, while SuperSpool handles output to the printer at printer speed. SuperSpool operates in the “background” and frees the operating system for other tasks, such as executing another program.

A simple example of one of the things you can do with SuperSpool is to print a listing of a BASIC program while running that same program on your PC 6300/PC 6300 PLUS. In effect, the BASIC program code is dumped into the print buffer, which then releases control of the program to the operating system.

### 2.5.1 Features

SuperSpool includes these features:

- Provides buffered output of print data to either a parallel or serial printer.
- Provides a simple command sequence that allows you to specify printer ports as well as serial output Baud rates and line conditions.
- Allows you to define the size of the spool buffer and control its location in memory.
- Allows stop/restart, previous page, and line-per-page controls to be invoked from the keyboard.
- SuperSpool’s “straight wire” spool buffer does not modify print file data.

- Compatible with MS-DOS, SuperDrive, and RAMDISK.
- Compatible with a PC 6300/PC 6300 PLUS with 128 KB, 256 KB, 512 KB, 640 KB, and 1 MB of memory installed on the motherboard.

Many of these features are provided by using the basic and advanced SuperSpool options described in Section 5.

### 2.5.2 Preparing MS-DOS for SuperSpool

If you are using SuperSpool with a parallel printer, before entering your SuperSpool command, enter the MS-DOS MODE command. (MODE.COM program comes with MS-DOS, and should be on your MS-DOS diskette.)

**MODE LPT1: <ENTER>**

The MS-DOS response is:

**LPT1: not redirected**

This response is normal and not an indication of an error. The MODE LPT1: command should be used even if you are using a serial printer. You only need to enter the MODE LPT1: command once at the start of each computing session.

### 2.5.3 Basic SUPERSPL Command

Because SuperSpool is a program, it must be initialized each time you turn on your computer. The SUPERSPL command initiates the SuperSpool utility and sets parameters for its operation. The basic forms of the SUPERSPL command for serial printers and parallel printers are given here.



---

The basic form of the SUPERSPL command for a parallel printer is:

**SUPERSPL LPT1: <ENTER>**

This command spools printer output to LPT1, the built-in parallel printer port on your PC 6300/PC 6300 PLUS. 64 KB is reserved for use by the spool buffer, and another 64 KB is reserved for use by applications programs.

The basic form of the SUPERSPL command for a serial printer is:

**SUPERSPL LPT1: = COM1:[/RATE = xxxx] <ENTER>**

The memory allocation for a serial printer is the same as for a parallel printer — 64 KB for the spool buffer and 64 KB minimum reserved for applications programs. COM1 is the built-in serial port on your PC 6300/PC 6300 PLUS.

This command spools printer output to serial port COM1 at even parity and 7 databits.

The Baud rate of the serial communication adapter must be specified (as 110, 150, 300, 600, 1200, 2400, 4800, or 9600 Baud). If the Baud rate is 110, the default stopbits value is 2. Otherwise, the default stopbits value is 1. The port line protocol options CTS and DSR are ON.

To change the values for features such as output port specifications, memory allocation, and serial printer configuration, many options are provided for adding to the basic command. These options are given in Section 5. Section 3 also provides pertinent information on memory allocation.

### 2.5.4 Sample SuperSpool Session

This sample session shows the step-by-step procedure to use in bringing up SuperSpool. This example assumes that the diskette in drive A: contains MODE.COM and SUPERSPL.COM. It also assumes that there is sufficient memory in the system to successfully execute the SuperSpool commands. The commands shown here can be placed in your AUTOEXEC.BAT file to initiate SuperSpool automatically each time you start or restart your PC 6300/PC 6300 PLUS.

#### STEP 1

*Prepare MS-DOS for SuperSpool by using the MODE command:*

```
A>MODE LPT1:<ENTER>
```

The MS-DOS response is:

```
LPT1: not redirected.
```

#### STEP 2

*Specify the SuperSpool command for your printer:* This example illustrates a command for a parallel printer.

```
A>SUPERSPL LPT1:<ENTER>
```

SuperSpool responds with a message similar to that shown in Figure 2-2, indicating that SuperSpool has loaded itself into memory.

```
Super Spool                               Version x.xx
(C) Copyright AST Research, Inc.
1983, 1984, 1985 all rights reserved

      resident portion loaded

Buffer size =                               xxxxxx
Buffer start =                             xxxxxxh
Transfer length =                           xxxxxx

LPT1: is ready
0 bytes buffered for output
```

**Figure 2-2. Sample SuperSpoolScreen.**

where:

*Buffer size* = tells how many bytes are reserved for the spool buffer.

*Buffer start* = is the hexadecimal address at which the SuperSpool buffer starts.

*Transfer length* = shows the maximum number of bytes that can be transferred in or out of memory above 1 MB at one time. This line is only shown if SuperSpool uses some memory at or above 1 MB.

*LPT1* is where spooling will be routed.

0 bytes of data are currently contained in the SuperSpool buffer (since nothing has been printed yet).

If a command had been given for a serial printer instead of a parallel printer, SuperSpool would also inform you that LPT1 is being redirected to COM1 or COM2. It would also tell you which of the signals DCD, DSR, CTS, and XON/XOFF are being monitored ("required ON for output").

### STEP 3

*Test the spooler:* Enter the Print Screen command (<Shift>-<PrtSc>). The cursor will "fly" down the screen as data is sent to the spool buffer, while SuperSpool outputs the data from the spool buffer to the printer at whatever rate the printer will accept it.

Now you can run whatever program you want and let SuperSpool handle output of data to the printer for you.

## 2.6 Getting Acquainted with RAMDISK

The RAMDISK program uses RAM to create an electronic, virtual hard disk unit in your PC 6300/PC 6300 PLUS. You can access RAMDISK faster than you would be able to access a disk unit peripheral. Furthermore, RAMDISK is designed to coordinate its operation with SuperDrive and SuperSpool while avoiding memory conflicts.

Because RAMDISK resides in RAM, information only resides in it while your PC 6300/PC 6300 PLUS is turned on. When the PC 6300/PC 6300 PLUS is off, all the information stored in RAMDISK goes away. Therefore, you must save RAMDISK data to a permanent storage medium such as a floppy diskette or a hard disk peripheral. Once installed, your RAMDISK is initialized each time you turn on your computer.

### 2.6.1 Features

RAMDISK includes these features:

- Allows great flexibility in the virtual disk's buffer size. The buffer size of the virtual disk is limited by the amount of RAM installed in your PC 6300/PC 6300 PLUS.
- Permits creation of multiple RAMDISK volumes. The number is limited only by MS-DOS.
- Can be installed purely through software. No hardware switch settings need to be changed in order to install RAMDISK.
- Allows you to define the size of applications program memory space and RAMDISK memory space. Sector size and the number of directory entries can also be specified.
- Allows you to restrict RAMDISK operation to specific areas of memory.
- Automatically creates a volume label for each RAMDISK. Also, each RAMDISK is automatically formatted.

Some of these features require using some of the basic and advanced command options described in Section 6.

### 2.6.2 Installing RAMDISK

To install the RAMDISK program on your PC 6300/PC 6300 PLUS, all you do is place a RAMDISK DEVICE command in the CONFIG.SYS file portion of MS-DOS on your boot diskette.

Once this is done, your computer automatically starts up or restarts with a RAMDISK electronic disk unit in operation.

The CONFIG.SYS file is part of MS-DOS that is executed each time you start or restart your PC 6300/PC 6300 PLUS. RAMDISK is a *device driver* program that is installed in the CONFIG.SYS file with an MS-DOS DEVICE command. Device drivers are programs which allow extra peripheral devices such as disk drives to be linked into MS-DOS.

To initiate RAMDISK for the first time, place a RAMDISK DEVICE command in the CONFIG.SYS file on your boot diskette and then restart your PC 6300/PC 6300 PLUS. After this, it will be initiated automatically each time your PC 6300/PC 6300 PLUS is started or restarted.

The DEVICE = RAMDISK.DEV command must follow any DEVICE commands in the CONFIG.SYS file that affect the functioning of RAMDISK. For example, if the AT&T Enhanced Memory Expansion product is being used, then DEVICE commands for the AEMM and AEX device drivers must precede the RAMDISK DEVICE command.

Refer to Appendix D for instructions on how to create or modify a CONFIG.SYS file.

### 2.6.3 Basic RAMDISK DEVICE Command

The basic form of the DEVICE command used to install a RAMDISK in the CONFIG.SYS file is as follows:

**DEVICE = RAMDISK.DEV**

---

If this command is placed in the CONFIG.SYS file, RAMDISK will operate with the following default parameters:

Sector Size = 128 bytes  
Directory Size = 64 files  
Disk Capacity = 512 KB  
Applications Program Space = 64 KB

In the default configuration, RAMDISK will use conventional memory (0 to 640 KB), not expanded memory.

#### NOTE

The default memory allocation to RAMDISK is 512 KB. If your PC 6300/PC 6300 PLUS has less than 512 KB of memory available for use as a RAMDISK, you can limit the size of RAMDISK using the `/M[=xxx]` option (described in Section 6.1.2).

If you wish to vary some of the operating parameters from the defaults shown above, you need to specify them in your DEVICE command for RAMDISK. The options allowing you to do this are described in Section 6.

The SuperPak diskette includes ready-made CONFIG.SYS files with RAMDISK DEVICE commands that are appropriate for use with certain PC 6300/PC 6300 PLUS configurations.

#### 2.6.4 SAMPLE RAMDISK SESSION

This subsection steps you through the process of creating and using a RAMDISK.

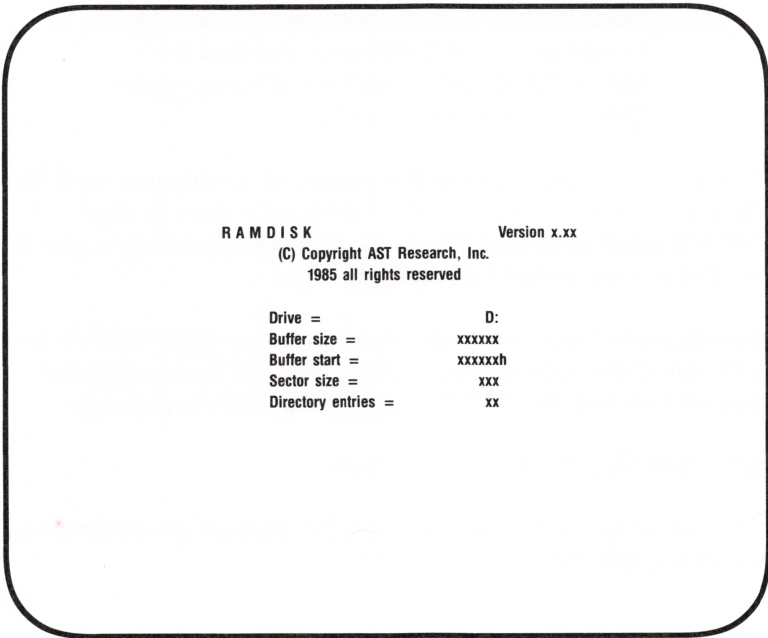
**STEP 1**

*Create a RAMDISK:* Enter a command such as the following in your CONFIG.SYS file. (If you have AEMM.SYS and AEX.SYS commands in your CONFIG.SYS file, then your RAMDISK command must follow them.)

**DEVICE = RAMDISK.DEV**

**STEP 2**

*Reboot your PC 6300/PC 6300 PLUS:* Press the <Alt>-<Ctrl>-<Del> key sequence. At the point at which the DEVICE command installing RAMDISK has just been executed by MS-DOS, RAMDISK responds on the screen with a message similar to the one shown in Figure 2-3.



**Figure 2-3. Sample RAMDISK Screen.**



---

where:

*Drive* = displays the letter designating the RAMDISK. In the sample screen above, the letter is D:. This letter is used to identify the RAMDISK in MS-DOS commands for copying files and running programs.

*Buffer size* = tells how many bytes are reserved for the RAMDISK buffer. The default is 524288 (512 KB).

*Buffer start* = is the hexadecimal address at which the RAMDISK buffer starts.

*Sector size* = shows the sector size in bytes. The default is 128 bytes. The sector size may be automatically adjusted to a different size than what is specified, in which case a message "adjusted" is displayed at the bottom of the display.

*Directory entries* = displays the maximum number of entries allowed in the root directory. The default is 64.

If your version of MS-DOS is earlier than 3.0, then the RAMDISK drive letter is not shown in the display. (The letter used is the first letter in the alphabet not already used for a diskette drive, SuperDrive, or other device. This is usually C: or D:, but may be E: or higher.) You can check the letter by using the MS-DOS DIR command, using the following command:

A> **DIR X:** <ENTER>

where X is any identifying letter.

If the drive specified in a DIR command is a RAMDISK, then the following response is returned:

**Volume in drive X is RAMDISKx.xx**

where x is a letter identifying the RAMDISK and x.xx is the version number of the RAMDISK program.

### STEP 3

*Use your RAMDISK:* For copying files and running programs, the command syntax is the same as for a diskette drive. To copy files from a diskette in drive A: to a RAMDISK C:, enter the following command:

**A>COPY A:\*\* C:<ENTER>**

Enter the initiating command from the C: prompt to run a program on RAMDISK:

**C>[initiating command]<ENTER>**

As with SuperDrive, any data stored on a RAMDISK must be saved to a permanent storage medium, such as a floppy diskette, before turning off your computer.

# MEMORY ALLOCATION

---

This section provides information on how to allocate memory to SuperDrive, SuperSpool, and RAMDISK to make the best use of your particular configuration. An overview of the memory regions recognized by these utilities is followed by a summary of the memory allocation options. Information and examples pertaining to memory allocation with several different configurations are also offered.

More detailed information on the command options for SuperDrive, SuperSpool, and RAMDISK are provided in Sections 4, 5, and 6, respectively. You may prefer to go directly to these sections dealing with specific utilities. However, if you plan to use more than one utility, then the general overview pertaining to all three utilities given in this section is helpful.

### 3.1 Memory Configuration

To make the most efficient use of all available memory, it helps to understand how SuperDrive, SuperSpool, and RAMDISK allocate memory.

There are several memory regions recognized by the SuperPak utilities that are affected by the memory allocation options. Your particular configuration may contain only some of these areas. The memory regions are as follows:

- *Low memory* — Memory in the range from 0 to 640 kilobytes (KB) without gaps in addressing, which is below the amount of system memory indicated by the motherboard switches. Some memory of this type is present in almost every configuration.

- *Extended memory* — Memory in the 1- to 16-megabyte (MB) address range on the Personal Computer 6300 PLUS (PC 6300 PLUS). Expanded memory can simulate extended memory when software needs to access extended memory (as described below).
- *Expanded memory* — AT&T's *Enhanced Expanded Memory* used to expand your computer's memory beyond 640 KB of system memory. This memory can be used for data storage by SuperDrive, SuperSpool, and RAMDISK when expanded memory is used as simulated extended memory by means of the AT&T Extended Memory Emulator (AEX) program. Expanded memory is only used if enabled by the `/EXTM` command option. The `/EXTM` option can be used on both the PC 6300 and the PC 6300 PLUS.

The following two memory regions are present in fewer PC configurations than the first three regions listed:

- *High memory* — Memory in the range from from 0 to 640 KB (without gaps in addressing), which is *above* the amount of system memory indicated by the motherboard switches.
- *Noncontiguous memory* — Memory above `:C0000` (hexadecimal) that begins after a gap in addressing in certain configurations of the 64-KB PC 6300 with the original Read Only Memory Basic Input/Output System (ROM BIOS) installed.

---

## 3.2 How SuperPak Utilities Allocate Memory

The following is a list of how the SuperDrive, SuperSpool, and RAMDISK utilities allocate memory in the regions listed above, shown in the order in which those regions are used.

1. Extended or expanded memory (used as extended memory) at or above 1 MB is used first if it is present and IF the */EXTM* option is in use. Memory is allocated from the lowest available memory above 1 MB upwards. Once the available memory in this area is exhausted, any additional memory needed is allocated from the next available area.

In addition to any extended/expanded memory being used, resident code for the utilities and an intermediate spooling buffer for SuperSpool will always be allocated below 1 MB.

2. Noncontiguous memory is used next if it is present. This memory is allocated starting at the highest end and working downward.
3. High memory is allocated next, if it is present. This memory is allocated starting at the high end and working downward.
4. Low memory is allocated last; in many cases this is the only type of memory present. SuperDrive, SuperSpool, and RAMDISK put themselves into low memory just above the operating system (MS-DOS) and displace the user's area upward toward the end of memory.

## 3.3 Memory Allocation Options

Optional command parameters can be used to alter the default amount and areas of memory allocated by the SuperPak utilities. A brief description of the memory allocation options follows. (More detailed descriptions are in Sections 4, 5, and 6). Each option described can be used in a command by adding it to the end of one of the basic command forms.

### 3.3.1 Allocating Memory to a Utility

SuperDrive, SuperSpool, and RAMDISK can use different forms of the */M=xxx* option (where xxx is a number of KB), to alter the default amount of memory allocated for their use. The option has a slightly different format and usage for each utility.

*With SuperDrive*, you can use the */M=xxx* option only to limit the memory allocation to less than the default size for its drive configuration. You cannot increase the amount of memory used beyond the drive configuration capacity (360 KB on the PC 6300 and 1.2 MB on the PC 6300 PLUS).

*With SuperSpool*, you can use the */M=xxx* option to decrease or increase the default size of the SuperSpool buffer (64 KB). The */M* form of the option can also be used to allocate all remaining available memory to the SuperSpool buffer.

*With RAMDISK*, you can use the */M=xxx* option to decrease or increase the default storage size of each RAMDISK (512 KB). As with SuperSpool, you can use the */M* form of the option to allocate all remaining available memory to RAMDISK.

---

### *Examples*

To create a double-sided, double-density SuperDrive with 200 KB of memory, and a SuperSpool with a 100-KB spool buffer (for a parallel printer), enter the following commands:

```
SUPERDRV C:/M = 200 <Enter>  
SUPERSPL LPT1:/M = 100 <Enter>
```

### **3.3.2 Reserving Memory for a Program**

You can use the */U = xxx* option (where *xxx* is a number of KB) to alter the default amount of memory (64 KB) reserved for an applications program. Usually, this option is used to reserve memory for an applications program *other* than a SuperPak utility. In this case, the */U = xxx* option should be the same in each SuperPak utility command. (Only the amount specified in the most recent command remains reserved.)

Occasionally, you may want to use the */U = xxx* option to reserve space for another SuperPak utility. In this case it is appropriate to specify different amounts of memory in different SuperPak utility commands.

For example, if you were to create a RAMDISK with an */M* option assigning it ALL available memory, you could reserve 400 KB for use with other utilities by adding the */U = 400* option. In a following SuperSpool command, you could then include the */M* and */U = 300* options in order to use ALL remaining memory (minus the 300 KB) for a SuperDrive.

### *Examples*

To reserve 150 KB for use with applications programs other than the SuperPak utilities while creating a 360-KB SuperDrive and a 100-KB RAMDISK, enter the following commands:

```
SUPERDRIVE C:/U = 150 <Enter>  
DEVICE = RAMDISK.DEV/M = 100/U = 150 <Enter>
```

### 3.3.3 Enabling and Disabling Memory Regions

Several options are provided to enable or disable the utilities from using the regions of memory described at the beginning of Section 3.1.

The */EXTM* option allows you to use expanded memory simulating extended memory. This option allows SuperDrive, SuperSpool, and RAMDISK to store data in expanded/extended memory above 1 MB. However, resident code for the three programs, and an intermediate buffer for SuperSpool, will still be located in memory below 1 MB.

Two optional numeric fields (the *xxxx*'s) can be used to limit the amount and range of memory above 1 MB available. The */EXTM[=xxxx[,xxxx]]* option form includes these two fields.

Once the */EXTM* option is invoked in one SuperPak utility command, all following RAMDISK, SuperDrive, and SuperSpool commands automatically apply the same option. However, you can use the */DEXTM* option in a later command to disable use of expanded/extended memory (only in the command that specifies */DEXTM*).

The */DL*, */DH*, and */DNC* options disable use of low, high, and noncontiguous memory, respectively. You can use these options with SuperDrive, SuperSpool, or RAMDISK commands. The */DL* option is the most frequently used of these three, since each PC 6300/PC 6300 PLUS configuration has some low memory in addition to any other memory regions it may have.

#### *Example*

To enable use of expanded memory above 1 MB for use with a 360-KB SuperDrive and disable use of any lower memory by SuperDrive (except lower memory needed for resident code), enter the following command:

```
SUPERDRV C:/EXTM/DL <Enter>
```



---

### 3.4 Planning Allocation for 1 MB or Less

Your PC 6300 may have up to 640 KB of total memory, while the PC 6300 PLUS may have 1 MB or less total memory. The following formula can help you to decide how to allocate your memory.

- xxxx KB Total actual memory installed (0 to 640 KB).
- 032 KB Approximate MS-DOS requirement.
- yyy KB Memory required by user program.
- =uuuu KB Memory available to SuperDrive, SuperSpool, and RAMDISK (approximate).

The memory allocation options that apply to this type of configuration are */U=xxx*, */M=xxx*, */DL*, */DH*, and */DNC*. If you have a PC 6300 PLUS, the */DH* option will not apply to you because there is no high memory on those configurations. Only a few configurations have noncontiguous memory. Examples follow of how these options can be used to allocate PC memory to the SuperPak programs.

#### NOTE

MS-DOS can only allocate 640 KB for user memory. If you have more than this installed, in your PC 6300 PLUS (for example, 1 MB), only 640 KB will be available for use by MS-DOS and the SuperPak utilities. The remaining 384 KB are fully utilized when running under UNIX™ System V. Therefore, if you have more than 640 KB, assume you have 640 KB of total memory for the purpose of these examples.

### 3.4.1 Memory Allocation Examples

The diagrams that accompany the following examples are intended for illustration purposes only. The relative memory area sizes are not necessarily depicted to scale. These examples assume that you are using MS-DOS.

#### *Example 1*

You have a PC 6300 PLUS with 640 KB total memory, and your motherboard switches are set at 640 KB. You have two double-sided floppies. You want to create two double-sided SuperDrives as drives C: and D:, and you need to reserve 128 KB for your applications program. Whatever is left is to be used as a spooling buffer. The equation would be:

640 KB	Total actual memory installed.
- 032 KB	Approximate DOS memory requirement.
<u>- 128 KB</u>	Memory required by user program.
= 480 KB	Memory available to SuperDrive, SuperSpool, and RAMDISK (approximate).

Since there is insufficient memory to create two, double-sided SuperDrives, we will create one full-sized drive and one smaller drive with the following commands.

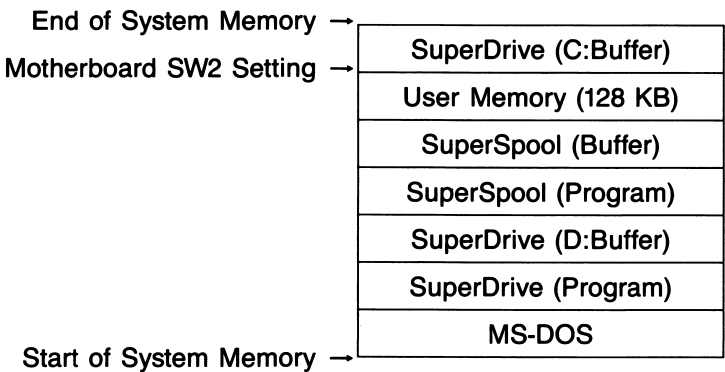
```
SUPERDRV C:/U = 128 <Enter>  
SUPERDRV D:/U = 128/M = 50 <Enter>  
SUPERSPL LPT1:/U = 128/M <Enter>
```

These commands will work in this priority:

1. Reserves 128 KB of memory (always in low memory) for your applications program.

2. Creates a double-sided SuperDrive as drive C:.. The resident (program) portion will be in low memory. The 360-KB drive is created first out of the remainder of high memory, then starts using low memory, pushing up the user memory area.
  
3. Creates a double-sided, 50-KB SuperDrive as drive D:.. Since the SuperDrive program code is already in memory, all that need be done is to create the buffer portion, which will locate immediately above the drive C: buffer. This again pushes up the 128-KB user memory area.
  
4. The size of the SuperSpool buffer (for LPT1) will be whatever memory space is left (via the /M option). The resident portion of SuperSpool will be located immediately above the drive D: buffer. The spool buffer will be above the resident portion of SuperSpool. The user memory is pushed up above everything else, to the end of memory as indicated by the switch settings.

Figure 3-1 illustrates memory allocation in Example 1.



**Figure 3-1. Memory Allocation (Example 1).**

### *Example 2*

You have 640 KB of memory installed, with your motherboard switches set for 512 KB. You have two double-sided floppies. You don't need SuperDrive this time, but you would like to use SuperSpool, and you want it to reside entirely in the memory above the switch settings so the full 512 KB will be available to your user program.

In this situation, the equation used in the first example no longer applies. Since there is 128 KB of memory above the switch settings, this is where the SuperDrive and/or SuperSpool programs will go first in allocating memory for their use. Through careful use of the /M=xxx option, we can restrict the programs to reside entirely in that high memory.

The following command will put both the resident portion of SuperSpool and a 29-KB spool buffer into high memory.

**SUPERSPL LPT1:/M = 29 <Enter>**

Why 29 KB? To allow room for the SuperSpool program itself (we allowed 3 KB in this example). We don't need /U=xxx this time since we are restricting the size and, therefore, the location of SuperSpool and its buffer. A better, more efficient way to accomplish this is:

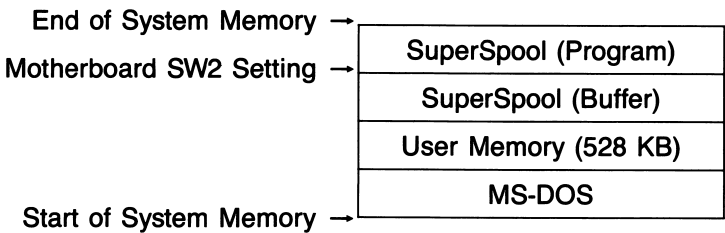
**SUPERSPL LPT1:/M/DL <Enter>**

SuperSpool should use every available byte of memory above the limit of the switch settings and is prevented from using any low memory by the /DL option.

You could force both SuperDrive and SuperSpool to reside entirely above the limit of the motherboard switch settings.

Begin by using the /M=xxx and /DL options with SuperDrive, then use /M and /DL with SuperSpool. One way to verify that you have not inadvertently started using low memory is to use the CHKDSK command before and after the SuperDrive and/or SuperSpool commands. If the memory parameters (bytes free) are not identical before and after installing your SuperDrive and/or SuperSpool buffers, you have used up some of the low memory.

Figure 3-2 illustrates memory allocation in Example 2.



**Figure 3-2. Memory Allocation (Example 2).**

### 3.5 Using AT&T Enhanced Expanded Memory

Adding an Enhanced Memory Expansion board to your computer can add up to 2 MB of *expanded* memory to your computer (depending on how much memory is on your board and how much of it is being used to round out the conventional memory).

If you have configured some of your expanded memory as extended memory (that is, you have installed the AEMM and AEX programs), then you can use it as data storage space for the SuperDrive, SuperSpool, and RAMDISK utilities. All the memory allocation options can be used in this configuration. You must use the /EXTM option to enable use of expanded

memory simulating extended memory by the SuperPak programs. Refer to the *AT&T Enhanced Memory Expansion Board User's Guide* for further details on how the board's software works.

### 3.5.1 The AEMM and AEX Device Driver Programs

In order for the SuperPak utilities to access expanded memory, the AT&T Expanded Memory Manager (AEMM) and AT&T Extended Memory Emulator (AEX) device driver programs must be installed on your PC. AEMM allows applications software to use enhanced expanded memory. AEX acts as an interface to software designed for use with extended memory (such as the */EXTM* option for the SuperPak utilities), and allows it to use expanded memory by means of the AEMM software.

The program files for both must be present on your boot diskette, and DEVICE commands to install each must be added to the CONFIG.SYS file section of MS-DOS on your boot diskette. (CONFIG.SYS files are described in Section 2.3.) The DEVICE command to install AEMM must precede the DEVICE command for AEX.

The AEX DEVICE command includes a parameter which indicates the maximum number of KB which can be used by programs (including the SuperPak utilities) accessing AEX. The default value is 512 KB. This parameter must be large enough to include any expanded memory to be used by SuperPak utilities.

#### NOTE

Refer to the software installation section of your *AT&T Enhanced Memory Expansion Board User's Guide* for information on AEMM and AEX installation.

---

Table 3-1 lists the file names and sample DEVICE commands for AEMM and AEX.

**Table 3-1. AEMM and AEX Descriptions.**

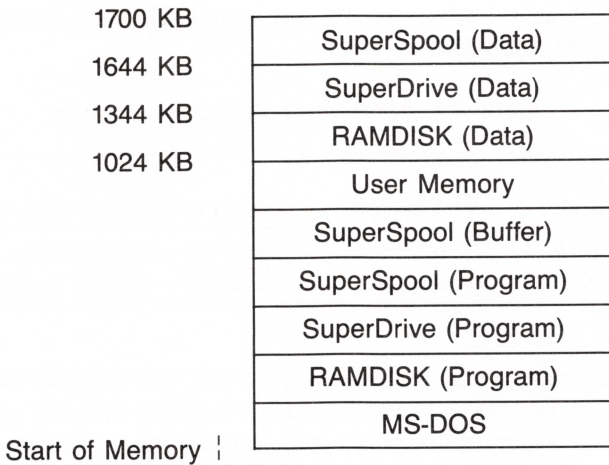
<b>Program Name</b>	<b>File Name</b>	<b>Sample DEVICE Command</b>
AEMM	AEMM.SYS	DEVICE = AEMM.SYS
AEX	AEX.SYS	DEVICE = AEX.SYS 1024

If the commands in the table were used, then SuperPak utilities would be able to access a maximum of 1 MB of available expanded memory (provided by the parameter 1024).

### **3.5.2 Expanded Memory Allocation Example**

#### *Example 1*

This example shows how memory allocation could be accomplished with expanded memory with the system running under MS-DOS. Here, RAMDISK is running in the first 320 KB of expanded memory above 1 MB. SuperDrive and SuperSpool are also located in expanded memory above RAMDISK, from 1344 to 1700 KB. In this example, AEMM and AEX must be installed, and AEX must be allocated at least 700 KB of memory. Figure 3-3 illustrates memory allocation in Example 1.



**Figure 3-3. Expanded Memory Allocation.**

The commands used to achieve this memory allocation follow:

Enter the following command in the CONFIG.SYS file:

**DEVICE = RAMDISK.DEV /EXTM/M = 320**

Enter the following SuperSpool and SuperDrive commands:

**SUPERDRV C: /M = 300**

**SUPERSPL LPT1:/M = 56**

No special device drivers need to be installed in order to use PC 6300 PLUS extended memory.



This section provides the optional parameters that can be used to modify the basic SUPERDRV command described in Section 2.4.4. These options are divided into the basic options used most often, and the less frequently used advanced options. In addition to command options, this section also includes examples, error messages, and application notes describing how to handle particular situations when using SuperDrive.

Before creating any SuperDrives using the options described here, read Section 2.4 for background information such as how to prepare your PC 6300/PC 6300 PLUS hardware to create virtual diskette drives.

Table 4-1 lists the beginning and advanced options that can be used in a SuperDrive command. It provides a brief description of each option's function and the section number where the option is discussed in detail.

**Table 4-1. SuperDrive Options Summary.**

Option	Function	Section
<b>Beginning Options</b>		
/?	Displays help screen with option descriptions.	4.1.1
n:	Designates SuperDrive letter.	4.1.2
/I	Inserts a SuperDrive between other diskette drives.	4.1.2
/U	Reserves memory for use by other programs.	4.1.3
/M	Limits memory allocation to SuperDrive.	4.1.3
/EXTM	Enables use of extended memory by SuperDrive.	4.1.3
/DEXTM	Disables use of extended memory by SuperDrive.	4.1.3
<b>Advanced Options</b>		
/1	Creates a single-sided, 180-KB SuperDrive.	4.3.1
/4	Creates a double-sided 360-KB SuperDrive (same as default), option format.	4.3.1
/8	Changes number of sectors per track from 9 to 8.	4.3.2
/15	Creates a 1.2 megabyte (MB) SuperDrive on a PC 6300 PLUS.	4.3.2
/TSIZE	Changes number of bytes of data transferred in and out of extended memory.	4.3.3
/DH	Disables use of high memory by SuperDrive.	4.3.3
/DL	Disables use of low memory by SuperDrive.	4.3.3
/DMMGMT	Disables calls from SuperDrive to memory management.	4.3.3

---

## 4.1 Basic SUPERDRV Options

The basic SUPERDRV command options are shown below, using the format notation described in Section 1.5.1:

```
SUPERDRV n:[/?][I][U = xxx][M = xxx][EXTM[ = xxxx[,xxxx]]  
[DEXTM] <Enter>
```

Note that each parameter except “n” is optional, and that each optional parameter (enclosed in brackets) is preceded by a slash (/). The optional parameters can be placed in any order after the colon (:). *Do not use spaces or commas to separate options.*

The SUPERDRV command invokes the SuperDrive program's command handler routines (SUPERDRV.COM must be resident on your operating system diskette). The options shown in the command line above are described in the following subsections on configuring the drive and allocating memory to SuperDrive.

### 4.1.1 Help Option

**[/?]**

This option displays a help screen that lists the available options for the command line. Do not use this option in an AUTOEXEC file to install SuperDrive. Use the /? option by itself to check on the available command options, in the following command form:

```
SUPERDRV /? <Enter>
```

### 4.1.2 Drive Configuration Option

*n:*

Denotes the drive to be simulated in random access memory (RAM) and is immediately followed by a colon. The only valid drive letters are A:, B:, C:, or D:.

*[/I]*

This option logically inserts a SuperDrive as drive *n:*. Any physical disk drive or SuperDrive currently defined as drive *n:* will be “pushed up” one drive position. For example:

#### **SUPERDRV A:/I**

defines SuperDrive as drive A: and causes the current drive A: (whether a SuperDrive or a floppy drive) to become drive B:, drive B: becomes drive C:, and so forth. Other drives which come logically after the inserted drive will also be pushed up one position. Remember that MS-DOS will support only four drives (A:, B:, C:, and D:).

#### **CAUTION**

Do not configure a SuperDrive disk unit in place of a real physical drive without using the */I* option, or you will not be able to access the real physical drive until the system is rebooted.

### 4.1.3 Memory Allocation Options

*[/U = xxx]*

This option reserves a minimum of xxx KB of memory for an applications program and its work space that the SuperDrive program will not use. This is the area of memory in which your applications program will run. For

---

example, if the instructions to your word processing program say that it needs 128 KB to run, you would use a value of `"/U = 128"`. If no `/U = xxx` parameter is specified, SuperDrive will reserve a minimum of 64 KB for applications program use.

The value specified by `/U = xxx` is only a minimum; there may be more available if you have not allocated all other memory to SuperDrive, SuperSpool and/or RAMDISK. After creating your SuperDrives, you can verify how much user memory is available by using the CHKDSK function.

If you are using the `/U = xxx` option to reserve space for an applications program other than another SuperPak utility, you must use the exact same `/U = xxx` parameter in all SuperDrive, SuperSpool, and RAMDISK command parameters. The value specified by the `/U = xxx` option has priority over all other memory allocation.

You can use this option to reserve space for another SuperPak utility. If this is done, then the `/U = xxx` parameter will be smaller in subsequent utility commands, since they will be using some of the space reserved in the first command.

#### `[/M = xxx]`

This option reserves xxx KB of memory for SuperDrive use. Your applications program does not use this memory. The `/M = xxx` option is used to limit the size of your SuperDrive to less than the default amount appropriate for its drive configuration, but it cannot increase the size of your SuperDrive beyond the default.

By default, your SuperDrive will have a storage size of 360 KB, appropriate for its configuration. The `/M = xxx` option can be used to create a SuperDrive smaller than 360 KB. (Different amounts of memory may be allocated by default if the advanced options /1, /4, and /15 discussed in Section 4.3 are used.)

The */M = xxx* option specifies the maximum amount of memory that will be allocated to the selected SuperDrive and can be used to create multiple SuperDrives of specific capacities.

The actual amount of memory used for the SuperDrive will be slightly more than the value specified by */M = xxx*.

*[/EXTM[ = xxx[,xxx]]]*

This option is available only on a PC 6300/PC 6300 PLUS with an AT&T Enhanced Memory Expansion board and software. This software includes the AT&T Expanded Memory Manager (AEMM) and AT&T Extended Memory Emulator (AEX). (Refer to Section 3.5 for further information on using SuperPak with AT&T's Enhanced Memory Expansion product.)

This option enables use of available memory at or above 1 MB by SuperDrive. Memory in the first MB can also be used if necessary. Usually, */EXTM* is specified without any numeric fields, allowing your SuperDrive to use any available memory at or above 1 MB.

The amount of memory actually used by SuperDrive is determined by the drive configuration or the */M = xxx* option, whichever is smaller. The default drive configuration is 360 KB for each SuperDrive. (The default amount of memory allocated to SuperDrive may differ if the advanced drive configuration or sectors per track options described in Section 4.3 are used.)

Once you have used a form of the */EXTM* option with a RAMDISK, SuperDrive, or SuperSpool command, then that same option is automatically applied to any following SuperDrive, SuperSpool, or RAMDISK commands — UNLESS one of those commands disables use of the */EXTM* option with the */DEXTM* option.

To avoid possible conflicts with some applications programs, two numeric fields are provided to allow you to restrict the amount and range of expanded memory that SuperDrive can use. *The first field (four xs) represents the number of 1-KB blocks at or above 1 MB of memory that SuperDrive can use.* If you want to specify an offset without restricting the amount of memory to be used, specify a 0 in this field (0 indicates no limit, the default).

*The second field (four xs) indicates a starting offset for the portion of memory above 1 MB that SuperDrive can use.* The default value is 1024 (1 MB). Any offset specified should be at least 1024 since this is where memory above 1 MB begins.

An offset can be specified to keep SuperDrive from conflicting with other software using memory above 1 MB. No such conflict occurs between SuperDrive and SuperSpool or between SuperDrive and RAMDISK.

If RAMDISK is operating in extended memory, then you should always place the memory used by SuperDrive after that program. For example, if it is operating in the first 800 KB of memory over 1 MB (address 1024 to 1824 KB), and all of the remaining memory is to be available for use by RAMDISK, SuperDrive, and SuperSpool, then the parameter specified should be `/EXTM=0,1824` (since  $1024 + 800 = 1824$ ).

#### `[/DEXTM]`

Once the `/EXTM` option has been invoked in a previous command, this option can be used to disable use of extended memory in the command it appears in. Once it has been used, `/EXTM` enables extended memory use in any subsequent commands that do not include `/DEXTM`.

## 4.2 Basic SuperDrive Examples

The following examples demonstrate how to use the SUPERDRV command (for a step-by-step example of how to create and use SuperDrive, see Section 2.4).

The first three examples assume you have a system with one floppy drive (physical drive A:); are running with either a 64-KB motherboard or a 256-KB motherboard and MS-DOS 2.0 or later; have set your motherboard switches for a total of three floppy drives; and have sufficient memory to successfully execute the commands without error (Section 4.6 discusses SuperDrive error messages).

### *Example 1*

In the following example, the first command adds one double-sided SuperDrive as drive B:. SuperDrive B: replaces physical drive B:. Physical drive B: is no longer accessible.

The second command causes drive C: to become a double-sided SuperDrive. By default, each SuperDrive is allocated 360 KB of memory. A total of 64 KB of memory is allocated for an applications program.

```
SUPERDRV B: <Enter>  
SUPERDRV C: <Enter>
```

### *Example 2*

The following command allocates a minimum of 64 KB of memory for an applications program. It inserts a double-sided, 360-KB SuperDrive as drive A:. Physical drive A: becomes drive B:. Physical drive B: becomes drive C:. This command cannot be used in an AUTOEXEC file.

```
SUPERDRV A:/I <Enter>
```



---

*Example 3*

In this example, the first command inserts an 80-KB double-sided SuperDrive as drive B:. The second command adds drive D: with a 100 KB capacity in double-sided format. The same */U = xxx* parameter must be used in each command, allocating at least 128 KB of memory for an applications program.

```
SUPERDRV B:/I/U = 128/M = 80 <Enter >  
SUPERDRV D:/U = 128/M = 100 <Enter >
```

#### 4.2.1 SuperDrive Examples Using Extended Memory

The following examples use the */EXTM* option. This option is provided for use in systems with AT&T's enhanced expanded memory.

*Example 4.*

The following command enables SuperDrive to use memory above 1 MB. It creates (by default) a double-sided SuperDrive C: with 360 KB of memory.

```
SUPERDRV C:/EXTM
```

*Example 5*

The following command enables SuperDrive to use 200 KB of memory above 1 MB. The command creates a double-sided, 360-KB drive C:, which will use 160 KB of memory below 1 MB to provide the remaining memory needed for the SuperDrive.

```
SUPERDRV C:/EXTM = 200
```

*Example 6*

In this example, the first command enables SuperDrive to use 400 KB of memory above 1 MB, starting at an offset of 1824 KB. It defines a 300-KB drive by use of the */M* parameter. The 300-KB drive is allocated entirely within memory above 1 MB.

The second command initiates SuperSpool and also uses memory above 1 MB. Because only 400 KB of memory above 1 MB can be used, SuperSpool will look for 100 KB of memory from the first 1 MB for use as part of the 200 KB of storage allocated by the SUPERSPL command.

```
SUPERDRV C:/EXTM = 200,1824/M = 300 <Enter>  
SUPERSPL LPT1:/M = 200 <Enter>
```

### 4.3 Advanced SUPERDRV Options

The entire SUPERDRV command follows. The advanced options are highlighted in color and shown in the order in which they are described.

```
SUPERDRV n: [I]/U = xxx]/M = xxx]/EXTM[ = xxx[,xxxx]]]/DEXTM  
[I]/4]/8]/15]  
[TSIZE = xxx]/DH]/DL]/DNC]/DMMGMT] <Enter>
```

The SUPERDRV command is actually entered on one continuous line which may wrap around to a second line. (Options are shown on several lines here to indicate option groupings.)

You can use the advanced SUPERDRV command options to create special drive configurations such as single-sided drives; to vary the number of sectors per track to create the 1.2 MB drives used on the PC 6300 PLUS; to disable use of low-, high-, or noncontiguous memory, and MS-DOS memory management on computers with special types of memory configurations.

---

### 4.3.1 Advanced Drive Configuration Options

[/1]

This option creates a single-sided drive. The default size for a single-sided drive is 180 KB. To specify a nonstandard capacity, see the `/M=xxx` option in Section 4.1.3.

[/4]

This option can be entered on any PC. It creates a standard double-sided drive with a default size of 360 KB.

### 4.3.2 Sectors Per Track Options

[/8]

This option specifies 8 sectors per track. If this option is omitted, a value of 9 sectors per track will be used.

[/15]

This option specifies 15 sectors per track and configures the drive to create a high-density drive with 1.2 MB of memory, using 15 sectors per track and 80 tracks. MS-DOS will recognize a 1.2-MB high density drive only when using MS-DOS 3.x or later.

### 4.3.3 Advanced Memory Management Options

[/TSIZE=xxxxx]

This option is used only when part of the SuperDrive is in memory at or above 1 MB (when the `/EXTM` option described in Section 4.1.3 has been used). The `TSIZE` option sets the maximum number of bytes of data that can be transferred in and out of memory above 1 MB at a time. You can supply any value from 16 bytes to 32 KB with this parameter. The default value for transfer size is 2048 bytes.

The number of bytes you supply with this parameter is rounded down to the nearest multiple of 16 by SuperDrive to yield the actual transfer size, so it is advisable to supply a multiple of 16.

This option may affect interrupt handling since interrupt handling may be suspended while data transfers take place. If interrupts are being lost, then TSIZE should be decreased.

The following options are for users who have memory installed in their computer which is above the amount for which their system board switches are set (expanded, extended, or high memory), or for users who have noncontiguous memory at hexadecimal address :C0000 or higher.

**[/DH]**

This option (Disable High-Memory Use) prevents SuperDrive from using any portion of contiguous memory which might be available above the limit set by the motherboard switches. (Only PCs with 64 or 256 KB installed on the motherboard have high memory.) It does not, however, prevent them from using any noncontiguous memory which may be present beginning at hexadecimal address :C0000, or from using memory available below the switch settings. It has no effect if there is no contiguous memory available above the switch settings.

**[/DL]**

This option (Disable Low-Memory Use) prevents SuperDrive from using any portion of user memory; that is, contiguous memory below the limit set by the system board switches. It restricts them to using only memory available above the switch settings. If noncontiguous memory is available beginning at hexadecimal address :C0000, it is used first. This implies that there must be memory available above the switch settings in order to use this option.

---

***[/DNC]***

This option (Disable Noncontiguous Memory Use) prevents SuperDrive and SuperSpool from using any noncontiguous memory which may be available beginning at hexadecimal address :C0000. If contiguous memory is available above the limit set by the switch settings, it is used first.

***[/DMMGMT]***

This option (Disable Memory Management) disables calls to MS-DOS memory management. Normally the SuperDrive program will call MS-DOS memory management in an attempt to acquire any additional, unused memory. Using */DMMGMT* prevents SuperDrive from acquiring additional memory from MS-DOS.

You would use this option to ensure that SuperDrive does not use any unallocated memory that you may want to subsequently allocate to other programs. MS-DOS memory management does not allocate high- or noncontiguous memory.

## 4.4 Advanced SuperDrive Examples

The following examples combine some of the required basic options described in Section 4.1 with several of the advanced options listed in this section.

***Example 1***

The following command allocates a minimum of 64 KB of memory (by default) for applications programs. It also adds one single-sided SuperDrive as drive C:.

**SUPERDRV C:/1 <Enter>**

*Example 2*

The following command allocates a minimum of 256 KB for applications program memory. It creates a single-sided, 100-KB SuperDrive as drive C:. It also restricts SuperDrive from using any contiguous memory which may be available above the limit set by the switch settings.

**SUPERDRV C:/1/U = 256/M = 100/DH <Enter>**

*Example 3*

The following command allocates a minimum of 320 KB for applications program memory. It creates a double-sided SuperDrive as drive C:. It also prevents SuperDrive from using any part of contiguous memory below the setting of the motherboard switches.

**SUPERDRV C:/2/U = 320/DL <Enter>**

*Example 4*

In the following example, the first command allocates a minimum of 64 KB for applications program memory. It also creates a single-sided, 100-KB SuperDrive as drive C:.

The second command creates a double-sided (by default), 50-KB SuperDrive as drive D:. It prevents SuperDrive from using any noncontiguous memory (if there is any available) and prevents it from using any contiguous memory available below the switch settings. This implies that there must be sufficient contiguous memory available above the switch settings (high memory) to successfully perform both of these commands.

**SUPERDRV C:/1/M = 100/DL/DNC <Enter>**  
**SUPERDRV D:/M = 50/DL/DNC <Enter>**

---

*Example 5*

In the following example, the first command allocates a minimum of 384 KB of memory for applications program memory. It creates a standard, single-sided SuperDrive as drive B:, located in noncontiguous memory. Physical drive B: is no longer accessible.

The second command creates a single-sided SuperDrive as drive C: located in noncontiguous memory. Its size will be what is left over there from the previous command (around 30 KB when the maximum 192 KB was available).

The third command creates a standard, single-sided SuperDrive as drive D:. Since noncontiguous memory has been exhausted from the previous two commands, drive D: will be located in contiguous memory above the switch settings of the motherboard.

```
SUPERDRV B:/1/U = 384/DH/DL <Enter>  
SUPERDRV C:/1/U = 384/DH/DL <Enter>  
SUPERDRV D:/1/U = 384/DL <Enter>
```

*Example 6*

The following command creates a double-sided SuperDrive B: (the disk size defaults to the standard 360-KB disk size), reserves 256 KB for the applications program, and disables calls to MS-DOS memory management.

```
SUPERDRV B:/2/U = 256/DMMGMT
```

## 4.5 SuperDrive Application Notes

Some suggestions follow for how to use SuperDrive to the best advantage in certain situations. For example, using SuperDrive with overlay software and using SuperDrive on a single-drive PC.

A crucial fact to remember when using SuperDrive is that since any data stored on a SuperDrive is actually stored in RAM, it will be lost if there is a power failure or whenever you turn the computer off or reboot the system. Only noncritical files should be stored on a SuperDrive disk drive. This protects you in the event of a power outage.

### 4.5.1 Using SuperDrive with Overlay Software

One of the most common and useful applications of SuperDrive uses the electronic disk to store multipart applications programs which use “overlays”. For example, if your applications software is menu-driven or option-oriented, it probably consists of several different programs, each corresponding to an option. When you choose an option, the appropriate program is loaded into RAM from disk. Word processing programs are excellent examples of overlay software. Switching between options, menus, formats, or other logical program divisions can be a time consuming “wait for the disk drive” experience.

By copying such programs to a SuperDrive disk and executing them from SuperDrive, the transition time between the various options becomes virtually unnoticeable. We recommend that you store your data files directly to a floppy diskette in case of power failure. This gives you maximum speed while maintaining maximum data integrity.

### 4.5.2 Protecting Important Data Files

If you do elect to store data files on a SuperDrive, you may want to execute your applications program from a .BAT (batch) file such as the one illustrated below. We suggest you add a command to the .BAT file immediately following the command to run your program, which will transfer (COPY) your data file(s) from the SuperDrive back over to a floppy. Thus, as



---

long as you take an orderly exit from your program back to MS-DOS, the .BAT file will automatically take control and copy your data files to a floppy diskette.

For example, let's say your program and data files are all contained on drive A: and you want to run this program on a SuperDrive as drive C:, modify the data file also on drive C:, exit to MS-DOS when finished, and have your data file copied back to floppy drive A:. The .BAT file on your boot diskette in drive A: might look like this:

**SUPERDRV C:**

**COPY A:\*.\* C:** (copy all files from drive A: to drive C:)

**C:** [name of applications program to run from drive C:]

**COPY C:\*.\* A:** (copy all files from drive C: to drive A:)

Now, when you exit your applications program and return to MS-DOS, everything on the SuperDrive disk (drive C: in our example) will automatically be copied to your floppy diskette in drive A:.

#### **4.5.3 Creating SuperDrive A: from an AUTOEXEC File**

MS-DOS will not let you create a SuperDrive as drive A: from an AUTOEXEC file. (Appendix B describes AUTOEXEC files.) However, you can circumvent this problem. The following two batch files illustrate how to do this. Again, this assumes you have two physical drives, A: and B:. A number of other commands have been included to illustrate what you can do with batch files. For convenience, the exact keyboard

commands to use when creating these two batch files are included.

**COPY CON: AUTOEXEC.BAT <Enter>** This file resides on the  
**MODE LPT1: <Enter>** diskette in drive A: (the  
**B: <Enter>** boot diskette) at the  
**MAKE-A <ENTER>** time the system is  
**F6 > <Enter>** booted.

**COPY CON: MAKE-A.BAT <Enter>** This file resides on  
**SUPERDRV A:/I <Enter>** the diskettes in both  
**SUPERSPL LPT1: <Enter>** drives A: and B: at the  
**COPY B:\*\* A: <Enter>** time the system is  
**A: <Enter>** booted.  
**[command to execute applications program from A:] <Enter>**  
**<F6> <Enter>**

This method requires that at boot time, the diskette in drive A: contains all of the programs that you want to execute from the SuperDrive drive A:, and that both drives A: and B: contain the above file MAKE-A.BAT. The diskette in drive B: contains SuperDrive and SuperSpool.

#### 4.5.4 Single-Drive Systems

If you have only one physical drive but your motherboard switches are set for two or more drives and you wish to use the DISKCOPY command to copy a floppy diskette, be sure to specify drive A: as both the source and target diskette (**DISKCOPY A: A:**). You can, of course, DISKCOPY to and from a SuperDrive if it is the same size as your physical drive A:.

If you want to use the COPY command to move files from one diskette to another, you will have to use the command in conjunction with SuperDrive. COPY the file(s) you want to transfer from drive A: to SuperDrive B:, insert the actual destination diskette in drive A:, and COPY back from drive B: to drive A:.

---

### 4.5.5 Using MS-DOS Commands with SuperDrive

When you create a SuperDrive, think of it as a formatted data disk without MS-DOS installed on it. The process of creating the SuperDrive automatically formats the SuperDrive so that you do not need to execute a MS-DOS FORMAT command as a separate operation.

All other MS-DOS commands will function on a SuperDrive just as they do on a real floppy drive. However, you can use the DISKCOPY command only if your floppy diskette and your SuperDrive are identical in size. If you have single-sided drives, you will not be able to use the DISKCOPY command to copy double-sided diskettes. However, you can use double-sided drives to DISKCOPY single-sided diskettes.

You can perform simple MS-DOS commands in between creation of multiple SuperDrives. For example, you can use the following command sequence:

```
SUPERDRV A:/I  
COPY B:** A:  
SUPERDRV B:/I  
COPY D:** B:
```

Do not execute applications programs in between creation of multiple SuperDrives.

### 4.5.6 SuperDrive Compatibility

As a general rule, if the program you want to use with SuperDrive will allow itself to be copied to a floppy drive, it can also be copied to and executed from a SuperDrive. If, on the other hand, your program is currently stored on a copy-protected diskette, you will probably not be able to use it with SuperDrive.

If your program is currently executed from an AUTOEXEC file on a boot diskette, and you want to modify it to run with SuperDrive, you will have to modify the AUTOEXEC file. (See Appendix B for instructions on how to modify an AUTOEXEC file.) You need to place your SuperPak commands *before* your program commands in the AUTOEXEC file in order for the programs to use the SuperPak utilities.

Some programs insist upon accessing a specific drive even though the default drive has been changed to something else. If this is the case for your program, you will have to configure your SuperDrive(s) to be the same designation as that which the program expects.

## 4.6 Error Messages

SuperDrive gives you an error message under certain conditions. These messages are described below.

### INVALID DRIVE SPECIFICATION . . . ABORTING

**Explanation:** This message indicates that either the motherboard switches were not set for the correct number of drives (see Section 2.4), or you used an invalid drive letter in your SuperDrive command.

### INSUFFICIENT MEMORY . . . ABORTING

**Explanation:** This message indicates that there is insufficient unallocated memory available in the system to create a SuperDrive of any size.

**SHORT xxxxxx BYTES**

**Explanation:** This is not really an error message. It indicates that the SuperDrive you have just created is less than a standard-sized drive in size. This could happen if you use the `/M=xxx` option to create a nonstandard drive, or if there were some memory available, but not quite enough to make the drive exactly the size you specified.

If you receive an error message other than those above while trying to initialize SuperDrive, it may be an MS-DOS error message. See the appropriate MS-DOS manual for a description.

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## SECTION 5

### SUPERSPOOL

---

This section provides the options that can be used to modify the basic SUPERSPL command described in Section 2.5. These options are divided into the basic options used most frequently, and the less frequently used advanced options. In addition to the command options, this section also includes example command forms and application notes describing how to handle particular situations when using SuperSpool.

Before initiating SuperSpool with one of the command forms described in this section, be sure to read Section 2.5 for essential background information, such as how to enter an MS-DOS MODE command before each SuperSpool session.

The SUPERSPL command options vary depending on the type of printer (serial or parallel) to which you are sending output.

Table 5-1 lists the beginning and advanced options that can be used in a SuperSpool command. Except where noted, these options apply to both parallel and serial printers.

**Table 5-1. SuperSpool Options Summary.**

Option	Function	Section
<b>Beginning Options</b>		
/?	Displays help screen with option descriptions.	5.1.1
LPTn:	Selects one of three parallel ports.	5.1.2
COMn:	Redirects parallel printer output to a serial port (serial printer only).	5.1.2
/U	Reserves memory for use by another program.	5.1.3
/M	Varies the default (64 KB) memory allocation to the SuperSpool buffer.	5.1.3
/EXTM	Enables use of extended memory by SuperSpool.	5.1.3
/DEXTM	Disables use of extended memory by SuperSpool in the current command.	5.1.3
/Rate, parity, databits, stopbits	Sets serial printer configuration parameters (serial printer only).	5.1.2
/ON,/OFF	Turns on and off port line protocol options (serial printer only).	5.1.4



**Table 5-1. SuperSpool Options Summary (Continued).**

Option	Function	Section
<b>Advanced Options</b>		
/TSIZE	Varies the number of bytes of data transferred in and out of extended memory at a time.	5.3.1
/DH,/DL, /DNC	These options disable use of high-, low-, or noncontiguous memory, respectively.	5.3.1
/DMMGMT	Disables MS-DOS memory management calls.	5.3.1
/DBI	Disables the Block Transfer Interface.	5.3.2
/LPP	Sets number of lines per page.	5.3.3
/FF	Sends formfeed to printer.	5.3.4
/STRING	Sends characters to printer.	5.3.4
/S,/C	Stops and continues output of print data, respectively.	5.3.4
/P	Purges all data from the SuperSpool buffer.	5.3.4
/B,/R,/RP	Page reprint options.	5.3.5
/PINT	Changes the default IRQ (parallel printer).	5.3.6
/SINT	Changes the default IRQ (serial printer).	5.3.7

## 5.1 Basic SUPERSPL Command Options

The basic options available for the SUPERSPL command are shown in the following command lines, one for parallel printers and one for serial printers. The format notation used in the command line is explained in Section 1.5.1. (More advanced options are provided later in this section.)

The basic SUPERSPL command options for a parallel printer are as follows:

```
SUPERSPL LPTn: [?][U = xxx][M = xxx]  
[EXTM = xxxx[,xxx]][DEXTM] <Enter>
```

The basic SUPERSPL command options for a serial printer follow:

```
SUPERSPL LPTn: = COMn:[?][RATE = xxxx[,parity[,databits[,stopbits]]]  
[U = xxx][M = xxx][EXTM = xxxx[,xxx]][DEXTM]  
[ON = option][OFF = option] <Enter>
```

The parameters shown surrounded by brackets ( [ ] ) are optional and can be entered in any order. Each option shown in brackets begins with a slash (/); do not use commas or spaces to separate options. You should enter a command by typing on one line which may wrap around to a second line. (Options are shown on several lines here to indicate option groupings.)

The basic SUPERSPL command options shown above allow you to modify the output port, allocate memory, and configure a serial printer for use with SuperSpool. A description of each option follows.

---

### 5.1.1 Help Option

This option can be used with the SUPERSPL command to display the valid options that can be used as part of the command line. It is used by itself to gather information; it does *not* operate SuperSpool.

Use the following SUPERSPL command for a parallel or serial printer:

**SUPERSPL /? <Enter>**

### 5.1.2 Redirect Output Options

The PC 6300/PC 6300 PLUS normally sends all printer output to LPT1 unless you redirect the output to a different port. When either a serial or parallel port is assigned for printer output with SuperSpool, that port cannot be used by any other program for any purpose until you use another SuperSpool redirection command such as COMn to “release” the port.

For a parallel printer:

**LPTn:**

Selects one of the three possible parallel ports: LPT1, LPT2, or LPT3. Note that your version of MS-DOS may not allow normal parallel output to any port other than LPT1.

For a serial printer:

**LPTn = COMn:**

Redirects parallel printer output to a serial port. COM1 and COM2 are the only valid serial ports. LPTn now responds as LPTn + 1 (LPT1 becomes LPT2, and so forth). This SuperSpool command replaces the MS-DOS MODE command for redirecting output from the parallel port LPT1 to serial port COM1 or COM2. (You must still use the MODE LPT1: command at the start of every computing session before any SUPERSPL command is issued.)

### 5.1.3 Memory Allocation Options

#### **[/U = xxx]**

This option prevents SuperSpool from using *all* memory for a print buffer by reserving a minimum of xxx kilobytes (KB) of memory for the applications program and its work space. If you do not use the /U = xxx option, SuperSpool reserves a minimum default applications program space of 64 KB. SuperSpool will not interfere with this memory.

If you use the /U = xxx option with the SUPERSPL command to reserve space for an applications program other than a SuperPak utility, use the exact same parameter in your SUPERDRV and RAMDISK commands. This parameter is a total and not incremented with each additional command.

If sometimes you use the /U = xxx option to reserve space for another SuperPak utility, the allocation in different utility commands will be for different amounts.

#### **[/M [= xxx]]**

This option allocates xxx KB of memory to SuperSpool for use as a print buffer. If you do not use the /M = xxx option, the buffer size defaults to 64 KB. Using spool buffers of less than 4 KB is not recommended for efficient operation.

If this option is specified without a numeric parameter (/M), *all* remaining available memory that has not been reserved for applications program space (/U), SuperDrive(s), or for MS-DOS itself will be allocated to the spool buffer. This is a powerful option because it allows for absolutely no wasted memory space after making the other necessary memory allocations.

---

A SUPERSPL command using the */M* option probably will not leave enough memory for other driver-type programs to load successfully. Therefore, the other drivers should be loaded before SuperDrive and SuperSpool, or space can be reserved using the */U = xxx* parameter.

***[/EXTM[ = xxxx[,xxxx]]]***

This option is available only when your computer has an AT&T Enhanced Memory Expansion board and its software installed. This software includes the AT&T Expanded Memory Manager (AEMM) and AT&T Extended Memory Emulator (AEX). (Refer to Section 3.5 for further information on using SuperPak with the AT&T Enhanced Memory Expansion board.)

This option enables use of available memory at or above 1 MB by SuperSpool. Memory in the first MB can also be used if necessary. Usually, */EXTM* is specified without any numeric fields, allowing SuperSpool to use any available memory at or above 1 megabyte (MB). The amount of memory actually used by SuperSpool is determined by the */M = xxx* option or the default of 64 KB.

Once you have used a form of the */EXTM* option with a RAMDISK, SuperDrive, or SuperSpool command, then that same option is automatically applied to any following SuperDrive, SuperSpool, or RAMDISK commands — UNLESS one of those commands temporarily disables use of the */EXTM* option with the */DEXTM* option.

To avoid possible conflicts with some applications programs, two numeric fields are provided to allow you to restrict the amount and range of expanded memory that SuperSpool can use. *The first field (four xs) represents the number of 1-KB blocks at or above 1 MB of memory that SuperSpool can use.* If you want to specify an offset

without restricting the amount of memory to be used, specify a 0 in this field (0 indicates no limit, the default).

*The second field (four xs) indicates a starting offset for the portion of memory above 1 MB that SuperSpool can use. The default value is 1024 (1 MB). Any offset specified should be at least 1024 since this is where memory above 1 MB begins.*

An offset can be specified to keep SuperDrive from conflicting with other software using memory above 1 MB, such as IBM's VDISK. No such conflict occurs between SuperDrive and SuperSpool or between SuperSpool and RAMDISK.

If VDISK is operating in extended memory, then you should always place the memory used by SuperDrive after VDISK. For example, if VDISK is operating in the first 800 KB of memory over 1 MB (address 1024 to 1824 KB), and all of the remaining memory is to be available for use by VDISK, SuperDrive, and SuperSpool, then the parameter specified should be `/EXTM=0,1824` (because  $1024 + 800 = 1824$ ).

**[/DEXTM]**

Once the `/EXTM` option has been invoked in a previous command, this option can be used to disable use of extended memory (only in the command(s) it appears in.)

---

## 5.1.4 Serial Printer Configuration Options

When using SuperSpool with a serial printer, these SuperSpool options replace the equivalent MODE command for baud rate, parity, databits, and stopbits:

***[/RATE = xxxx]***

This option sets the baud rate of the selected serial communications adapter (110, 150, 300, 600, 1200, 2400, 4800, or 9600). There is no default for this parameter, except what has been previously set for the printer, for instance by the MS-DOS MODE command.

***[,parity]***

Parity is either N (None), O (Odd), or E (Even). The Default is even.

***[,databits]***

Either 7 or 8. Default is 7.

***[,stopbits]***

Either 1 or 2. If /RATE = 110, the default is 2; otherwise, the default is 1.

***[/ON = option, . . .] [/OFF = option, . . .]***

This option is used to turn on and off certain serial printer port line protocol options. Output to a serial printer occurs only when all SuperSpool printer output conditions have been met. This applies to XON/XOFF, DCD, DSR, and CTS.

Data set line conditions are determined by the state of the signals DCD, DSR, and CTS. You can make SuperSpool ignore all data set line conditions with this command:

***/OFF = DCD,DSR,CTS,XON***

You can enable any or all of these lines with a similar “/ON = option(s)” command. Whether you use the /ON and /OFF options depends on the internal configuration of your serial printer and its cabling to the PC. XON/XOFF is enabled by “/ON = XON” and disabled by “/OFF = XOFF”.

The default condition of the data set line conditions is CTS and DSR ON. That is, SuperSpool must see them ON before it will output data to the printer. DCD and XON/XOFF are OFF (ignored).

Consult your printer manual for information on its particular requirements in all the above serial options. Also check the product user’s manual for further information.

## 5.2 Basic SuperSpool Examples

The following examples illustrate how to use the basic forms of the SUPERSPL command.

### 5.2.1 Parallel Printer Examples

#### *Example 1*

The following command spools printer output to LPT1. It reserves a minimum of 192 KB for the applications program in the first MB of memory. It also enables memory above 1824 KB for the spool buffer, as indicated by the /EXTM option. The /M option indicates that all remaining available memory will be used by SuperSpool.

```
SUPERSPL LPT1:/U = 192/M/EXTM = 0,1824 <Enter>
```

#### *Example 2*

In the following example, the first command uses 100 KB of memory above 1 MB to create a SuperDrive B that is double-sided but not a full 360 KB.



---

The second command spools printer output to LPT1. It enables memory above 1 MB for allocation to SuperDrive and SuperSpool. Since no allocation of memory to SuperSpool or an applications program is made, it reserves by default 64 KB for an applications program and 64 KB for the spool buffer.

```
SUPERDRV B:/EXTM/M = 100 <Enter>  
SUPERSPL LPT1: <Enter>
```

### 5.2.2 Serial Printer Examples

In each of the following serial printer examples, the LPTn port being redirected to COMn becomes LPTn + 1 after activating SuperSpool. (For example, LPT1 responds as LPT2 and LPT2 becomes LPT3.) The SuperSpool redirection command replaces the equivalent MS-DOS MODE commands for serial printers.

#### *Example 1*

The following command spools printer output to serial port COM2 (redirected from LPT1) at 110 Baud, even parity, 7 databits, 2 stopbits. It reserves a minimum of 128 KB for the applications program. It also reserves 16 KB for use as the spool buffer.

```
SUPERSPL LPT1: = COM2:/RATE = 110,E,7,2/U = 128/M = 16 <Enter>
```

#### *Example 2*

The following command spools printer output to serial port COM1 (redirected from LPT1) at 300 Baud, no parity, 8 databits, 1 stopbit. It monitors the XON code from the printer to determine when data can be sent to it, and ignores the DCD, DSR, and CTS lines. It reserves a minimum of 320 KB for the applications program. It also uses all remaining available memory for the spool buffer.

```
SUPERSPL LPT1: = COM1:/RATE = 300,N,8,1/ON = XON/OFF = DCD,DSR,CTS  
/U = 320/M <Enter>
```

### 5.3 Advanced SUPERSPL Command Options

The entire SUPERSPL commands for a parallel printer and for a serial printer, are shown here. The advanced options are highlighted in color and shown in the order in which they are described in this section. The entire SUPERSPL command when output is to a parallel printer port (LPTn) is as follows:

```
SUPERSPL LPTn: [/?][/U = xxx][/M[ = xxx]][/EXTM[ = xxx[, xxx]]][/DEXTM]
[TSIZE = xxxxx][/DH][/DL][/DNC][/DBI][/DMMGMT][/LPP = xx]
[/FF][/STRING = xxx[, xxx, ... ]][/S][/C][/P]
[/B][/R][/RP][/PINT[ = x]] < Enter >
```

When output is to a serial printer with a serial port (COMn), the complete SUPERSPL command is as follows:

```
SUPERSPL LPTn: = COMn:[/?][/RATE = xxx[, parity[, databits[, stopbits]]]]
[/U = xxx][/M = xxx][/EXTM[ = xxx[, xxx]]][/DEXTM]
[/ON = option][/OFF = option]
[TSIZE = xxxxx][/DH][/DL][/DNC][/DBI][/DMMGMT][/LPP = xx]
[/FF][/STRING = xxx[, xxx, ... ]][/S][/C][/P]
[/B][/R][/RP][/SINT[ = x]] < Enter >
```

You can use the advanced SUPERSPL command options to accomplish the following tasks:

- Disable the use of low-, high-, and noncontiguous memory.
- Disable MS-DOS memory management.
- Disable the block transfer interface.
- Set the number of lines per page.
- Perform selected actions while printing.
- Change the IRQ number for a printer.

---

### 5.3.1 Advanced Memory Management Options

#### *[/TSIZE = xxxxx]*

This option is used only when part of the SuperSpool is in memory at or above 1 MB (when the /EXTM option has been used). The TSIZE option sets the maximum number of bytes of data that can be transferred in and out of memory above 1 MB at a time. You can supply any value from 16 bytes to 32,000 bytes (32 KB) with this parameter. The default value for transfer size is 2048 bytes.

The number of bytes you supply with this parameter is rounded down to the nearest multiple of 16 by SuperSpool to yield the actual transfer size, so it is advisable to supply a multiple of 16.

This option may affect interrupt handling since interrupt handling may be suspended while data transfers take place. If interrupts are being lost, then TSIZE should be decreased.

The following options are for users who have their motherboard switches set for less memory than what is actually installed in the computer, or for users who have noncontiguous memory at hexadecimal address :C0000 or higher.

#### *[/DH]*

This option (Disable High-Memory Use) prevents SuperDrive and SuperSpool from using any portion of user memory; that is, contiguous memory which might be available above the limit set by the motherboard switches. It does not, however, prevent them from using any noncontiguous memory which may be present beginning at hexadecimal address :C0000 and up, or from using memory available below the switch settings. It has no effect if there is no contiguous memory available above the switch settings.

***[/DL]***

This option (Disable Low-Memory Use) prevents SuperDrive and SuperSpool from using any portion of contiguous memory below the limit set by the motherboard switches. It restricts them to memory available above the switch settings. If noncontiguous memory is available beginning at hexadecimal address :C0000, it is used first. This implies that there must be memory available above the switch settings in order to use this option.

***[/DNC]***

This option (Disable Noncontiguous Memory Use) prevents SuperDrive and SuperSpool from using any noncontiguous memory which may be available beginning at hexadecimal address :C0000. If contiguous memory is available above the limit set by the switch settings, it is used first.

***[/DMMGMT]***

This option (Disable Memory Management) disables calls to MS-DOS memory management. Normally the SuperDrive and SuperSpool programs will call MS-DOS memory management in an attempt to acquire any additional, unused memory. Using */DMMGMT* prevents those programs from acquiring additional memory from MS-DOS.

You should use this option to ensure that SuperDrive or SuperSpool do not use any unallocated memory that you may want to subsequently allocate to other programs. MS-DOS memory management does not allocate high or noncontiguous memory.

---

### 5.3.2 Disabling the Block Transfer Interface

*[/DBI]*

This option (Disable Block Transfer Interface) disables the block transfer interface that allows easier interface between SuperSpool and other applications software. You can disable this interface to avoid a conflict if your applications software uses interrupt vector INT 58 hexadecimal.

### 5.3.3 Printer Format Option

*[/LPP = xx]*

This option sets the number of lines per page. The default is 66. Please note that SuperSpool does not automatically page your documents for you. The LPP option is used in conjunction with formfeed characters sent to the printer by your software to control paging.

### 5.3.4 Printer Control Options

You can invoke the following Printer Control options from MS-DOS while spooling is taking place to control the printer and the spool buffer output. They can be used to query the spool status and stop the printout among other functions. If your printer has its own internal input buffer, some of the commands may take some time to take effect as the printer empties its own internal buffer.

*[/FF]*

This option sends a formfeed character to the printer.

*[/STRING = xxx[,xxx, ... ]]*

This option sends a series of characters to the printer, which will be translated by the printer according to its character translation code, and then printed. This option

may be used to send a printer initialization character string to the printer. Up to 60 decimal numbers, separated by commas, can be entered. These numbers are converted to characters for transmission to the printer.

**[/S]**

This option stops output of print data. No data will be lost, and you can restart data transmission at any time by using the SUPERSPL/C command.

**[/C]**

This option continues output of print data, if previously stopped by the SUPERSPL/S command.

**[/P]**

This option immediately purges (empties) all data from the SuperSpool print buffer.

### 5.3.5 Page Reprint Options

The /B, /R, and /RP options are used in combination to provide the ability to reprint a page after the printer has been stopped with the /S option. The /B option enables the /R and /RP options. Do not combine the /B option with the /R or /RP options in the same line. The /B option is to be used when first initializing your spool buffer. The /R and /RP options are for use only after printing has already begun.

**[/B]**

This option enables the /RP and /R options (which are explained below). It is recommended that you specify the /B option only when the spool buffer is at least 16 KB in size. Additional buffer space is used to “save” the extra page or two of print data and, in smaller buffer configurations, could consume all available spool buffer space.

---

*[/R]*

This option causes the printer output to be restarted at the beginning of the current page, if enabled by a SUPERSPL/B command.

*[/RP]*

This option causes the printer output to be restarted at the beginning of the previous page, if enabled by the SUPERSPL/B command.

#### NOTE

The /B option is designed for use with text that contains the formfeed and linefeed characters at the appropriate intervals, and does not operate correctly if the formfeed and linefeed characters are not output to the printer.

If the /B option has been previously selected, SuperSpool will monitor the printer output data stream for formfeed (go to the top of the next page) and linefeed (go to the next line) characters. A formfeed character determines the top of page, while a linefeed character specifies the end of a line and can also be used, by counting the number of linefeeds per page, to determine the top of page.

The /R or /RP options tell SuperSpool to immediately continue output at the beginning of the specified page. You can use these options to restart your output at a convenient reference point (the top of the current or previous page) should the printer jam or otherwise malfunction. The purpose of these options is *not* to print multiple copies of the same document. You cannot use the /R and /RP options unless at least one page has been printed.

It is recommended that you use the /R and /RP options in this sequence:

1. From MS-DOS, enter this command to stop printer output:

**SUPERSPL /S**

2. Adjust the printer paper to place the paper at the top-of-form position, and so forth. If the printer has a control to set the top-of-form ("TOF Set" or equivalent), use it.
3. Enter the following command to restart printing at the current or previous page, respectively.

**SUPERSPL /R or SUPERSPL /RP**

### 5.3.6 Changing the IRQ Number for a Parallel Printer

In addition to the MODE command, the following options affect the configuration of SuperSpool when it is used with a parallel printer.

**[/PINT[ = x]]**

This option sets the interrupt request (IRQ) number, which determines the intervals at which data is transferred from the SuperSpool buffer to the printer.

Without this option, data is transferred from the timer interrupt level (IRQ 0), at a uniform interval. However, when /PINT is specified, data transfer is driven by an interrupt signal sent by hardware and is designed for the most efficient use of the printer, rather than at a uniform interval.



---

If `/PINT` is specified without a number, the default IRQ number is used. By default, IRQ 7 is used for LPT1 and IRQ5 is used for LPT2 (in the PC 6300 PLUS).

The variable “x” can be any number from 0 to 7, but values other than 7 and 5 are only used with specially designed printer hardware.

Early parallel ports were not able to properly support this function. If this option does not provide sustained character output, it should be removed from the command line.

### 5.3.7 Changing the IRQ Number for a Serial Printer

`[/SINT = X]`

This option sets the Interrupt Request (IRQ) number, which determines the intervals at which data is transferred from the SuperSpool buffer to the printer.

Without this option, the default IRQ is used. Generally, COM1 is assigned to IRQ4 and COM2 is assigned to IRQ3. The variable X can be any number from 0 to 7, but IRQ values other than 4 and 3 are only used with specially designed printer hardware.

## 5.4 Advanced SuperSpool Examples

The following examples show how the advanced options are used with parallel printers, serial printers. Examples of commands using the printer control and page reprint options, which can be used identically with either type of printer, are also provided.

### 5.4.1 Advanced Parallel Printer Examples

#### *Example 1*

The following command spools printer output to LPT1 using the default IRQ value as indicated by the /PINT option. Because the /U = xxx option was not used, it reserves by default a minimum of 64 KB for the applications program. Because the /M or /M = xxx options were not used, reserves by default 64 KB for use as the spool buffer.

**SUPERSPL LPT1:/PINT <Enter>**

The following command spools printer output to LPT1. Because the /U = xxx option was not used, reserves by default a minimum of 64 KB for the applications program. Reserves 16 KB for use as the spool buffer. Sets the number of lines per page to 60. Enables subsequent use of the /R and /RP commands. Disables memory management calls.

**SUPERSPL LPT1:/M = 16/LPP = 60/B/DMMGMT <Enter>**

### 5.4.2 Advanced Serial Printer Examples

#### *Example 1*

The following command spools printer output to serial port COM1 (redirected from LPT1) at 1200 Baud, no parity, 8 databits, and 1 stopbit. Because the /U = xxx option was not used, reserves by default a minimum of 64 KB for the applications program.

The /EXTM parameter enables 200 KB of memory above 1 MB for use in a spool buffer. The /M option allocates 400 KB of total memory to the spool buffer, so 200 KB will be taken from above 1 MB, and 200 KB will be taken from the first MB of memory. The /B option enables subsequent use of the /R and /RP commands. Disables block transfer interface (you

---

should use the /DBI option to avoid a conflict if your applications software used interrupt vector INT 58 hexadecimal).

```
SUPERSPL LPT1: = COM1:/RATE = 1200,N,8,1/B/DBI  
/EXTM = 200/M = 400 <Enter >
```

### *Example 2*

The following command spools printer output to serial port COM1 (redirected from LPT1) at 2400 Baud, even parity, 7 databits, and 1 stopbit. It monitors the CTS input from the printer to determine when data can be sent to it, and ignores the DCD and DSR inputs. Because the /U = xxx option was not used, reserves by default a minimum of 64 KB for the applications program. Reserves 100 KB for use as the spool buffer. The /B option enables subsequent use of the /R and /RP commands. Disables all memory management calls.

```
SUPERSPL LPT1: = COM1:/RATE = 2400,E,7,1/ON = CTS/OFF = DCD,DSR  
/M = 100/B/DMMGMT <Enter >
```

## 5.4.3 Printer Control and Page Reprint Examples

Some of these examples apply only to serial ports (as indicated), but most can be used for a parallel or serial printer.

### *Example 1*

The following command redirects LPT1 to serial port COM2 using all previously defined SuperSpool options and the previously defined parameters for COM1. The spool buffer must be empty when redirecting ports. It also uses the /B option to enable page reprint functions.

```
SUPERSPL LPT1: = COM2:/B <Enter >
```

*Example 2*

The following command can be used while printing; it stops the printing, and sets lines per page equal to 66.

**SUPERSPL /LPP = 66/S <Enter>**

*Example 3*

The following command restarts printing beginning at the previous page. (this assumes that the /B option has been used in a previous command to enable page reprinting.)

**SUPERSPL /RP <Enter>**

*Example 4*

The following command terminates redirection to the serial port, and directs the spooler output to parallel printer LPT1. The spool buffer must be empty when redirecting ports. LPT2 reverts back to being LPT1, and so forth.

**SUPERSPL LPT1: <Enter>**  
(after prior redirection to serial port)

*Example 5*

The following command enables the /R and /RP print options.

**SUPERSPL /B <Enter>**

*Example 6*

The following command is used while printing to display SuperSpool status after sending a formfeed character to the printer.

**SUPERSPL /FF <Enter>**

---

### *Example 7*

The following command sends a carriage return character followed by a linefeed to the printer.

```
SUPERSPL /STRING = 13,10 <Enter >
```

## **5.5 SuperSpool Application Notes**

The following sections discuss how to best handle particular tasks when using SuperSpool, such as checking on the SuperSpool status, and changing the printer configuration.

### **5.5.1 Determining SuperSpool Status**

Once you have activated SuperSpool, you can check its status at any time by entering the appropriate SUPERSPL command. The current printer configuration and spool buffer status (number of bytes remaining to be printed) will be displayed for reference at the completion of any SUPERSPL command. While spooling is taking place, simply enter "SUPERSPL" from MS-DOS to check its status.

### **5.5.2 Changing Printer Configuration**

You can change the SuperSpool-directed printer port configuration when the spool buffer is empty. However, you can only modify the memory and buffer configuration options (/M, /M = xxx, or /U = xxx) after rebooting the computer.

### **5.5.3 SuperSpool Compatibility**

The SuperSpool program is designed to be transparent to data files. The output of data files is done via the LPTn parallel ports or the COMn serial ports (after invoking the SuperSpool Redirect Output option).

If you use word processing programs that have custom printer selections, you can use only their parallel printer option if you want to use SuperSpool for output. Most word processing programs have special serial port driver routines which may not be compatible with the SuperSpool program. This may also be true of any other applications software which allows you to customize its serial printer output parameters. THIS INCOMPATIBILITY IS NOT CAUSED BY A PROBLEM WITH SUPERSPOOL!

The SuperSpool software was designed to determine its own output parameters and is not meant to contend for output resources with another program. Consult with the supplier of your other software for advice on how to disable its custom serial port driver routines.

Certain programs, especially word processors, will not instantaneously send a large document out to a printer. These programs modify the print data "on the fly", which takes time. They will probably run faster with SuperSpool than without it, but not as fast as, for example, LLISTing a BASIC program through SuperSpool.

Once the SuperSpool program has started, you can output data or files using MS-DOS COPY commands or BASIC and BASICA PRINT commands via the parallel port. The Print Screen command will also work.

Always use the SuperSpool Redirect Output option if you want to spool to a COMn serial port. Do not use the MS-DOS MODE command as a shortcut to redirect printer output; doing so will short circuit the SuperSpool software.

---

### 5.5.4 SuperSpool Utility Batch Files

You can invoke the SuperSpool program from an AUTOEXEC.BAT file just like SuperDrive. The only real restriction is that the SUPERSPL command must immediately follow those for SuperDrive, and a "MODE LPT1:" command should be invoked before everything else (necessary only once per session). Refer to the "Batch Processing" section of your *MS-DOS by Microsoft User's Guide* for more detailed information on batch files.

You may want to add one or more batch files to your MS-DOS boot diskette to allow you to invoke the Printer Control options or display SuperSpool status automatically when you type in a short command while under MS-DOS. This eliminates the lengthy commands you would have to use otherwise.

The commands in the following example create a batch file that spools print data to a typical AT&T serial printer at 1200 Baud, even parity, 7 databits, 1 stopbit. It monitors the CTS signal, ignores the DCD and DSR signals, sets up a 16-KB print spool buffer, and selects page reprint functions. It also allocates a minimum of 64 KB for an applications program. This example includes the exact keyboard sequences for creating the batch files.

```
COPY CON: ATT.BAT <Enter>
MODE LPT1:
SUPERSPL LPT1: = COM1:/RATE = 1200,E,7,1/ON = CTS/OFF = DCD,DSR/M = 16
/B <Enter>
< F6 > < Enter >
```

Once the above file is on your MS-DOS diskette, all you have to do to initialize SuperSpool for this NEC printer is type in:

```
ATT <Enter>
```

### **5.5.5 Using Buffered Printers**

Certain printers, called “buffered” printers, may run very slowly with SuperSpool if their buffering features are enabled. Disabling the buffer in this type of printer will correct this problem when you are using SuperSpool. See your printer manual for information on disabling its buffering capabilities.



The basic form of the RAMDISK DEVICE command and instructions on adding the command to the CONFIG.SYS file are provided in Section 2.6. This section gives the full set of optional parameters that you can use in each of two command formats for installing RAMDISK. Some example commands and rules for using RAMDISK are also included.

### 6.1 Complete RAMDISK DEVICE Command

The complete form for the RAMDISK DEVICE command is as follows:

```
DEVICE = RAMDISK.DEV [/SSIZE = xxx][/DIR = xxx]
[/M[ = xxx]][/U = xxx][/EXTM[ = xxx[, xxx]]][/DEXTM][/TSIZE = xxx]
[/DL][/DH][/DNC]
```

Each of the parameters shown in brackets is optional and can be entered in any order. The preceding slash (/) is used to separate the options. DO NOT use a comma to separate options. The DEVICE command is entered on one continuous line. Several lines are used above to show option groupings.

#### 6.1.1 Sector and Directory Size Options

*[/SSIZE = xxx]*

This option sets the sector size for RAMDISK in bytes. Allowable sizes are 128, 256, or 512. The default value is 128.

*[/DIR = xxx]*

This option sets the number of root directory entries that the RAMDISK can contain. The default is 64. The value specified may range between 2 and 512.

If the value specified multiplied by the size of the directory entry (32 bytes) does not equal a multiple of the sector size, RAMDISK will automatically round up the number of directory entries until a multiple of the sector size is reached.

If the size of RAMDISK does not allow enough room for the directory size specified, then RAMDISK automatically decreases the directory size by one sector at a time. An error message is issued if there is no room for a 1-sector directory. One of the directory entries is used to hold the volume label for RAMDISK.

### 6.1.2 Memory Allocation Options

#### ***/M[ = xxxx]***

This option specifies the size of the RAMDISK in kilobytes (KB), varying the default allocation of 512 KB. The range of values that you can specify is between 1 and the maximum available memory on your PC.

The actual amount of memory used up for the RAMDISK will be slightly more than the value specified by */M = xxx*.

If */M* is specified without any numeric value, then all remaining available memory is allocated to RAMDISK. If you use this form of the option, then the */U = xxx* parameter should be used to reserve some of the memory for use by other applications, SuperPak, and device driver programs.

#### ***/U = xxx]***

This option specifies the minimum amount of memory in KB to be reserved for use by applications programs or other device drivers. The default value is 64 KB. The value specified by the */U = xxx* option has priority over all other memory allocation.

The value specified by */U = xxx* is only a minimum; there may be more available if you have not allocated all other memory to SuperDrive and/or SuperSpool. After creating your RAMDISKs, you can verify how much user memory is available by using the MS-DOS CHKDSK command.

---

If you use the `/U=xxx` option to reserve space for a program other than another SuperPak utility, you should use the exact same `/U=xxx` parameter in all SuperDrive, SuperSpool, and subsequent RAMDISK commands. (You can specify decreasing amounts of reserved memory in subsequent SuperPak commands if each command is using space reserved by the preceding command.)

`[/EXTM[=xxxx[,xxxx]]]`

This option is available if your computer has the AT&T Enhanced Memory Expansion board and software installed. This software includes the AT&T Expanded Memory Manager (AEMM) and AT&T Extended memory emulator (AEX). (Refer to Section 3.5 for further information on using SuperPak with expanded memory.)

This option enables use of available memory at or above 1 megabyte (MB) by RAMDISK. Memory in the first MB can also be used if necessary. Usually, `/EXTM` is specified without any numeric fields, allowing your RAMDISK to use any available memory at or above 1 MB.

The amount of memory actually used by RAMDISK is determined by the default (512 KB) or the `/M=xxx` option. Once you have used a form of the `/EXTM` option with a RAMDISK, SuperDrive, or SuperSpool command, then that same option is automatically applied to any following SuperDrive, SuperSpool, or RAMDISK commands, UNLESS one of those commands disables use of the `/EXTM` option with the `/DEXTM` option.

To avoid possible conflicts with some applications programs, two numeric fields are provided to allow you to restrict the amount and range of extended memory that RAMDISK can use. *The first field (four xs) represents the number of 1-KB blocks at or above 1 MB of memory that RAMDISK*

can use. If you want to specify an offset without restricting the amount of memory to be used, specify a 0 in this field (0 indicates no limit, the default).

The second field (four xs) indicates a starting offset for the portion of memory above 1 MB that RAMDISK can use. The default value is 1024 (1 MB). Any offset specified should be at least 1024 since this is where memory above 1 MB begins.

An offset can be specified to keep RAMDISK from conflicting with other software using memory above 1 MB, such as IBM's VDISK. No such conflict occurs between RAMDISK and SuperSpool or between RAMDISK and SuperDrive.

If VDISK is operating in extended memory, then you should always place the memory used by RAMDISK after VDISK. For example, if VDISK is operating in the first 800 KB of memory over 1 MB, (address 1024 to 1824 KB), and all of the remaining memory is to be available for use by RAMDISK, SuperDrive, and SuperSpool, then the parameter specified should be /EXTM=0,1824 (since  $1024 + 800 = 1824$ ).

**[/DEXTM]**

This option is only used when more than one RAMDISK is being created. If a form of the [/EXTM] option was used in a previous RAMDISK command, then this option can be used to *disable* use of memory at or above 1 MB for the current RAMDISK that is being created.

**[/TSIZE = xxxxx]**

This option is used only when part of the RAMDISK is in memory at or above 1 MB (when the /EXTM option has been used). The TSIZE option sets the maximum number of bytes of data that can be transferred in and out of

---

memory above 1 MB at a time. You can supply any value from 16 bytes to 32,000 bytes (32 KB) with this parameter. The default value for transfer size is 2048 bytes.

The number of bytes you supply with this parameter is rounded down to the nearest multiple of 16 by RAMDISK to yield the actual transfer size, so it is advisable to supply a multiple of 16.

This option may affect interrupt handling since interrupt handling may be suspended while data transfers take place. If interrupts are being lost, then TSIZE should be decreased.

### 6.1.3 Disabling Memory Regions

The following options are for users who have more memory actually installed in their computer than indicated by their motherboard switch settings (expanded/extended or high memory), or for users who have noncontiguous memory at hexadecimal address :C0000 or higher. Definitions of contiguous and noncontiguous memory are included in Appendix A.

*[/DH]*

This option (Disable High-Memory Use) prevents RAMDISK from using any portion of contiguous memory which might be available above the limit set by the motherboard switches. It does not, however, prevent them from using any noncontiguous memory which may be present beginning at hexadecimal address :C0000, or from using memory available below the switch settings. It has no effect if there is no contiguous memory available above the switch settings.

**[/DL]**

This option (Disable Low-Memory Use) prevents RAMDISK from using any portion of user memory for data storage; contiguous memory below the limit set by the motherboard switches. It restricts them to using only the memory available above the switch settings. If noncontiguous memory is available beginning at hexadecimal address :C0000, it is used first. A portion of user memory will always be used for RAMDISK resident code.

**[/DNC]**

This option (Disable Noncontiguous Memory Use) prevents RAMDISK from using any noncontiguous memory which may be available beginning at hexadecimal address :C0000. If contiguous memory is available above the limit set by the switch settings, it is used first.

## **6.2 Alternative RAMDISK DEVICE Command — VDISK Compatible**

There is a second form of the DEVICE command that can be placed in the CONFIG.SYS file to install RAMDISK. This second form is provided for compatibility with the format for the VDISK DEVICE command provided in the *IBM DOS Manual* (version 3.10). It provides a subset of the options in the other command given earlier in this section, but uses a slightly different format.

In the following VDISK-type command format, the first line of options must be entered in the order shown. The second line of options can be entered in any order, as long as they follow all of the first-line options.

---

The VDISK-type format that is acceptable for the RAMDISK DEVICE command is as follows:

```
DEVICE = RAMDISK.DEV [aaa[ bbb[ ccc]]][/E[:d]]  
[/DEXTM][/U = xxx][/DH][/DL][/DNC]
```

where:

*[aaa]* specifies the amount of memory (in units of KB) to allocate to RAMDISK. *aaa* corresponds to the *xxx* in the memory allocation option */M = xxx* (Section 6.1.2).

*[bbb]* specifies the sector size (in bytes) for RAMDISK. *bbb* corresponds to the *xxx* in the sector size option */SSIZE = xxx* (described in Section 6.1.1).

*[ccc]* specifies the number of directory entries for RAMDISK. The variable *ccc* corresponds to the *xxx* in the */DIR = xxx* option (described in Section 6.1.1).

*[/E]* enables use of memory at or above 1 MB. The */E* option corresponds to the */EXTM* form of the */EXTM[ = xxx][,xxx]* option, (described in Section 6.1.2).

*[:d]* specifies transfer size for memory at or above 1 MB. *:d* corresponds to the */TSIZE = xxx* option (Section 6.1.2), except that the */TSIZE* option specifies transfer size in bytes while the *d* option specifies transfer size in sectors.

*[/DEXTM]* is only used when more than one RAMDISK is being created. If a form of the *[/EXTM]* option was used in a previous RAMDISK command, then this option can be used to *disable* use of memory at or above 1 MB for the current RAMDISK that is being created.

*[/U = xxx]* specifies the minimum memory to be reserved for use by applications programs. This option is described fully in Section 6.1.2.

*[/DL]* disables use of conventional memory below motherboard switch settings, except for what is needed for use by resident code. This option is fully described in Section 6.1.3.

*[/DH]* disables use of conventional memory above motherboard switch settings, except for what is needed for use by resident code. This option is fully described in Section 6.1.3.

*[/DNC]* disables use of noncontiguous memory. This option is fully described in Section 6.1.3.

### 6.3 Rules for Using RAMDISK

- Before using the */EXTM* option, AEMM and AEX must be installed.
- The RAMDISK DEVICE command must follow the AEMM and AEX commands in the CONFIG.SYS file.
- Because RAMDISK is installed from the CONFIG.SYS file instead of an AUTOEXEC file or MS-DOS command, RAMDISK is always installed before SuperDrive and SuperSpool. The use or nonuse of the */EXTM* option by RAMDISK is automatically applied to the other two utilities if they are in use, or to subsequent usage of RAMDISK, (unless it is disabled by the */DEXTM* option).
- The RAMDISK DEVICE command has two different acceptable formats, the basic format and the VDISK-type format. Both are described in this section.
- If memory at or above 1 MB is present, there is no noncontiguous memory, and the *[/DNC]* option is not used.



---

## 6.4 RAMDISK DEVICE Command Examples

In the following examples, it is assumed that expanded memory at or above 1 MB is present, along with the AEMM and AEX software.

### *Example 1*

In this example, two RAMDISKs are created. The two commands shown would be located together in the CONFIG.SYS file. The first command uses the VDISK-type format. It creates a 200-KB RAMDISK which starts in memory at or above 1 MB (indicated by the /E option). The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

The second command uses the basic format. This command creates a 100-KB RAMDISK (using the /M = 100 option). Memory for the RAMDISK will be allocated first from remaining memory above the first RAMDISK created, and then from the 1st MB of memory if necessary. The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

```
DEVICE = RAMDISK.DEV 200 /E  
DEVICE = RAMDISK.DEV /M = 100
```

### *Example 2*

This example also includes two RAMDISK DEVICE commands that could be included in a CONFIG.SYS file, one directly after the other. The first command uses the VDISK-type format. It creates a 50-KB RAMDISK with memory allocated from the first MB. This RAMDISK has 128 directory entries (indicated by the /DIR = 128 option), and the default values for sector size (128 bytes).

The second command is shown in the basic format. It creates a 512-KB (default size) RAMDISK. Available memory at or above 1 MB will be allocated before memory in the first MB (indicated by the */EXTM* option). The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

**DEVICE = RAMDISK.DEV 50/DIR = 128**  
**DEVICE = RAMDISK.DEV /EXTM**

*Example 3*

The following command creates a RAMDISK that occupies as much memory as is available in the computer (indicated by the */M* option), except for 512 KB that is reserved for other device drivers and applications programs (by the */U = 512* option). The RAMDISK memory is allocated starting at or above 1 MB (indicated by the */EXTM* option), and then from the first MB as well. The RAMDISK created has 128 directory entries in the root directory, indicated by the */DIR = 128* option. The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

**DEVICE = RAMDISK.DEV /M/EXTM/DIR = 128/U = 512**

*Example 4*

The following command uses the memory management options to allocate all available memory at or above 1 MB to a RAMDISK. The */M* option indicates to use all available memory. The */EXTM* option indicates to use memory at or above 1 MB first. The */DL* and */DH* options disable use of any memory below 1 MB. The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

**DEVICE = RAMDISK.DEV /M/EXTM/DL/DH**

Refer to your *MS-DOS by Microsoft User's Guide* for an explanation of terms or concepts related to MS-DOS functions (AUTOEXEC.BAT files, batch files, MS-DOS commands, default drive, and so forth).

### **Applications program**

The program the user is going to run after setting up SuperDrive and/or SuperSpool. This could be a word processor, general ledger, or any other software. To prevent SuperDrive and SuperSpool from disturbing the applications program, use the /U=xxx option to reserve an area of memory for it.

### **Buffer portion**

The data storage area of memory used by either SuperDrive or SuperSpool, as opposed to the resident (program) portion. The size of this area of memory is controlled by the /M or /M=xxx option.

### **Contiguous memory**

Memory in the 640-KB range from hexadecimal address 00000 to 9FFFF, with no gaps. Memory below the limit set by the motherboard switches is called "low memory". Memory above the limit set by the switches is called "high memory". The PC 6300 PLUS has only contiguous, low memory.

### **Device Driver Program**

A program that allows extra hardware devices, such as disk drives or add-on boards, to be linked into MS-DOS.

### **Expanded memory**

Memory above 640 KB that is accessed by expanded memory manager software such as the device driver programs AT&T Expanded Memory Manager (AEMM) and the AT&T Extended Memory Emulator (AEX).

**Extended memory**

Memory at or above 1 megabyte (MB).

**Kilobyte**

A unit of measure for memory. KB is an abbreviation for kilobyte. One KB is equal to 1024 bytes of memory.

**Logical disk drive**

An electronic disk drive being simulated in memory space by SuperDrive software.

**Megabyte**

A unit of measure for memory. MB is an abbreviation for megabyte. One MB is equal to a thousand kilobytes, and approximately a million bytes, of memory.

**Noncontiguous memory**

Memory that begins following a gap in addressing in certain PC configurations. You cannot use noncontiguous memory in a PC with 256 KB of motherboard memory, the PC 6300/PC 6300 PLUS or a PC with 64 KB of motherboard memory that has the new Read Only Memory Basic Input/Output System (ROM BIOS) installed.

**Physical disk drive**

A mechanical floppy disk drive (not a SuperDrive).

**Resident portion**

The program portion of either SuperDrive or SuperSpool, as opposed to the portion used for storing data (the buffer portion). Also refers to the program portion of the MS-DOS MODE command used by SuperSpool.

**User area**

The area of memory set aside for the applications program by SuperDrive and SuperSpool via the /U=xxx option. SuperDrive and SuperSpool will not disturb this area of memory. This area will never be less than 64 KB in size.

# CREATING AUTOEXEC.BAT AND CONFIG.SYS FILES

---

General instructions follow on how to create an AUTOEXEC.BAT or CONFIG.SYS file, or modify an existing file. More detailed information about how to tailor your AUTOEXEC.BAT file to install SuperDrive and SuperSpool is given in Sections 4 and 5. More information about installing RAMDISK in your CONFIG.SYS file is included in Section 6.

### B.1 Creating an AUTOEXEC File

To create an AUTOEXEC.BAT file, start by entering the following command:

```
A>COPY CON: AUTOEXEC.BAT <Enter>
```

This COPY command allows you to copy the information you will enter from your standard input device (such as a keyboard) into an AUTOEXEC.BAT file located on the diskette in your default drive. After you enter the COPY command shown above, the cursor will drop down a line. You should then type in each command to be included in your AUTOEXEC file on a separate line, and end each line by pressing the <Enter> key. When the file is completed, press the <F6> function key, then the <Enter> key to end copying to the file.

In the following example AUTOEXEC.BAT file, SuperDrive and SuperSpool are run with default parameters.

```
SUPERDRV C:  
SUPERSPL LPT1:
```

## B.2 Modifying an AUTOEXEC File

If you already have an AUTOEXEC file on your boot diskette, and you wish to add to it commands for some of the SuperPak utilities, do the following:

### STEP 1

*Determine what is currently in your AUTOEXEC file:* at the DOS A> prompt, insert the boot diskette to be modified in drive A: and enter the following:

```
A>TYPE AUTOEXEC.BAT <Enter>
```

### STEP 2

*Enter the following MS-DOS COPY command:*

```
A>COPY CON AUTOEXEC.BAT <Enter>
```

The cursor will drop down one line.

### STEP 3

*Modify your current AUTOEXEC.BAT file:* type in the contents of the AUTOEXEC.BAT file as it is listed on your screen, except add the SuperDrive and/or SuperSpool commands to the file in the appropriate location. (For example, if one of the commands in your AUTOEXEC file copies files to the SuperDrive, then your SuperDrive command must precede the COPY command.) Press the <Enter> key at the end of each line.

### STEP 4

*Check the file carefully:* ensure that all commands have been properly entered. After you have done this, press the following key sequence to close the file:

```
A> <F6> <Enter>
```

### **B.3 Creating or Modifying a CONFIG.SYS File**

A text editor such as EDLIN can be used to modify an existing CONFIG.SYS file on your working boot diskette.

The instructions for creating a CONFIG.SYS file are identical to those for creating an AUTOEXEC file, except that the COPY command would be as follows:

```
A>COPY CON: CONFIG.SYS <Enter>
```

The CONFIG.SYS file must reside on your boot diskette.

---

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# SUPERDRIVE, SUPERSPOOL, AND RAMDISK: RULES FOR USING THEM TOGETHER

---

Following are a few rules that are useful to keep in mind, especially when you are using several SuperPak utilities together.

- If the `/U=xxx` option is used to reserve space for applications programs, the identical `/U=xxx` option should be used with all programs. However, if one utility uses the option to reserve space for other SuperPak utilities, later utility commands will reserve a smaller amount of memory than the first command.
- RAMDISK is *a/ways* installed before SuperDrive and SuperSpool because it is installed through the CONFIG.SYS file, as your PC is started up (before the AUTOEXEC file). When using both SuperDrive and SuperSpool, the SuperDrive commands must immediately precede the SuperSpool commands. Both programs should be initialized before you run your applications software.
- If you want to reconfigure the `/U=xxx`, `/M`, `/M=xxx`, or `/EXTM` options for RAMDISK, SuperDrive or SuperSpool, you must reboot the computer and start from scratch.
- For RAMDISK, SuperDrive and SuperSpool to all use memory above 1 megabyte (MB), you only need to specify the `/EXTM` option in the first RAMDISK (or other first) command. The option is automatically applied to all following commands unless it is discontinued by the `/DEXTM` option.

Both SuperSpool and SuperDrive function properly with MS-DOS. There may be programs that will not work properly with a disk emulate or print spooler. For example, when you use SuperSpool with a serial printer and a program (such as a word processor) that has its own serial printer driver routine built in, there may be conflicts between the programs that prevent proper operation.

Another example of incompatible programs are applications programs which expect to be loaded and executed out of a specific memory range. They may not allow themselves to be displaced to a different address by SuperDrive, SuperSpool and RAMDISK.





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