



410239 Rev B

**CP/M 2.2
DOS 3
User's Guide**

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DOS 3
USER'S GUIDE

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1.0 INTRODUCTION

DOS 3 is Dynabyte's single-user operating system. DOS 3 enhances Digital Research's CP/M 2.2 disk operating system and fully implements all of the features of CP/M. In addition, DOS 3 supports the entire Dynabyte product line.

1.1 DOS 3 Features

Dynabyte's DOS 3 enhances CP/M with several unique features and interfaces it completely to all Dynabyte hardware. Clear installation procedures allow you to expand the system using either standard DOS 3 software or user-defined software.

You may install your own sign-on message to appear anytime you boot your system. The DYNASYS program also allows you to easily customize your system. Other features include user-friendly utility programs that eliminate the need to learn the CP/M PIP program.

DOS 3, however, has not altered CP/M in any way. You may use every one of its facilities and features as outlined in the CP/M manuals. DOS 3, rather, has enhanced several areas of the Basic Input/Output System (BIOS) and has added features to provide capabilities beyond those of CP/M. The following paragraphs describe these notable features of Dynabyte DOS 3.

Connect Up To Four I/O Devices

Since DOS 3 is a single-user operating system, it follows that only one person may use it at a time. However, up to four consoles, printers, readers, and punches may be connected and installed in the operating system. DOS 3 utilities switch control between any of the four devices. This feature allows consoles to be placed at up to four user positions. You can then easily transfer control of the Dynabyte computer between any of the consoles.

Also, more than one printer may be connected directly on-line to the system, each with different capabilities (loaded with a different type of paper, character printer or dot matrix, and so forth). You can then decide which printer is appropriate for a given applications program.

Automatic Program Load

You can specify a particular command to be executed each time you turn on or restart the computer. Using this feature can put you directly into an applications program, such as WordStar or Business Manager.

Sign-On Message

You can write your own sign-on message that would appear whenever your computer is first turned on or reset. Your sign-on or "Cold Boot Message" would replace the DYNABYTE DOS 3 message. In this manner, you may have your company logo displayed anytime your system is booted. This feature could also be used

to pass along information, making your Dynabyte computer even more user-friendly.

Modular Design

DOS 3 consists of a series of utility program modules. Each module contains one code required to support one item in the Dynabyte product line. For example, the FPYCPM.COM program module is dedicated to Dynabyte floppy disk drives. Other program modules support CPU input/output (I/O) ports, the Dynabyte octaport circuit board (which provides eight physical I/O ports), and direct-connect, auto-answer modems for computer communications over a telephone line. The DYNASYS program uses these utility programs to configure your system disk such that it contains only those modules needed for your particular system. Furthermore, if you expand your Dynabyte computer, you need only run DYNASYS to configure a new system disk to add the necessary modules. By not loading unnecessary files, this modular concept saves valuable disk and computer memory space.

User-Selected Cold and Warm Boot Drives

The DYNASYS program allows you to determine the default logged disk drive. When you turn on the computer or press the reset button, the computer goes to the default logged drive for the operating system program. In standard CP/M, this drive is always drive A. However, by using DYNASYS, you can cause the computer to automatically select any disk drive for start-up (Cold Boot). In addition, you can cause the computer to automatically select drive A through drive P when you type Control-C at your console (Warm Boot). DOS 3 allows this reload operation to be configured for any logical drive. One distinct advantage of this feature is that your DOS 3 operating system may be placed on your hard disk, thus allowing the computer to rapidly restart when you type Control-C at your console.

Auto-Answer Modem

DOS 3 includes a special module dedicated to the direct-connect, auto-answer modem boards manufactured by Potomac Micro-Magic, Inc. (PMMI) and D.C. Hayes, Inc. These circuit boards, the PMMI MM-103 and the D.C. Hayes Micromodem 100, both install directly into your Dynabyte computer. These Bell 103A-compatible modems operate at a variety of baud rates, stop bits, and word lengths. You may define up to an eight-character password; DOS 3 will not allow another person to use your system through the modem until he correctly enters the password.

1.2 Scope of this Manual

This manual is your guide to using all the features of the DOS 3 Operating System. This manual is written for the user who is new to business micro-computer systems in general. It is also written for the advanced user who is already very familiar with microcomputers, but who may not be well acquainted with DOS 3. The manual is divided into 9 sections and 5 appendices as follows:

1. Introduction
2. Getting Started: Copying and Installing DOS 3
3. System Definition and Configuration
4. The Boot ROM
5. Formatting and Configuring Disks
6. Cartridge Tape Systems
7. Copying Data
8. Consoles, Printers and Modems
9. Advanced Features

- Appendix A. Memory Board Switch Settings
- Appendix B. System Load Map
- Appendix C. USERIO.MAC Listing
- Appendix D. Files on the Distribution Media
- Appendix E. User's Comments Form

The following paragraphs describe the general purpose and content of these sections.

Introduction

This section contains general information about DOS 3, including its features and options. The introduction also describes the manual's overall scope and documentation conventions used.

Getting Started: Copying and Installing DOS 3

The second section contains procedures that are specially written to get you started with your new Dynabyte operating system DOS 3. This section tells you how to copy the DOS 3 distribution media (i.e., floppy disk or cartridge tape) — a task you should always do to protect your masters. The section further explains how to install DOS 3 for the first time on your system.

System Definition and Configuration

The third section provides procedures to define your system and tailor the system to your requirements.

The Boot ROM

This section describes the relationship of Dynabyte's ROM series to the system start-up.

Formatting and Configuring Disks

This section describes how to format and configure the various types of disk drives supported by DOS 3.

Cartridge Tape Systems

The Cartridge Tape section contains instructions for using cartridge tape media. It also contains procedures for transferring files from the Winchester drive to a tape cartridge.

Copying Data

This section details two programs that copy volumes of data from disk drives — BACKUP and HCOPY.

Consoles, Printers And Modems

This section tells you how to install printers and terminals with your Dynabyte computer. These instructions include information for choosing a Dynabyte input/output (I/O) port for the printer and terminal. It also describes the built-in modem capability of DOS 3 and how it may be used with modems which install inside the Dynabyte.

Advanced Features

This last section provides information and instructions for advanced Dynabyte users to program their own user modules. It lists port addresses and entry points for user access to the BIOS.

Appendix A

The first appendix illustrates the correct setting of the switches on the memory board. These switches define such user-alterable operating parameters as addresses.

Appendix B

When first booted, DOS 3 optionally displays an address directory (system load map) that lists the starting memory addresses of Dynabyte program modules. Appendix B describes the function and use of the information displayed by the load map.

Appendix C

Appendix C lists the Dynabyte macro program module User I/O (USERIO.MAC). This listing is provided for advanced system users who wish to define their own I/O drivers.

Appendix D

Appendix D lists and describes each of the files provided on the distribution media.

Appendix E

Dynabyte created the reader comment form at the back of this manual because we want to hear from you. If you have any suggestions for improving this User's Guide, please let us know. When filling out the form, please be as specific as possible.

1.3 Documentation Conventions

The terms used in this manual are consistent with those used in the micro-computer industry. If you are new to microcomputers, we recommend you read Dynabyte's Getting Started Guide. You may also acquire one of the many good texts on basic computer concepts and terms. These texts are widely available at computer and electronic hobbyist stores.

Most conventions used in this manual are also consistent with those used throughout the industry. This manual does, however, use several conventions unique to Dynabyte. The following paragraphs describe these conventions.

Screen Displays

This manual contains many illustrations of console screen displays. These displays are shown in bold type and capital letters.

User Entries

Entries you make at your console keyboard are underlined and are in bold face in these illustrations. For example, a typical screen display with your keyboard entry would appear as

DYNABYTE DOS 3

A>DIR<CR>

Typing the carriage return key is represented as **<CR>**.

<u>METHOD</u>	<u>DESCRIPTION OF COMPUTER SYSTEM</u>	<u>DYNABYTE MODELS</u>
1	Two floppy drives (5.25" or 8") See Section 2.1	5200 5300 5305 5400
2	5.25" Mini Winchester with one floppy drive (5.25" or 8") See Section 2.2	5505 5605
3	8" Fujitsu Winchester with one 8" floppy drive See Section 2.3	5615
4	Winchester hard disk with cartridge tape drive See Section 2.4	5013 5700 5710

2.1 Models 5200, 5305

Two floppy drives (5.25" or 8")
Dynabyte Models 5200, 5300, 5305, 5400

METHOD 1 OVERVIEW

- Boot DOS 3 from Distribution Disk #1.
 - Format two floppy disks.
 - Copy the DOS 3 distribution disks.
 - Reboot DOS 3 from one of the new copies of the distribution disks.
-

Boot DOS 3 from Distribution Disk #1.

1. Turn on the computer.
2. Insert Distribution Disk #1.

Insert distribution disk #1 into the left (or top) floppy drive, drive "A", and close the door. (Insert an 8" floppy disk with its label face up; insert a 5.25" floppy disk so that its label faces the computer power switch.)

3. Press and release the reset button.

DOS 3 will automatically be read into the computer, and will then sign on with the following message:

```
DYNABYTE DOS 3.XX  
A>
```

The "A>" prompt indicates that DOS 3 is "logged" onto logical drive "A", and is ready for additional commands.

At this point, the loading process, also known as "booting", is complete.

Format two floppy disks.

1. Use FFORMAT to format two floppy disks.

A>FFORMAT<CR>

Enter "FFORMAT" followed by a carriage return. FFORMAT will sign on with the following prompt:

DYNABYTE FLOPPY DISK FORMAT UTILITY

VERSION X.X FOR DOS 3.XX

ENTER DRIVE LETTER OF FLOPPY DRIVE (A-P): B<CR>

Enter "B" followed by a carriage return to specify the right-hand floppy drive. Depending on your computer system's drive type, you will then receive one of the following messages:

**DRIVE B IS A SINGLE SIDED 8 INCH DRIVE
 DRIVE B IS A DOUBLE SIDED 8 INCH DRIVE
 DRIVE B IS A SINGLE SIDED 5 1/4 INCH DRIVE
 DRIVE B IS A DOUBLE SIDED 5 1/4 INCH DRIVE
 CANNOT RECOGNIZE DRIVE TYPE
 NO ATTACHED DRIVE**

FFORMAT will then ask what function you would like to perform:

DO YOU WANT TO:

**F - FORMAT
 C - CHECK
 Q - QUIT**

YOUR SELECTION ? F<CR>

Enter "F" followed by a carriage return to indicate FORMAT.

If the drive is double-sided, FFORMAT will then ask whether you want one or both sides formatted:

SIDE FORMAT SELECTION

**1 - FOR SINGLE SIDED
 2 - FOR DOUBLE SIDED
 RETURN - FOR SINGLE SIDED**

SIDE FORMAT ? 1<CR>

Enter "1" followed by a carriage

return to indicate single-sided.

All 5.25" floppy drives are automatically double-density, but if you have an 8" floppy drive, then FFORMAT will prompt for single- or double-density:

DENSITY FORMAT SELECTION

- 1 - FOR SINGLE DENSITY
- 2 - FOR DOUBLE DENSITY
- RETURN - FOR DOUBLE DENSITY

DENSITY FORMAT ? <CR>

Enter a carriage return to indicate double-density.

FFORMAT will now ask you to enter the number of directory entries to reserve space for on the floppy disk:

NUMBER OF DIRECTORY ENTRIES

- 1 - FOR 64 ENTRIES
- 2 - FOR 128 ENTRIES
- 3 - FOR 256 ENTRIES
- RETURN - FOR 64 ENTRIES

OF DIRECTORY ENTRIES ? 2<CR>

Enter "2" followed by a carriage return to reserve space for 128 directory entries.

FFORMAT will then tell you to insert the floppy disk you want to format into the floppy drive:

INSERT DISK. HIT ESCAPE TO ABORT OR ANY OTHER KEY TO BEGIN ...

Insert a floppy disk into the right-hand floppy drive, drive "B", and close the door.

CAUTION: FFORMAT will erase any data that exists on the floppy disk.

Also, be sure the floppy disk is not write-protected. You can write on an 8" floppy disk if the write-protect notch is covered up; you can write on a 5.25" floppy disk if the notch is uncovered.

<CR>

Enter a carriage return to start the actual formatting process. FFORMAT then tells you it is working and asks you to wait:

.... FORMATTING IS NOW BEING DONE PLEASE WAIT

If, during the formatting process, FFORMAT finds a bad sector on the floppy disk and is unable to format it, the error will be reported as follows:

HARD ERROR AT TRACK=XX SECTOR=XX
!!! BAD DISKETTE REPLACE WITH A NEW ONE !!!

A damaged floppy disk should be removed and discarded. Start the format process on another floppy disk.

After the floppy disk has been formatted, FFORMAT will confirm its completion and then ask if you want to format another floppy disk:

***** FORMAT COMPLETED O.K. *****

REPEAT SAME OPERATION ON A NEW DISK (Y/N) ?

Remove the newly formatted floppy disk from floppy drive "B".

Y<CR>

Enter "Y" followed by a carriage return. FFORMAT will then tell you to insert a floppy disk into the drive:

INSERT DISK. HIT ESCAPE TO ABORT OR ANY OTHER KEY TO BEGIN ...

Insert another floppy disk into floppy drive "B", and close the door.

<CR>

Enter a carriage return to start the formatting process. FFORMAT tells you it is working and asks you to wait:

.... FORMATTING IS NOW BEING DONE PLEASE WAIT

Again, if FFORMAT reports a bad sector, the damaged floppy disk should be discarded and the format process tried on another floppy disk.

After the floppy disk has been formatted, FFORMAT will confirm its completion and then ask if you want to format another floppy disk:

***** FORMAT COMPLETED O.K. *****

REPEAT SAME OPERATION ON A NEW DISK (Y/N) ? N<CR>

Enter "N" followed by a carriage return. FFORMAT will then return to its main menu:

DO YOU WANT TO:

F - FORMAT
C - CHECK
Q - QUIT

YOUR SELECTION ? Q<CR>

Enter "Q" followed by a carriage return to exit FFORMAT and return to the operating system.

Leave the newly formatted floppy disk in floppy drive "B".

2. Remove Distribution Disk #1 from floppy drive "A".

Copy the DOS 3 Distribution Disks.

1. Insert Distribution Disk #2 into floppy drive "A", and close the door.
2. Invoke BACKUP.

A>BACKUP<CR>

Enter "BACKUP" followed by a carriage return. BACKUP will then sign on with the following menu and prompt:

***** DYNABYTE BACKUP UTILITY VER. X.X RUNNING UNDER CP/M *****

**F = FILE BY FILE COPY
T = TRACK BY TRACK COPY
X = EXIT TO OPERATING SYSTEM**

WHICH BACKUP MODE ?

3. Remove Distribution Disk #2 from floppy drive "A".
4. Insert Distribution Disk #1 into floppy drive "A", and close the door.
5. Copy Distribution Disk #1.

WHICH BACKUP MODE ? T<CR>

Enter "T" followed by a carriage return to indicate a track-by-track transfer from floppy-to-floppy. BACKUP will then ask you to identify the source drive:

SOURCE DRIVE (A - P) ? A<CR>

Enter "A" followed by a carriage return to specify the left floppy drive as the source drive. BACKUP will then prompt for the destination drive:

DESTINATION DRIVE (A - P) ? B<CR>

Enter "B" followed by a carriage return to specify the right-hand floppy drive as the destination drive.

BACKUP will confirm your instructions for the data transfer, and then instruct you to insert the formatted floppy disk:

SOURCE = X" SS DD FLOPPY DIR ENTRIES = 0128
DESTINATION = X" SS DD FLOPPY DIR ENTRIES = 0128

INTERNAL RAM MEMORY BUFFER SIZE = 42737 BYTES
OF SOURCE DISK TRACKS BUFFERED = 06

INSERT FLOPPY DISK #01 IN DRIVE B

HIT RETURN TO CONTINUE.... <CR>

Enter a carriage return to start the actual data transfer. The screen will display a single line of iterating numbers as BACKUP reads groups of tracks from the source disk and writes groups of tracks onto the formatted destination disk:

BACKUP IN PROGRESS
READING TRACK #00000 WRITING TRACK #00000

When all of the tracks have been copied, BACKUP will report its completion and prompt you to enter a carriage return:

BACKUP COMPLETE

HIT RETURN TO CONTINUE.... <CR>

Enter a carriage return. BACKUP will then return to its main menu:

*** DYNABYTE BACKUP UTILITY VER. X.X RUNNING UNDER CP/M ***

F = FILE BY FILE COPY
T = TRACK BY TRACK COPY
X = EXIT TO OPERATING SYSTEM

WHICH BACKUP MODE ?

6. Remove Distribution Disk #1 from floppy drive "A".
7. Remove the new copy of Distribution Disk #1 from floppy drive "B" and label it "Copy -- DOS 3.XX Distribution Disk #1 of 2".
8. Insert Distribution Disk #2 into floppy drive "A", and close the door.
9. Insert the remaining formatted floppy disk into floppy drive "B", and close the door.

10. Copy Distribution Disk #2.

WHICH BACKUP MODE ? T<CR>

Enter a "T" followed by a carriage return to once again indicate a track-by-track transfer from floppy-to-floppy. BACKUP will then ask you to identify the source drive:

SOURCE DRIVE (A - P) ? A<CR>

Enter "A" followed by a carriage return to specify the left floppy drive as the source drive. BACKUP will then prompt for the destination drive:

DESTINATION DRIVE (A - P) ? B<CR>

Enter "B" followed by a carriage return to specify the right-hand floppy drive as the destination drive.

BACKUP will confirm your instructions for the data transfer, and then instruct you to insert the formatted floppy disk:

SOURCE = X" SS DD FLOPPY DIR ENTRIES = 0128
DESTINATION = X" SS DD FLOPPY DIR ENTRIES = 0128

INTERNAL RAM MEMORY BUFFER SIZE = 42737 BYTES
OF SOURCE DISK TRACKS BUFFERED = 06

INSERT FLOPPY DISK #01 IN DRIVE B

HIT RETURN TO CONTINUE.... <CR>

Enter a carriage return to start the actual data transfer. The screen will display a single line of iterating numbers as BACKUP reads groups of tracks from the source disk and writes groups of tracks onto the formatted destination disk:

BACKUP IN PROGRESS
READING TRACK #00000 WRITING TRACK #00000

When all of the tracks have been copied, BACKUP will report its completion and prompt you to enter a carriage return:

BACKUP COMPLETE

HIT RETURN TO CONTINUE.... <CR>

Enter a carriage return. BACKUP will then return to its main menu:

*** DYNABYTE BACKUP UTILITY VER. X.X RUNNING UNDER CP/M ***

F = FILE BY FILE COPY

T = TRACK BY TRACK COPY

X = EXIT TO OPERATING SYSTEM

WHICH BACKUP MODE ? X<<CR>

Enter "X" followed by a carriage return to exit BACKUP and return to the operating system.

11. Remove Distribution Disk #2 from floppy drive "A".
12. Remove the new copy of Distribution disk #2 from floppy drive "B" and label it "Copy -- DOS 3.XX Distribution Disk #2 of 2".

YOU NOW HAVE COPIES OF THE TWO DOS 3 DISTRIBUTION DISKS THAT WERE SHIPPED WITH YOUR COMPUTER. REBOOT DOS 3 FROM EITHER OF THESE NEW COPIES.

2.2 Models 5505, 5605

5.25" Mini Winchester with one floppy drive (5.25" or 8")
Dynabyte Models 5505, 5605

When the 5505 or 5605 computer arrives, the Mini Winchester contains no installed software; DOS 3 is shipped on two floppy disks. You must, therefore, initially boot DOS 3 from one of the floppy disks. Both the 5505 and the 5605 can, however, easily be configured to boot DOS 3 from the Mini Winchester, and normally DOS 3 is transferred to the Mini Winchester and run from there. Booting DOS 3 from the Mini Winchester is faster and more convenient.

The procedure below describes how to copy the DOS 3 software, and how to configure DOS 3 to boot from the Mini Winchester. This procedure will configure the computer into six logical drives (you may have use of only three, depending on your model type): The Mini Winchester will be assigned to logical drives A and B, and the floppy drives will be assigned to logical drives C through F. Drives A and B will be of equal capacity; their actual size depends on the particular 5505 or 5605 model. You may wish to later reconfigure DOS 3 in some other manner. This procedure only describes a standard first-time installation.

METHOD 2 OVERVIEW

- Boot DOS 3 from Distribution Disk #1.
 - Format the Mini Winchester.
 - Copy the DOS 3 files from both distribution disks onto the Mini Winchester.
 - Format two floppy disks.
 - Copy the DOS 3 loading files to the formatted floppy disks.
 - Copy the DOS 3 files from the Mini Winchester to the "bootable" floppy disks.
 - Install DOS 3 onto the Mini Winchester.
 - Reboot DOS 3 from the Mini Winchester.
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Boot DOS 3 from Distribution Disk #1.

1. Turn on the computer.
2. Insert Distribution Disk #1.

Insert Distribution Disk #1 into the floppy drive, and close the door. (Insert an 8" floppy disk with its label face up; insert a 5.25" floppy disk so that its label faces the computer power switch.)

3. Press and release the reset button.

DOS 3 will automatically be read into the computer, and will then sign on with the following message:

```
DYNABYTE DOS 3.XX  
A>
```

The "A>" prompt indicates that DOS 3 is "logged" onto logical drive "A", and is ready for additional commands.

At this point, the loading process, also known as "booting", is complete.

Format the Mini Winchester.

1. Use WINFMT5 to format and check the 5.25" Mini Winchester.

A) WINFMT5<CR>

Enter "WINFMT5" followed by a carriage return. WINFMT5 will then sign on with the following menu and prompt:

***** DYNABYTE 5.25" HARD DISK FORMAT VERSION X.XX FOR DOS 3.XX *****

- CO) CHECK ONLY
- FC) FORMAT AND CHECK
- EK) RETURN TO OPERATING SYSTEM

YOUR SELECTION: FC<CR>

Enter "FC" followed by a carriage return. WINFMT5 will tell you that it has begun the formatting process, and then slowly display several rows of dots on the screen:

BEGIN FORMAT-ENTER ESC TO ABORT

When WINFMT5 has finished formatting the Mini Winchester, it will confirm its completion and then prompt you to choose a drive configuration:

FORMAT COMPLETE-00H BAD TRACKS WERE FOUND

CONFIGURATION OPTIONS

16MB HARD DISK DRIVE

- A) 1 DRIVE | 8.33 MB | 1024 DIRECTORY ENTRIES
- 1 DRIVE | 4.49 MB | 512 DIRECTORY ENTRIES

- B) 2 DRIVES | 6.4 MB | 512 DIRECTORY ENTRIES

- C) 4 DRIVES | 3.2 MB | 256 DIRECTORY ENTRIES

SELECT OPTION OR <RETURN> FOR DEFAULT (OPTION B): B<CR>

Enter a "B" followed by a carriage return to select drive configuration "B". Depending on your drive size, you may have different configuration options than listed above, but enter "B" in all cases.

WINFMT5 will tell you that it has begun the checking process, and then slowly display several more rows of dots on the screen:

BEGIN CHECK-ENTER ESC TO ABORT

```

.....
.....
.....
.....
    
```

After the drive has been formatted and checked, the bad track table will be displayed. Do not be alarmed; this display requires no action. WINFMT5 automatically scans the Mini Winchester for bad tracks, places these in tables, reports them to DOS 3, and substitutes good tracks in their place.

BAD TRACK TABLE				
1)	2)	3)	4)	5)
6)	7)	8)	9)	10)
11)	12)	13)	14)	15)
16)	17)	18)	19)	20)
21)	22)	23)	24)	25)
26)	27)	28)	29)	30)
31)	32)	33)	34)	35)
36)	37)	38)	39)	40)
41)	42)	43)	44)	45)
46)	47)	48)	49)	50)
51)	52)	53)	54)	55)
56)	57)	58)	59)	60)

"T*****" (LOGICAL BAD TRACK NUMBER)
 "H*,C****" (HEAD, CYLINDER NUMBER)

ENTER ONE OF THE ABOVE OPTIONS OR <RETURN> TO ACCEPT: <CR>

Enter a carriage return. If your drive size is not 16MB, a different number of tracks will be displayed than shown above.

WINFMT5 will confirm its completion of the check process and then prompt you enter a carriage return:

CHECK COMPLETED O.K.
PRESS <RETURN> TO DISPLAY MENU. <CR>

Enter a carriage return. WINFMT5 will then return to its main menu:

***** DYNABYTE 5.25" HARD DISK FORMAT VERSION X.XX FOR DOS 3.XX *****

- CO) CHECK ONLY
- FC) FORMAT AND CHECK
- EX) RETURN TO OPERATING SYSTEM

YOUR SELECTION: EX<CR>

Enter "EX" followed by a carriage return to exit WINFMT5 and return to the operating system.

Copy the DOS 3 files from both distribution disks onto the Mini Winchester.

1. Use PIP to copy the files from Distribution Disk #1 to the Mini Winchester.

A>PIP E:=A:*. *[OV]<CR>

Enter "PIP E:=A:*. *[OV]" followed by a carriage return. PIP will display the name of each DOS 3 file as it is copied from Distribution Disk #1 to the Mini Winchester, and then automatically return you to the operating system.

2. Remove Distribution Disk #1 from the floppy drive.
3. Insert Distribution Disk #2 into the floppy drive, and close the door.
4. Reset the floppy drive.

A><CTRL>C

Enter a "Control C" to inform the operating system that you have changed floppy disks. (To enter a "Control C", press and release the "C" key while the CTRL or CONTROL key is depressed.)

5. Use PIP to copy the files from Distribution Disk #2 to the Mini Winchester.

A>PIP E:=A:*. *[OV]<CR>

Enter "PIP E:=A:*. *[OV]" followed by a carriage return. PIP will display the name of each DOS 3 file as it is copied from Distribution Disk #2 to the Mini Winchester, and then automatically return you to the operating system.

6. Remove Distribution Disk #2 from the floppy drive.

Format two floppy disks.

1. Log onto the Mini Winchester.

A>E:<CR>

Enter "E:" followed by a carriage return to log onto the Mini Winchester.

E>

The "E>" prompt signifies that DOS 3 is connected to logical drive "E", and is ready for additional commands.

2. Use FFORMAT to format two floppy disks.

E>FFORMAT<CR>

Enter "FFORMAT" followed by a carriage return. FFORMAT will sign on with the following prompt:

DYNABYTE FLOPPY DISK FORMAT UTILITY

VERSION X.X FOR DOS 3.XX

ENTER DRIVE LETTER OF FLOPPY DRIVE (A-P): A<CR>

Enter "A" followed by a carriage return to specify the floppy drive. Depending on your computer system's drive type, you will then receive one of the following messages:

**DRIVE A IS A SINGLE SIDED 8 INCH DRIVE
 DRIVE A IS A DOUBLE SIDED 8 INCH DRIVE
 DRIVE A IS A SINGLE SIDED 5 1/4 INCH DRIVE
 DRIVE A IS A DOUBLE SIDED 5 1/4 INCH DRIVE
 CANNOT RECOGNIZE DRIVE TYPE
 NO ATTACHED DRIVE**

FFORMAT will then ask what function you would like to perform:

DO YOU WANT TO:

**F - FORMAT
 C - CHECK
 Q - QUIT**

YOUR SELECTION ? F<CR>

Enter "F" followed by a carriage return to indicate FORMAT.

If the drive is double-sided, FFORMAT will then ask whether you want one or both sides formatted:

SIDE FORMAT SELECTION

- 1 - FOR SINGLE SIDED
- 2 - FOR DOUBLE SIDED
- RETURN - FOR SINGLE SIDED

SIDE FORMAT ? 1<CR>

Enter "1" followed by a carriage return to indicate single-sided.

All 5.25" floppy drives are automatically double-density, but if you have an 8" floppy drive, then FFORMAT will prompt for single- or double-density:

DENSITY FORMAT SELECTION

- 1 - FOR SINGLE DENSITY
- 2 - FOR DOUBLE DENSITY
- RETURN - FOR DOUBLE DENSITY

DENSITY FORMAT ? <CR>

Enter a carriage return to indicate double-density.

FFORMAT will now ask you to enter the number of directory entries to reserve space for on the floppy disk:

NUMBER OF DIRECTORY ENTRIES

- 1 - FOR 64 ENTRIES
- 2 - FOR 128 ENTRIES
- 3 - FOR 256 ENTRIES
- RETURN - FOR 64 ENTRIES

OF DIRECTORY ENTRIES ? 2<CR>

Enter "2" followed by a carriage return to reserve space for 128 directory entries.

FFORMAT will then tell you to insert the floppy disk you want to format into the floppy drive:

INSERT DISK. HIT ESCAPE TO ABORT OR ANY OTHER KEY TO BEGIN ...

Insert a floppy disk into the floppy drive, and close the door.

CAUTION: FFORMAT will erase any data that exists on the floppy disk.

Also, be sure the floppy disk is not write-protected. You can write on an 8" floppy disk if the write-protect notch is covered up; you can write on a 5.25" floppy disk if the notch is uncovered.

<CR>

Enter a carriage return to start the actual formatting process. FFORMAT then tells you it is working and asks you to wait:

.... FORMATTING IS NOW BEING DONE PLEASE WAIT

If, during the formatting process, FFORMAT finds a bad sector on the floppy disk and is unable to format it, the error will be reported as follows:

**HARD ERROR AT TRACK=XX SECTOR=XX
!!! BAD DISKETTE REPLACE WITH A NEW ONE !!!**

A damaged floppy disk should be removed and discarded. Start the format process on another floppy disk.

After the floppy disk has been formatted, FFORMAT will confirm its completion and then ask if you want to format another floppy disk:

******* FORMAT COMPLETED O.K. *******

REPEAT SAME OPERATION ON A NEW DISK (Y/N) ?

Remove the newly formatted floppy disk from the floppy drive.

Y<CR>

Enter "Y" followed by a carriage return. FFORMAT will then tell you to insert a floppy disk into the drive:

INSERT DISK. HIT ESCAPE TO ABORT OR ANY OTHER KEY TO BEGIN ...

Insert another floppy disk into the floppy drive, and close the door.

<CR>

Enter a carriage return to start the formatting process. FFORMAT tells you it is working and asks you to wait:

.... FORMATTING IS NOW BEING DONE PLEASE WAIT

Again, if FFORMAT reports a bad sector, the damaged floppy disk should be discarded and the format process tried on a another disk.

After the floppy disk has been formatted, FFORMAT will confirm its completion and then ask if you want to format another floppy disk:

***** FORMAT COMPLETED O.K. *****

REPEAT SAME OPERATION ON A NEW DISK (Y/N) ? N<CR>

Enter "N" followed by a carriage return. FFORMAT will then return to its main menu:

DO YOU WANT TO:

F - FORMAT
C - CHECK
Q - QUIT

YOUR SELECTION ?

3. Remove the newly formatted floppy disk from the floppy drive.
4. Insert Distribution Disk #1 into the floppy drive, and close the door.
5. Exit FFORMAT.

YOUR SELECTION ? Q<CR>

Enter "Q" followed by a carriage return to exit FFORMAT and return to the operating system:

E>

6. Remove Distribution Disk #1 from the floppy drive.
(Be sure to wait until after the "E>" prompt returns.)

Copy the DOS 3 loading files to the formatted floppy disks.

1. Use DYNAGEN to copy the DOS 3 loading files to the outer two tracks of the newly formatted floppy disks.

E>DYNAGEN<CR>

Enter "DYNAGEN" followed by a carriage return. (You are still logged onto the Mini Winchester on drive "E".) DYNAGEN will then sign on with the following menu and prompt:

DYNAGEN VERSION X.XX FOR DYNABYTE DOS 3.XX

GENERATE SYSTEM DISK

	TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER	
	CT)	TRANSFER SYSTEM USING ".COM" BOOT FILE	
	EX)	EXIT DYNAGEN	

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? CT<CR>

Enter "CT" followed by a carriage return. DYNAGEN will then ask you to identify the source drive:

(CT) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? E<CR>

Enter "E" followed by a carriage return to specify the Mini Winchester as the source drive. DYNAGEN will then prompt for the destination drive:

WRITE SYSTEM TO DISK DRIVE (A-P) ? A<CR>

Enter "A" followed by a carriage return to specify the floppy drive as the destination drive. DYNAGEN will then prompt you to insert the floppy disk:

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE.

Insert one of the formatted floppy disks into the floppy drive, and close the door.

<CR>

Enter a carriage return to start the actual copying process. DYNAGEN then tells you it is working and asks you to wait:

PLEASE WAIT. WRITING SYSTEM TO FLOPPY DRIVE A.

When DYNAGEN has finished writing the loading instructions, it will prompt you to enter a carriage return:

PRESS <RETURN> TO DISPLAY MENU. <CR>

Enter a carriage return. DYNAGEN will then return to its main menu:

DYNAGEN VERSION X.XX FOR DYNABYTE DOS 3.XX

GENERATE SYSTEM DISK

	TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER	
	CT)	TRANSFER SYSTEM USING ".COM" BOOT FILE	
	EX)	EXIT DYNAGEN	

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? CT<CR>

Enter "CT" followed by a carriage return to copy the DOS 3 loading instructions to the other formatted floppy disk. DYNAGEN will then ask you to identify the source drive:

(CT) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? E<CR>

Enter "E" followed by a carriage return to specify the Mini Winchester as the source drive. DYNAGEN will then prompt for the destination drive:

WRITE SYSTEM TO DISK DRIVE (A-P) ? A<CR>

Enter "A" followed by a carriage return to specify the floppy drive as the destination drive. DYNAGEN will then prompt you to insert the floppy disk:

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE.

Remove the first floppy disk from the floppy drive, insert the remaining formatted floppy disk in its place, and close the door.

<CR>

Enter a carriage return to start the actual copying process. DYNAGEN then tells you it is working and asks you to wait:

PLEASE WAIT. WRITING SYSTEM TO FLOPPY DRIVE A.

When DYNAGEN has finished writing the loading instructions, it will prompt you to enter a carriage return:

PRESS <RETURN> TO DISPLAY MENU. <CR>

Enter a carriage return. DYNAGEN will then return to its main menu:

DYNAGEN VERSION X.XX FOR DYNABYTE DOS 3.XX

GENERATE SYSTEM DISK

TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER	
CT)	TRANSFER SYSTEM USING ".COM" BOOT FILE	
EX)	EXIT DYNAGEN	

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? EX<CR>

Enter "EX" followed by a carriage return to exit DYNAGEN and return to the operating system.

Both of the formatted floppy disks are now "bootable"; that is, DOS 3 can now be booted from either of them.

Leave the new "bootable" floppy disk in the floppy drive.

Copy the DOS 3 files from the Mini Winchester to the "bootable" floppy disks.

1. Log onto the floppy drive because the subsequent SUBMIT operations must be performed from drive A.

E>A:<CR>

Enter "A:" followed by a carriage return to log onto the floppy drive.

A>

The "A>" prompt signifies that DOS 3 is connected to logical drive "A", and is ready for additional commands.

2. Copy the Distribution Disk #1 files from the Mini Winchester to the floppy disk that was left in the floppy drive.

A>E:SUBMIT E:COPY1 E A<CR>

Enter "E:SUBMIT E:COPY1 E A" followed by a carriage return. Enter this command exactly as shown; the spaces are very important.

"COPY1" is the name of a SUBMIT file stored with DOS 3 that contains file copying instructions for Distribution Disk #1. The appropriate files will automatically be copied from source drive "E" to destination drive "A".

When all the files have been copied, the following message will be displayed on the screen:

A>; DISTRIBUTION TRANSFER FOR DISK #1 COMPLETE

3. Remove the new copy of Distribution Disk #1 from the floppy drive and label it "Copy — DOS 3.XX Distribution Disk #1 of 2".
4. Insert the remaining "bootable" floppy disk into the floppy drive, and close the door.
5. Reset the floppy drive.

A><CTRL>C

Enter a "Control C" to inform the operating system that you have changed floppy disks.

6. Copy the Distribution Disk #2 files from the Mini Winchester to the floppy drive.

A>E:SUBMIT E:COPY2 E A<CR>

Enter "E:SUBMIT E:COPY2 E A" followed by a carriage return. Enter this command exactly as shown; the spaces are very important.

"COPY2" is the name of a SUBMIT file stored with DOS 3 that contains file transfer instructions for Distribution Disk #2. The appropriate files will automatically be copied from source drive "E" to destination drive "A".

When all the files have been copied, the following message will be displayed on the screen:

A>; DISTRIBUTION DISK #2 TRANSFER COMPLETE

7. Remove the new copy of Distribution Disk #2 from the floppy drive and label it "Copy — DOS 3.XX Distribution Disk #2 of 2".

YOU NOW HAVE COPIES OF THE TWO DOS 3 DISTRIBUTION DISKS THAT WERE SHIPPED WITH YOUR COMPUTER.

Install DOS 3 onto the Mini Winchester.

1. Insert either of the new copies of the distribution disks into the floppy drive, and close the door.
2. Log onto the Mini Winchester.

A>E:<CR> Enter "E:" followed by a carriage return to log onto the Mini Winchester.

E> The "E>" prompt signifies that DOS 3 is connected to logical drive "E", and is ready for additional commands.

3. Use DYNASYS to change the disk drive assignments, and to save the new system configuration onto the Mini Winchester.

E>DYNASYS<CR> Enter "DYNASYS" followed by a carriage return. DYNASYS will sign-on with the following menu and prompt:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

MAIN MENU OPTIONS

- | | |
|-----|-------------------------------|
| AL) | ASSIGN / SETUP ALL PARAMETERS |
| SC) | SET CLEAR SCREEN SEQUENCE |
| CA) | CHARACTER I/O ASSIGNMENTS |
| CS) | CHARACTER I/O SETUP |
| DA) | DISK DRIVE ASSIGNMENTS |
| DS) | DISK DRIVE SETUP |
| CM) | CHAIN MODULE SETUP |
| DL) | DISK LOG / MESSAGE SETUP |
| LS) | LOAD / SAVE PARAMETER FILE |
| DC) | DISPLAY CURRENT CONFIGURATION |
| CD) | CREATE SYSTEM DISK |
| EX) | EXIT TO OPERATING SYSTEM |

ENTER MENU ITEM? DA<CR> Enter "DA" followed by a carriage return to reassign the logical disk drives. DYNASYS will respond with the current disk drive assignments, and then prompt you to enter the letter of the drive assignment you want to change:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK DRIVE ASSIGNMENTS

F1 - F4 = FLOPPY DISK DRIVES
 CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
 CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
 FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
 MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
 MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = F1	E: = MINI1	I: =	M: =
B: = F2	F: = MINI2	J: =	N: =
C: = F3	G: = FUJ1	K: =	O: =
D: = F4	H: = FUJ2	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? A<CR>

Enter "A" followed by a carriage return to begin reassigning the logical drives, starting with logical drive "A". DYNASYS will then continue to prompt you for subsequent drive assignments until you respond to one of the prompts with nothing but a carriage return. Reassign the drives as shown here:

DRIVE A: MINI1<CR>
 DRIVE B: MINI2<CR>
 DRIVE C: F1<CR>
 DRIVE D: F2<CR>
 DRIVE E: F3<CR>
 DRIVE F: F4<CR>
 DRIVE G: <CR>

Enter a carriage return after the "DRIVE G:" prompt. DYNASYS will stop prompting for logical drives, and display the new disk drive assignments. DYNASYS will then prompt you to enter the letter of another drive assignment you want to change:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK DRIVE ASSIGNMENTS

F1 - F4 = FLOPPY DISK DRIVES
 CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
 CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
 FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
 MIN11 - MIN18 = MINI WINCHESTER (5 1/4")
 MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = MIN11	E: = F3	I: =	M: =
B: = MIN12	F: = F4	J: =	N: =
C: = F1	G: = FUJ1	K: =	O: =
D: = F2	H: = FUJ2	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? G<CR>

Enter "G" followed by a carriage return. DYNASYS will respond with the following prompt:

DRIVE G: <CR>

Enter a carriage return to clear the preset assignment from logical drive "G". DYNASYS will again display the new drive assignments, and then prompt you to enter the letter of another drive assignment you want to change:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK DRIVE ASSIGNMENTS

F1 - F4 = FLOPPY DISK DRIVES
 CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
 CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
 FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
 MIN11 - MIN18 = MINI WINCHESTER (5 1/4")
 MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = MIN11	E: = F3	I: =	M: =
B: = MIN12	F: = F4	J: =	N: =
C: = F1	G: =	K: =	O: =
D: = F2	H: = FUJ2	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? H<CR>

Enter "H" followed by a carriage return. DYNASYS will respond with the following prompt:

DRIVE H: <CR>

Enter a carriage return to clear the preset assignment from logical drive "H". DYNASYS will again display the new disk drive assignments, and then prompt you to confirm the displayed assignments by entering a carriage return:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK DRIVE ASSIGNMENTS

F1 - F4 = FLOPPY DISK DRIVES
CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = MINI1	E: = F3	I: =	M: =
B: = MINI2	F: = F4	J: =	N: =
C: = F1	G: =	K: =	O: =
D: = F2	H: =	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? <CR>

Enter a carriage return to confirm the displayed assignments. DYNASYS will then return to its main menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

AL)	ASSIGN / SETUP ALL PARAMETERS
SC)	SET CLEAR SCREEN SEQUENCE
CA)	CHARACTER I/O ASSIGNMENTS
CS)	CHARACTER I/O SETUP
DA)	DISK DRIVE ASSIGNMENTS
DS)	DISK DRIVE SETUP
CM)	CHAIN MODULE SETUP
DL)	DISK LOG / MESSAGE SETUP
LS)	LOAD / SAVE PARAMETER FILE
DC)	DISPLAY CURRENT CONFIGURATION
CD)	CREATE SYSTEM DISK
EX)	EXIT TO OPERATING SYSTEM

ENTER MENU ITEM? DL<CR>

Enter "DL" followed by a carriage return to reassign drive "A" as the warm reboot drive. DYNASYS will respond with the current disk log assignments, and then prompt you to choose one of the following options:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK LOG / MESSAGE SETUP

CL)	COLD BOOT LOG DRIVE = A
WR)	WARM REBOOT DRIVE = A
CM)	COLD BOOT MESSAGE FILE = NOT INSTALLED
DL)	DISPLAY LOAD MAP = YES

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ? WR<CR>

Enter "WR" followed by a carriage return. DYNASYS will then prompt for the letter of the logical drive to be logged on during a warm boot. (A warm boot occurs whenever you enter a Control C, or whenever a program finishes running.)

(WR) WARM REBOOT DRIVE (A-P) ? A<CR>

Enter "A" followed by a carriage return to specify the Mini Winchester as the warm reboot drive. DYNASYS

will then prompt you for the remaining two items on the menu. Enter a carriage return following each prompt to leave that assignment stand:

(CM) COLD BOOT MESSAGE FILE (FILENAME.TYP) ? <CR>

(DL) PRINT LOAD MAP DURING COLD BOOT (Y-YES/N-NO) ? <CR>

DYNASYS will display the new disk log assignments, and then prompt you to confirm the displayed assignments by entering a carriage return:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK LOG / MESSAGE SETUP

CL)	COLD BOOT LOG DRIVE = A
WR)	WARM REBOOT DRIVE = A
CM)	COLD BOOT MESSAGE FILE = NOT INSTALLED
DL)	DISPLAY LOAD MAP = YES

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ? <CR>

Enter a carriage return to confirm the displayed assignments. DYNASYS will then return to its main menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

AL)	ASSIGN / SETUP ALL PARAMETERS
SC)	SET CLEAR SCREEN SEQUENCE
CA)	CHARACTER I/O ASSIGNMENTS
CS)	CHARACTER I/O SETUP
DA)	DISK DRIVE ASSIGNMENTS
DS)	DISK DRIVE SETUP
CM)	CHAIN MODULE SETUP
DL)	DISK LOG / MESSAGE SETUP
LS)	LOAD / SAVE PARAMETER FILE
DC)	DISPLAY CURRENT CONFIGURATION
CD)	CREATE SYSTEM DISK
EX)	EXIT TO OPERATING SYSTEM

ENTER MENU ITEM? CD<CR> Enter "CD" followed by a carriage return to write the new system

configuration onto the Mini Winchester. DYNASYS will respond with the CREATE SYSTEM DISK menu, and prompt you to choose one of two methods:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

CREATE SYSTEM DISK

WR)	WRITE SYSTEM TO DISK
TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU)? **WR<CR>**

Enter "WR" followed by a carriage return. DYNASYS will then ask you to identify the source drive:

(WR) SYSTEM FILES LOCATED ON DISK DRIVE (A-P)? **E<CR>**

Enter "E" followed by a carriage return to specify the Mini Winchester as the source drive. (Remember, the Mini Winchester will not be assigned to logical drive "A" until after DOS 3 has been rebooted.) DYNASYS will then prompt for the destination drive:

WRITE SYSTEM TO DISK DRIVE (A-P)? **E<CR>**

Enter "E" followed by a carriage return to specify the Mini Winchester as the destination drive. DYNASYS will then prompt you to place the proper disks into the proper drives:

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE. **<CR>**

Enter a carriage return to start the actual writing process. (NOTE: It is important that a "bootable" disk be in the floppy drive before entering a carriage return.) DYNASYS then tells you it is working and asks you to wait:

NOW WRITING SYSTEM, PLEASE WAIT.

When DYNASYS has finished writing the new system configuration, it will prompt you to enter a carriage return:

PRESS <RETURN> TO DISPLAY MENU. CR

Enter a carriage return. DYNASYS will return to the "CD" menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CREATE SYSTEM DISK

```
| WR) WRITE SYSTEM TO DISK |
| TR) TRANSFER SYSTEM FROM ONE DISK TO ANOTHER |
```

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU)? <CR>

Enter a carriage return. DYNASYS will then return to its main menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

```
| AL) ASSIGN / SETUP ALL PARAMETERS |
| SC) SET CLEAR SCREEN SEQUENCE |
| CA) CHARACTER I/O ASSIGNMENTS |
| CS) CHARACTER I/O SETUP |
| DA) DISK DRIVE ASSIGNMENTS |
| DS) DISK DRIVE SETUP |
| CM) CHAIN MODULE SETUP |
| DL) DISK LOG / MESSAGE SETUP |
| LS) LOAD / SAVE PARAMETER FILE |
| DC) DISPLAY CURRENT CONFIGURATION |
| CD) CREATE SYSTEM DISK |
| EX) EXIT TO OPERATING SYSTEM |
```

ENTER MENU ITEM? EX<CR>

Enter "EX" followed by a carriage return to exit DYNASYS and return to the operating system:

E>

4. Remove the floppy disk from the floppy drive.

Reboot DOS 3 from the Mini Winchester.

Make sure that no floppy disk is in the floppy disk drive. Press and release the reset button. The computer will now boot DOS 3 from the Mini Winchester.

The computer is now configured as a six drive system. Drives A and B are on the Mini Winchester, and Drives C through F are the floppy drives. This can be seen from the following list of disk drive assignments, as it would appear using DYNASTAT:

DISK DRIVE
ASSIGN
A:MINI1
B:MINI2
C:F1
D:F2
E:F3
F:F4
G:
H:

2.3 Model 5615

8" Fujitsu Winchester with one 8" floppy drive
Dynabyte Model 5615

When the 5615 computer arrives, the Fujitsu contains no installed software; DOS 3 is shipped on two 8" floppy disks. You must, therefore, initially boot DOS 3 from one of the floppy disks. If you have a tape controller (Funnel interface) board, the 5615 can, however, easily be configured to boot DOS 3 from the Fujitsu. Booting DOS 3 from the Fujitsu is faster and more convenient.

The procedure below describes how to copy the DOS 3 software, and, if you have the tape controller board, how to configure the operating system to cold boot from the Fujitsu. If you don't have the tape controller board, this procedure describes how to configure DOS 3 to cold boot from the floppy drive and warm boot from the Fujitsu.

If you have a 23 megabyte drive, this procedure will configure the 5615 into eight logical drives (you may have use of only five of these depending on your model). The Fujitsu will be assigned to logical drives A through D, and the floppy drives will be assigned to logical drives E through H. Drives A through D will be of equal capacity; their actual size will be 4.7 megabytes each.

If you have an 11 megabyte drive, this procedure will instead configure the 5615 into six logical drives (you may have use of only three of these depending on your model). The Fujitsu will be assigned to logical drives A and B, and the floppy drives will be assigned to logical drives C through F. Drives A and B will be of equal capacity; their actual size will be 4.7 megabytes each.

You may wish to later reconfigure DOS 3 in some other manner. This procedure only describes a standard first-time installation.

METHOD 3 OVERVIEW

- Boot DOS 3 from Distribution Disk #1.
 - Format the Fujitsu.
 - Copy the DOS 3 files from both distribution disks onto the Fujitsu.
 - Format two floppy disks.
 - Copy the DOS 3 loading instructions to the formatted floppy disks.
 - Copy the DOS 3 files from the Fujitsu to the "bootable" floppy disks.
 - Install DOS 3.
 - Reboot DOS 3.
-

Boot DOS 3 from Distribution Disk #1.

1. Turn on the computer.
2. Insert Distribution Disk #1.

Insert Distribution Disk #1 into the floppy drive and close the door. (Insert the 8" floppy disk with its label face up.)

3. Press and release the reset button.

DOS 3 will automatically be read into the computer, and will then sign on with the following message:

DYNABYTE DOS 3.XX

A>

The "A>" prompt indicates that DOS 3 is "logged" onto logical drive "A", and is ready for additional commands.

At this point, the loading process, also known as "booting", is complete.

 Format the Fujitsu.

1. Use FUJFMT to format the 8" Fujitsu hard disk drive.

A>FUJFMT<CR>

Enter "FUJFMT" followed by a carriage return. FUJFMT will then sign on with the following menu and prompt:

DYNABYTE FUJITSU WINCHESTER FORMAT UTILITY

VERSION X.X FOR DOS 3.XX

ENTER F - FORMAT
 C - CHECK
 <RETURN> - RETURN TO OPERATING SYSTEM

YOUR SELECTION ? F<CR>

Enter "F" followed by a carriage return. FUJFMT will then prompt for the size of the Fujitsu you are formatting (11 or 23 megabyte):

SELECT THE DRIVE TYPE:

0 - 11 MEGABYTE DRIVE.
 1 - 23 MEGABYTE DRIVE.

ENTER DRIVE TYPE (0 OR 1) ? 0<CR> or 1<CR>

You should enter either "0" for an 11 megabyte drive or "1" for a 23 megabyte drive, depending on your drive size.

FUJFMT will then prompt you to choose a configuration:

DRIVE CONFIGURATION

A		B		C
FUJ1 - 8.3 MB	:	FUJ1 - 4.7 MB	:	FUJ1 - 2.3 MB
FUJ2 - 1.2 MB	:	FUJ2 - 4.7 MB	:	FUJ2 - 2.3 MB
FUJ3 - 8.3 MB	:	FUJ3 - 4.7 MB	:	FUJ3 - 2.3 MB
FUJ4 - 1.2 MB	:	FUJ4 - 4.7 MB	:	FUJ4 - 2.3 MB
				FUJ5 - 2.3 MB
				FUJ6 - 2.3 MB
				FUJ7 - 2.3 MB
				FUJ8 - 2.3 MB

PLEASE ENTER DRIVE CONFIGURATION OR <RETURN> FOR B ? B<CR>

Enter "B" followed by a carriage return to select drive configuration "B". Only half of the drives listed above will be displayed if you have an 11 megabyte drive.

FUJFMT will tell you that it has begun the formatting process, and then slowly display several rows of periods on the screen:

FORMAT IN PROGRESS.

.....
.....
.....
.....

When FUJFMT has finished formatting the Fujitsu, the bad track table will be displayed.

BAD TRACK TABLE

<u>FIRST 10 MEGABYTES</u>				<u>SECOND 10 MEGABYTES</u>				
<u>BAD TRACK</u>		<u>- GOOD TRACK</u>		:	<u>BAD TRACK</u>		<u>- GOOD TRACK</u>	
0 -	0000H	-	0001H	:	9 -	0000H	-	0001H
1 -	0000H	-	0002H	:	10-	0000H	-	0002H
2 -	0000H	-	0003H	:	11-	0000H	-	0003H
3 -	0000H	-	0004H	:	12-	0000H	-	0004H
4 -	0000H	-	0005H	:	13-	0000H	-	0005H
5 -	0000H	-	0006H	:	14-	0000H	-	0006H
6 -	0000H	-	0007H	:	15-	0000H	-	0007H
7 -	0000H	-	0008H	:	16-	0000H	-	0008H
8 -	0000H	-	0009H	:	17-	0000H	-	0009H

ENTER ITEM TO CHANGE OR <RETURN> TO ACCEPT ? <CR>

Enter a carriage return. FUJFMT will automatically return you to the operating system:

FORMAT COMPLETE.

A>

After the disk is formatted, you must enter FUJFMT a second time to check for bad tracks.

A>FUJFMT<CR>

FUJFMT will then sign on with the following menu and prompt:

DYNABYTE FUJITSU WINCHESTER FORMAT UTILITY

VERSION X.X FOR DOS 3.XX

ENTER F - FORMAT
 C - CHECK
 <RETURN> - RETURN TO OPERATING SYSTEM

YOUR SELECTION ? C<CR>

Enter "C" followed by a carriage return. FUJFMT will then prompt for the size of the Fujitsu you are formatting (11 or 23 megabyte):

SELECT THE DRIVE TYPE:

0 - 11 MEGABYTE DRIVE.
 1 - 23 MEGABYTE DRIVE.

ENTER DRIVE TYPE (0 OR 1) ? 0<CR> or 1<CR>

You should enter either "0" for an 11 megabyte drive or "1" for a 23 megabyte drive, depending on your drive size.

FUJFMT will then display your chosen configuration and the bad track table:

CURRENT DISK CONFIGURATION

FUJ1 - 4.7 MB : FUJ2 - 4.7 MB : FUJ3 - 4.7 MB : FUJ4 - 4.7 MB

BAD TRACK TABLE

<u>FIRST 10 MEGABYTES</u>				<u>SECOND 10 MEGABYTES</u>				
<u>BAD TRACK</u>		<u>- GOOD TRACK</u>		:	<u>BAD TRACK</u>		<u>- GOOD TRACK</u>	
0 -	0000H	-	0001H	:	9 -	0000H	-	0001H
1 -	0000H	-	0002H	:	10-	0000H	-	0002H
2 -	0000H	-	0003H	:	11-	0000H	-	0003H
3 -	0000H	-	0004H	:	12-	0000H	-	0004H
4 -	0000H	-	0005H	:	13-	0000H	-	0005H
5 -	0000H	-	0006H	:	14-	0000H	-	0006H
6 -	0000H	-	0007H	:	15-	0000H	-	0007H
7 -	0000H	-	0008H	:	16-	0000H	-	0008H
8 -	0000H	-	0009H	:	17-	0000H	-	0009H

PLEASE PRESS <RETURN> TO CONTINUE TEST ? <CR>

If a bad track is reported, make a note of it so that you can enter that value during your next pass through FUJFMT. A bad track will be displayed as:

.....
.....
READ ERROR AT TRACK 40H ON FIRST TEN MEGABYTES.....
.....

When FUJFMT has finished checking, it will display the following and return to the operating system:

CHECK COMPLETE
A>

Then enter FUJFMT again and select the F-FORMAT option to enter the bad tracks in the Bad Track Table.

A>FUJFMT<CR>

DYNABYTE FUJITSU WINCHESTER FORMAT UTILITY

VERSION X.X FOR DOS 3.XX

ENTER F - FORMAT
 C - CHECK
 <RETURN> - RETURN TO OPERATING SYSTEM

YOUR SELECTION ? F<CR>

Enter "F" followed by a carriage return. FUJFMT will then prompt for the size of the Fujitsu you are formatting (11 or 23 megabyte):

SELECT THE DRIVE TYPE:

0 - 11 MEGABYTE DRIVE.
1 - 23 MEGABYTE DRIVE.

ENTER DRIVE TYPE (0 OR 1) ? 0<CR> or 1<CR>

You should enter either "0" for an 11 megabyte drive or "1" for a 23 megabyte drive, depending on your drive size.

FUJFMT will then prompt you to choose a configuration:

DRIVE CONFIGURATION

<u>A</u>	<u>B</u>	<u>C</u>
FUJ1 - 8.3 MB	FUJ1 - 4.7 MB	FUJ1 - 2.3 MB
FUJ2 - 1.2 MB	FUJ2 - 4.7 MB	FUJ2 - 2.3 MB
FUJ3 - 8.3 MB	FUJ3 - 4.7 MB	FUJ3 - 2.3 MB
FUJ4 - 1.2 MB	FUJ4 - 4.7 MB	FUJ4 - 2.3 MB
		FUJ5 - 2.3 MB
		FUJ6 - 2.3 MB
		FUJ7 - 2.3 MB
		FUJ8 - 2.3 MB

PLEASE ENTER DRIVE CONFIGURATION OR <RETURN> FOR B ? B<CR>

Enter "B" followed by a carriage return to select drive configuration "B". Only half of the drives listed above will be displayed if you have an 11 megabyte drive.

FUJFMT will tell you that it has begun the formatting process, and then slowly display several rows of periods on the screen:

FORMAT IN PROGRESS.

.....

 ...

When FUJFMT has finished formatting the Fujitsu, the bad track table will be displayed.

BAD TRACK TABLE

<u>FIRST 10 MEGABYTES</u>				<u>SECOND 10 MEGABYTES</u>			
<u>BAD TRACK</u>	<u>-</u>	<u>GOOD TRACK</u>	:	<u>BAD TRACK</u>	<u>-</u>	<u>GOOD TRACK</u>	:
0 -	0000H	-	0001H	9 -	0000H	-	0001H
1 -	0000H	-	0002H	10-	0000H	-	0002H
2 -	0000H	-	0003H	11-	0000H	-	0003H
3 -	0000H	-	0004H	12-	0000H	-	0004H
4 -	0000H	-	0005H	13-	0000H	-	0005H
5 -	0000H	-	0006H	14-	0000H	-	0006H
6 -	0000H	-	0007H	15-	0000H	-	0007H
7 -	0000H	-	0008H	16-	0000H	-	0008H
8 -	0000H	-	0009H	17-	0000H	-	0009H

ENTER ITEM TO CHANGE OR <RETURN> TO ACCEPT ? 0<CR>

Enter a 0 to specify that item #0 is to be changed.

ENTER BAD TRACK (IN HEX) ? 40<CR>

Type 40 to enter track 40H as bad.

The Bad Track Table is displayed with the new entry.

BAD TRACK TABLE

<u>FIRST 10 MEGABYTES</u>				<u>SECOND 10 MEGABYTES</u>				
<u>BAD TRACK</u>		<u>- GOOD TRACK</u>		:	<u>BAD TRACK</u>		<u>- GOOD TRACK</u>	
0 -	0040H	-	0001H	:	9 -	0000H	-	0001H
1 -	0000H	-	0002H	:	10-	0000H	-	0002H
2 -	0000H	-	0003H	:	11-	0000H	-	0003H
3 -	0000H	-	0004H	:	12-	0000H	-	0004H
4 -	0000H	-	0005H	:	13-	0000H	-	0005H
5 -	0000H	-	0006H	:	14-	0000H	-	0006H
6 -	0000H	-	0007H	:	15-	0000H	-	0007H
7 -	0000H	-	0008H	:	16-	0000H	-	0008H
8 -	0000H	-	0009H	:	17-	0000H	-	0009H

ENTER ITEM TO CHANGE OR <RETURN> TO ACCEPT ? <CR>

You may continue entering any bad tracks found by the check performed earlier or enter a <CR> when all of the bad tracks have been found.

FORMAT COMPLETE.

A>

Copy the DOS 3 files from both distribution disks onto the Fujitsu.

1. Use PIP to copy the files from Distribution Disk #1 to the Fujitsu.

A>PIP G:=A:*. *[OV]<CR>

Enter "PIP G:=A:*. *[OV]" followed by a carriage return. PIP will display the name of each DOS 3 file as it is copied from Distribution Disk #1 to the Fujitsu, and then automatically return you to the operating system.

2. Remove Distribution Disk #1 from the floppy drive.
3. Insert Distribution Disk #2 into the floppy drive, and close the door.
4. Reset the floppy drive.

A><CTRL>C

Enter a "Control C" to inform the operating system that you have changed floppy disks. (To enter a "Control C", press and release the "C" key while the CTRL or CONTROL key is depressed.)

5. Use PIP to copy the files from Distribution Disk #2 to the Fujitsu.

A>PIP G:=A:*. *[OV]<CR>

Enter "PIP G:=A:*. *[OV]" followed by a carriage return. PIP will display the name of each DOS 3 file as it is copied from Distribution Disk #2 to the Fujitsu, and then automatically return you to the operating system.

6. Remove Distribution Disk #2 from the floppy drive.

 Format two floppy disks.

1. Log onto the Fujitsu.

A>G:<CR>

Enter "G:" followed by a carriage return to log onto the Fujitsu.

G>

The "G>" prompt signifies that DOS 3 is connected to logical drive "G", and is ready for additional commands.

2. Use FFORMAT to format two floppy disks.

G>FFORMAT<CR>

Enter "FFORMAT" followed by a carriage return. FFORMAT will sign on with the following prompt:

 DYNABYTE FLOPPY DISK FORMAT UTILITY

VERSION X.X FOR DOS 3.XX

ENTER DRIVE LETTER OF FLOPPY DRIVE (A-P): **A<CR>**

Enter "A" followed by a carriage return to specify the floppy drive. Depending on your computer system's drive type, you will then receive one of the following messages:

DRIVE A IS A SINGLE SIDED 8 INCH DRIVE
 DRIVE A IS A DOUBLE SIDED 8 INCH DRIVE
 CANNOT RECOGNIZE DRIVE TYPE
 NO ATTACHED DRIVE

FFORMAT will then ask what function you would like to perform:

DO YOU WANT TO:

F - FORMAT
 C - CHECK
 Q - QUIT

YOUR SELECTION ? **F<CR>**

Enter "F" followed by a carriage return to indicate FORMAT.

FFORMAT will then ask whether you want one or both sides formatted:

SIDE FORMAT SELECTION

- 1 - FOR SINGLE SIDED
- 2 - FOR DOUBLE SIDED
- RETURN - FOR SINGLE SIDED

SIDE FORMAT ? 1<CR>

Enter "1" followed by a carriage return to indicate single-sided.

FFORMAT will then prompt for single- or double-density:

DENSITY FORMAT SELECTION

- 1 - FOR SINGLE DENSITY
- 2 - FOR DOUBLE DENSITY
- RETURN - FOR DOUBLE DENSITY

DENSITY FORMAT ? <CR>

Enter a carriage return to indicate double-density.

FFORMAT will now ask you to enter the number of directory entries to reserve space for on the floppy disk:

NUMBER OF DIRECTORY ENTRIES

- 1 - FOR 64 ENTRIES
- 2 - FOR 128 ENTRIES
- 3 - FOR 256 ENTRIES
- RETURN - FOR 64 ENTRIES

OF DIRECTORY ENTRIES ? 2<CR>

Enter "2" followed by a carriage return to reserve space for 128 directory entries.

FFORMAT will then tell you to insert the floppy disk you want to format into the floppy drive:

INSERT DISK. HIT ESCAPE TO ABORT OR ANY OTHER KEY TO BEGIN ...

Insert a floppy disk into the floppy drive, and close the door.

CAUTION: FFORMAT will erase any data that exists on the floppy disk.

Also, be sure the floppy disk is not write-protected. You can write on an 8" floppy disk if the write-protect notch is covered up.

<CR>

Enter a carriage return to start the actual formatting process. FFORMAT then tells you it is working and asks you to wait:

.... FORMATTING IS NOW BEING DONE PLEASE WAIT

If, during the formatting process, FFORMAT finds a bad sector on the floppy disk and is unable to format it, the error will be reported as follows:

HARD ERROR AT TRACK=XX SECTOR=XX
!!! BAD DISKETTE REPLACE WITH A NEW ONE !!!

A damaged floppy disk should be removed and discarded. Start the format process on another floppy disk.

After the floppy disk has been formatted, FFORMAT will confirm its completion and then ask if you want to format another floppy disk:

***** FORMAT COMPLETED O.K. *****

REPEAT SAME OPERATION ON A NEW DISK (Y/N) ?

Remove the newly formatted floppy disk from the floppy drive.

Y<CR>

Enter "Y" followed by a carriage return. FFORMAT will then tell you to insert a floppy disk into the drive:

INSERT DISK. HIT ESCAPE TO ABORT OR ANY OTHER KEY TO BEGIN ...

Insert another floppy disk into the floppy drive, and close the door.

<CR>

Enter a carriage return to start the formatting process. FFORMAT tells you it is working and asks you to wait:

.... FORMATTING IS NOW BEING DONE PLEASE WAIT

Again, if FFORMAT reports a bad sector, the damaged floppy disk should be discarded and the format process tried on another disk.

After the floppy disk has been formatted, FFORMAT will confirm its completion and then ask if you want to format another floppy disk:

***** FORMAT COMPLETED O.K. *****

REPEAT SAME OPERATION ON A NEW DISK (Y/N) ? N<CR>

Enter "N" followed by a carriage return. FFORMAT will then return to its main menu:

DO YOU WANT TO:

F - FORMAT
C - CHECK
Q - QUIT

YOUR SELECTION ?

3. Remove the newly formatted floppy disk from the floppy drive.
4. Insert Distribution Disk #1 into the floppy drive, and close the door.
5. Exit FFORMAT.

YOUR SELECTION ? Q<CR>

Enter "Q" followed by a carriage return to exit FFORMAT and return to the operating system:

G>

6. Remove Distribution Disk #1 from the floppy drive.
(Be sure to wait until after the "G>" prompt returns.)

Copy the DOS 3 loading instructions to the formatted floppy disks.

1. Use DYNAGEN to copy the DOS 3 loading instructions to the outer two tracks of the newly formatted floppy disks.

G>DYNAGEN<CR>

Enter "DYNAGEN" followed by a carriage return. (You are still logged onto the Fujitsu on drive "G".) DYNAGEN will then sign on with the following menu and prompt:

DYNAGEN VERSION X.XX FOR DYNABYTE DOS 3.XX

GENERATE SYSTEM DISK

	TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER	
	CT)	TRANSFER SYSTEM USING ".COM" BOOT FILE	
	EX)	EXIT DYNAGEN	

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? **CT<CR>**

Enter "CT" followed by a carriage return. DYNAGEN will then ask you to identify the source drive:

(CT) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? G<CR>

Enter "G" followed by a carriage return to specify the Fujitsu as the source drive. DYNAGEN will then prompt for the destination drive:

WRITE SYSTEM TO DISK DRIVE (A-P) ? A<CR>

Enter "A" followed by a carriage return to specify the floppy drive as the destination drive. DYNAGEN will then prompt you to insert the floppy disk:

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE.

Insert one of the formatted floppy disks into the floppy drive, and close the door.

<CR>

Enter a carriage return to start the actual copying process. DYNAGEN then tells you it is working and asks you to wait:

PLEASE WAIT. WRITING SYSTEM TO FLOPPY DRIVE A.

When DYNAGEN has finished writing the loading instructions, it will prompt you to enter a carriage return:

PRESS <RETURN> TO DISPLAY MENU. <CR> Enter a carriage return. DYNAGEN will then return to its main menu:

DYNAGEN VERSION X.XX FOR DYNABYTE DOS 3.XX

GENERATE SYSTEM DISK

	TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER	
	CT)	TRANSFER SYSTEM USING ".COM" BOOT FILE	
	EX)	EXIT DYNAGEN	

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? CT<CR>

Enter "CT" followed by a carriage return to copy the DOS 3 loading instructions to the other formatted floppy disk. DYNAGEN will then ask you to identify the source drive:

(CT) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? G<CR>

Enter "G" followed by a carriage return to specify the Fujitsu as the source drive. DYNAGEN will then prompt for the destination drive:

WRITE SYSTEM TO DISK DRIVE (A-P) ? A<CR>

Enter "A" followed by a carriage return to specify the floppy drive as the destination drive. DYNAGEN will then prompt you to insert the floppy disk:

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE.

Remove the first floppy disk from the floppy drive, insert the remaining formatted floppy disk in its place, and close the door.

<CR>

Enter a carriage return to start the actual copying process. DYNAGEN then tells you it is working and asks you to wait:

PLEASE WAIT. WRITING SYSTEM TO FLOPPY DRIVE A.

When DYNAGEN has finished writing the loading instructions, it will prompt you to enter a carriage return:

PRESS <RETURN> TO DISPLAY MENU. <CR>

Enter a carriage return. DYNAGEN will then return to its main menu:

DYNAGEN VERSION X.XX FOR DYNABYTE DOS 3.XX

GENERATE SYSTEM DISK

```
| TR) TRANSFER SYSTEM FROM ONE DISK TO ANOTHER |
| CT) TRANSFER SYSTEM USING ".COM" BOOT FILE   |
| EX) EXIT DYNAGEN                             |
```

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? EX<CR>

Enter "EX" followed by a carriage return to exit DYNAGEN and return to the operating system.

Both of the formatted floppy disks are now "bootable"; that is, DOS 3 can now be booted from either of them.

Leave the new "bootable" floppy disk in the floppy drive.

Copy the DOS 3 files from the Fujitsu to the "bootable" floppy disks.

1. Log onto the floppy drive because the subsequent SUBMIT operations must be performed from drive A.

G>A:<CR>

Enter "A:" followed by a carriage return to log onto the floppy drive.

A>

The "A>" prompt signifies that DOS 3 is connected to logical drive "A", and is ready for additional commands.

2. Copy the Distribution Disk #1 files from the Fujitsu to the floppy disk that was left in the floppy drive.

A>G:SUBMIT G:COPY1 G A<CR>

Enter "G:SUBMIT G:COPY1 G A" followed by a carriage return. Enter this command exactly as shown; the spaces are very important.

"COPY1" is the name of a SUBMIT file stored with DOS 3 that contains file copying instructions for Distribution Disk #1. The appropriate files will automatically be copied from source drive "G" to destination drive "A".

When all the files have been copied, the following message will be displayed on the screen:

A>; DISTRIBUTION TRANSFER FOR DISK #1 COMPLETE

3. Remove the new copy of Distribution Disk #1 from the floppy drive and label it "Copy — DOS 3.XX Distribution Disk #1 of 2".
4. Insert the remaining "bootable" floppy disk into the floppy drive, and close the door.
5. Copy the Distribution Disk #2 files from the Fujitsu to the remaining floppy disk.

A>G:SUBMIT G:COPY2 G A<CR>

Enter "G:SUBMIT G:COPY2 G A" followed by a carriage return. Enter this command exactly as shown; the spaces are very important.

"COPY2" is the name of a SUBMIT file stored with DOS 3 that contains file transfer instructions for Distribution Disk #2. The appropriate files will automatically be copied from source drive "G" to destination drive "A".

When all the files have been copied, the following message will be displayed on the screen:

A>; DISTRIBUTION DISK #2 TRANSFER COMPLETE

6. Remove the new copy of Distribution Disk #2 from the floppy drive and label it "Copy -- DOS 3.XX Distribution Disk #2 of 2".

YOU NOW HAVE COPIES OF THE TWO DOS 3 DISTRIBUTION DISKS THAT WERE SHIPPED WITH YOUR COMPUTER.

Install DOS 3.

1. Log onto the Fujitsu.

A>G:<CR>

Enter "G:" followed by a carriage return to log onto the Fujitsu.

G>

The "G>" prompt signifies that DOS 3 is connected to logical drive "G", and is ready for additional commands.

2. Use DYNASYS to change the disk drive assignments on the 23 megabyte Fujitsu. (Skip to Step 3 if you have an 11 MB Fujitsu.)

G>DYNASYS<CR>

Enter "DYNASYS" followed by a carriage return. DYNASYS will sign-on with the following menu and prompt:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

MAIN MENU OPTIONS

AL)	ASSIGN / SETUP ALL PARAMETERS
SC)	SET CLEAR SCREEN SEQUENCE
CA)	CHARACTER I/O ASSIGNMENTS
CS)	CHARACTER I/O SETUP
DA)	DISK DRIVE ASSIGNMENTS
DS)	DISK DRIVE SETUP
CM)	CHAIN MODULE SETUP
DL)	DISK LOG / MESSAGE SETUP
LS)	LOAD / SAVE PARAMETER FILE
DC)	DISPLAY CURRENT CONFIGURATION
CD)	CREATE SYSTEM DISK
EK)	EXIT TO OPERATING SYSTEM

ENTER MENU ITEM ? DA<CR>

Enter "DA" followed by a carriage return to reassign the logical disk drives. DYNASYS will respond with the current disk drive assignments, and then prompt you to enter the letter of the drive you want to change:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK DRIVE ASSIGNMENTS

- F1 - F4 = FLOPPY DISK DRIVES
- CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
- CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
- FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
- MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
- MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = F1	E: = MINI1	I: =	M: =
B: = F2	F: = MINI2	J: =	N: =
C: = F3	G: = FUJ1	K: =	O: =
D: = F4	H: = FUJ2	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? A<CR>

Enter "A" followed by a carriage return to begin reassigning the logical drives, starting with logical drive "A". DYNASYS will then continue to prompt you for subsequent drive assignments until you respond to one of the prompts with nothing but a carriage return. Reassign the drives as shown here:

- DRIVE A: FUJ1<CR>
- DRIVE B: FUJ2<CR>
- DRIVE C: FUJ3<CR>
- DRIVE D: FUJ4<CR>
- DRIVE E: F1<CR>
- DRIVE F: F2<CR>
- DRIVE G: F3<CR>
- DRIVE H: F4<CR>
- DRIVE I: <CR>

Enter a carriage return after the "DRIVE I:" prompt. DYNASYS will stop prompting for logical drives, display the new disk drive assignments, and then prompt you to confirm the displayed assignments by entering a carriage return:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK DRIVE ASSIGNMENTS

F1 - F4 = FLOPPY DISK DRIVES
 CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
 CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
 FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
 MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
 MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = FUJ1	E: = F1	I: =	M: =
B: = FUJ2	F: = F2	J: =	N: =
C: = FUJ3	G: = F3	K: =	O: =
D: = FUJ4	H: = F4	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? <CR>

Enter a carriage return to confirm the displayed assignments. DYNASYS will then automatically prompt for the size of the Fujitsu drive you are configuring (11 or 23 megabytes):

WHICH SIZE FUJITSU DRIVE DO YOU HAVE:

0 = 11 MEGABYTE DRIVE
 1 = 23 MEGABYTE DRIVE

ENTER DRIVE SIZE ? 1<CR>

Enter "1" followed by a carriage return to indicate a 23 megabyte drive. DYNASYS will then return to its main menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

- | | |
|-----|-------------------------------|
| AL) | ASSIGN / SETUP ALL PARAMETERS |
| SC) | SET CLEAR SCREEN SEQUENCE |
| CA) | CHARACTER I/O ASSIGNMENTS |
| CS) | CHARACTER I/O SETUP |
| DA) | DISK DRIVE ASSIGNMENTS |
| DS) | DISK DRIVE SETUP |
| CM) | CHAIN MODULE SETUP |
| DL) | DISK LOG / MESSAGE SETUP |
| LS) | LOAD / SAVE PARAMETER FILE |
| DC) | DISPLAY CURRENT CONFIGURATION |
| CD) | CREATE SYSTEM DISK |
| EX) | EXIT TO OPERATING SYSTEM |

ENTER MENU ITEM ? DL<CR>

Enter "DL" followed by a carriage return to reassign drive "A" as the warm reboot drive. DYNASYS will respond with the current disk log assignments, and then prompt you to choose one of the following options:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK LOG / MESSAGE SETUP

- | | |
|-----|--|
| CL) | COLD BOOT LOG DRIVE = A |
| WR) | WARM REBOOT DRIVE = A |
| CM) | COLD BOOT MESSAGE FILE = NOT INSTALLED |
| DL) | DISPLAY LOAD MAP = YES |

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ? WR<CR>

Enter "WR" followed by a carriage return. DYNASYS will then prompt for the letter of the logical drive to be logged on during a warm boot. (A warm boot occurs whenever you enter a Control C, or whenever a program finishes running.)

(WR) WARM REBOOT DRIVE (A-P) ? A<CR>

Enter "A" followed by a carriage return to specify the Fujitsu as the warm reboot drive. DYNASYS will then

prompt you for the remaining two items on the menu. Enter a carriage return following each prompt to leave that assignment stand:

(CM) COLD BOOT MESSAGE FILE (FILENAME.TYP) ? <CR>

(DL) PRINT LOAD MAP DURING COLD BOOT (Y-YES/N-NO) ? <CR>

DYNASYS will display the new disk log assignments, and then prompt you to confirm the displayed assignments by entering a carriage return:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK LOG / MESSAGE SETUP

CL)	COLD BOOT LOG DRIVE = A
WR)	WARM REBOOT DRIVE = A
CM)	COLD BOOT MESSAGE FILE = NOT INSTALLED
DL)	DISPLAY LOAD MAP = YES

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ? <CR>

Enter a carriage return to confirm the displayed assignments. DYNASYS will then return to its main menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

AL)	ASSIGN / SETUP ALL PARAMETERS
SC)	SET CLEAR SCREEN SEQUENCE
CA)	CHARACTER I/O ASSIGNMENTS
CS)	CHARACTER I/O SETUP
DA)	DISK DRIVE ASSIGNMENTS
DS)	DISK DRIVE SETUP
CM)	CHAIN MODULE SETUP
DL)	DISK LOG / MESSAGE SETUP
LS)	LOAD / SAVE PARAMETER FILE
DC)	DISPLAY CURRENT CONFIGURATION
CD)	CREATE SYSTEM DISK
EK)	EXIT TO OPERATING SYSTEM

ENTER MENU ITEM?

- Use DYNASYS to change the disk drive assignments on the 11 megabyte Fujitsu. (Skip to Step 4 if you have a 23 MB Fujitsu.)

>DYNASYS<CR>

Enter "DYNASYS" followed by a carriage return. DYNASYS will sign-on with the following menu and prompt:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

MAIN MENU OPTIONS

- | | |
|-----|-------------------------------|
| AL) | ASSIGN / SETUP ALL PARAMETERS |
| SC) | SET CLEAR SCREEN SEQUENCE |
| CA) | CHARACTER I/O ASSIGNMENTS |
| CS) | CHARACTER I/O SETUP |
| DA) | DISK DRIVE ASSIGNMENTS |
| DS) | DISK DRIVE SETUP |
| CM) | CHAIN MODULE SETUP |
| DL) | DISK LOG / MESSAGE SETUP |
| LS) | LOAD / SAVE PARAMETER FILE |
| DC) | DISPLAY CURRENT CONFIGURATION |
| CD) | CREATE SYSTEM DISK |
| EX) | EXIT TO OPERATING SYSTEM |

ENTER MENU ITEM ? DA<CR>

Enter "DA" followed by a carriage return to reassign the logical disk drives. DYNASYS will respond with the current disk drive assignments, and then prompt you to enter the letter of the drive you want to change:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

DISK DRIVE ASSIGNMENTS

- F1 - F4 = FLOPPY DISK DRIVES
- CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
- CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
- FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
- MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
- MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = F1	E: = MINI1	I: =	M: =
B: = F2	F: = MINI2	J: =	N: =
C: = F3	G: = FUJ1	K: =	O: =
D: = F4	H: = FUJ2	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? A<CR>

Enter "A" followed by a carriage return to begin reassigning the logical drives, starting with logical drive "A". DYNASYS will then continue to prompt you for subsequent drive assignments until you respond to one of the prompts with nothing but a carriage return. Reassign the drives as shown here:

- DRIVE A: FUJ1<CR>
- DRIVE B: FUJ2<CR>
- DRIVE C: F1<CR>
- DRIVE D: F2<CR>
- DRIVE E: F3<CR>
- DRIVE F: F4<CR>
- DRIVE G: <CR>

Enter a carriage return after the "DRIVE G:" prompt. DYNASYS will stop prompting for logical drives, and display the new disk drive assignments. DYNASYS will then prompt you to enter the letter of another drive assignment you want to change:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

DISK DRIVE ASSIGNMENTS

- F1 - F4 = FLOPPY DISK DRIVES
- CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
- CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
- FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
- MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
- MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = FUJ1	E: = F3	I: =	M: =
B: = FUJ2	F: = F4	J: =	N: =
C: = F1	G: = FUJ1	K: =	O: =
D: = F2	H: = FUJ2	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? G<CR>

Enter "G" followed by a carriage return. DYNASYS will respond with the following prompt:

DRIVE G: <CR>

Enter a carriage return to clear the preset assignment from logical drive "G". DYNASYS will again display the new drive assignments, and then prompt you to enter the letter of another drive assignment you want to change:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK DRIVE ASSIGNMENTS

- F1 - F4 = FLOPPY DISK DRIVES
- CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
- CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
- FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
- MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
- MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = FUJ1	E: = F3	I: =	M: =
B: = FUJ2	F: = F4	J: =	N: =
C: = F1	G: =	K: =	O: =
D: = F2	H: = FUJ2	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? H<CR>

Enter "H" followed by a carriage return. DYNASYS will respond with the following prompt:

DRIVE H: <CR>

Enter a carriage return to clear the preset assignment from logical drive "H". DYNASYS will again display the new disk drive assignments, and then prompt you to confirm the displayed assignments by entering a carriage return:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK DRIVE ASSIGNMENTS

- F1 - F4 = FLOPPY DISK DRIVES
- CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
- CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
- FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
- MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
- MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = FUJ1	E: = F3	I: =	M: =
B: = FUJ2	F: = F4	J: =	N: =
C: = F1	G: =	K: =	O: =
D: = F2	H: =	L: =	P: =

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? <CR>

Enter a carriage return to confirm the displayed assignments. DYNASYS will then automatically prompt for the size of the Fujitsu drive you are configuring (11 or 23 megabytes):

WHICH SIZE FUJITSU DRIVE DO YOU HAVE:

- 0 = 11 MEGABYTE DRIVE
- 1 = 23 MEGABYTE DRIVE

ENTER DRIVE SIZE ? 0<CR>

Enter "0" followed by a carriage return to indicate an 11 megabyte drive. DYNASYS will then return to its main menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

- | | |
|-----|-------------------------------|
| AL) | ASSIGN / SETUP ALL PARAMETERS |
| SC) | SET CLEAR SCREEN SEQUENCE |
| CA) | CHARACTER I/O ASSIGNMENTS |
| CS) | CHARACTER I/O SETUP |
| DA) | DISK DRIVE ASSIGNMENTS |
| DS) | DISK DRIVE SETUP |
| CM) | CHAIN MODULE SETUP |
| DL) | DISK LOG / MESSAGE SETUP |
| LS) | LOAD / SAVE PARAMETER FILE |
| DC) | DISPLAY CURRENT CONFIGURATION |
| CD) | CREATE SYSTEM DISK |
| EX) | EXIT TO OPERATING SYSTEM |

ENTER MENU ITEM ? DL<CR>

Enter "DL" followed by a carriage return to reassign drive "A" as the warm reboot drive. DYNASYS will respond with the current disk log assignments, and then prompt you choose one of the following options:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK LOG / MESSAGE SETUP

CL)	COLD BOOT LOG DRIVE = A
WR)	WARM REBOOT DRIVE = A
CM)	COLD BOOT MESSAGE FILE = NOT INSTALLED
DL)	DISPLAY LOAD MAP = YES

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ? WR<CR>

Enter "WR" followed by a carriage return. DYNASYS will then prompt for the letter of the logical drive to logged on during a warm boot. (A warm boot occurs whenever you enter a Control C, or whenever a program finishes running.)

(WR) WARM REBOOT DRIVE (A-P) ? A<CR>

Enter "A" followed by a carriage return to specify the Fujitsu as the warm reboot drive. DYNASYS will then prompt you for the remaining two items on the menu. Enter a carriage return following each prompt to leave that assignment stand:

(CM) COLD BOOT MESSAGE FILE (FILENAME.TYP) ? <CR>

(DL) PRINT LOAD MAP DURING COLD BOOT (Y-YES/N-NO) ? <CR>

DYNASYS will display the new disk log assignments, and then prompt you to confirm the displayed assignments by entering a carriage return:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK LOG / MESSAGE SETUP

CL)	COLD BOOT LOG DRIVE = A
WR)	WARM REBOOT DRIVE = A
CM)	COLD BOOT MESSAGE FILE = NOT INSTALLED
DL)	DISPLAY LOAD MAP = YES

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ? <CR>

Enter a carriage return to confirm the displayed assignments. DYNASYS will then return to its main menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

AL)	ASSIGN / SETUP ALL PARAMETERS
SC)	SET CLEAR SCREEN SEQUENCE
CA)	CHARACTER I/O ASSIGNMENTS
CS)	CHARACTER I/O SETUP
DA)	DISK DRIVE ASSIGNMENTS
DS)	DISK DRIVE SETUP
CM)	CHAIN MODULE SETUP
DL)	DISK LOG / MESSAGE SETUP
LS)	LOAD / SAVE PARAMETER FILE
DC)	DISPLAY CURRENT CONFIGURATION
CD)	CREATE SYSTEM DISK
EX)	EXIT TO OPERATING SYSTEM

ENTER MENU ITEM?

4. Insert the new copy of DOS 3 Distribution Disk #1 into the floppy drive, and close the door.
5. Save the new system configuration onto the Fujitsu.

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

AL)	ASSIGN / SETUP ALL PARAMETERS
SC)	SET CLEAR SCREEN SEQUENCE
CA)	CHARACTER I/O ASSIGNMENTS
CS)	CHARACTER I/O SETUP
DA)	DISK DRIVE ASSIGNMENTS
DS)	DISK DRIVE SETUP
CM)	CHAIN MODULE SETUP
DL)	DISK LOG / MESSAGE SETUP
LS)	LOAD / SAVE PARAMETER FILE
DC)	DISPLAY CURRENT CONFIGURATION
CD)	CREATE SYSTEM DISK
EX)	EXIT TO OPERATING SYSTEM

ENTER MENU ITEM ? CD<CR> Enter "CD" followed by a carriage return to write the new system

configuration onto the Fujitsu. DYNASYS will respond with the CREATE SYSTEM DISK menu, and prompt you to choose one of two methods:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CREATE SYSTEM DISK

	WR)	WRITE SYSTEM TO DISK	
	TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER	

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? WR<CR>

Enter "WR" followed by a carriage return. DYNASYS will then ask you to identify the source drive:

(WR) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? G<CR>

Enter "G" followed by a carriage return to specify the Fujitsu as the source drive. (Remember, the Fujitsu will not be assigned to logical drive "A" until after DOS 3 has been rebooted.) DYNASYS will then prompt for the destination drive:

WRITE SYSTEM TO DISK DRIVE (A-P) ? G<CR>

Enter "G" followed by a carriage return to specify the Fujitsu as the destination drive. DYNASYS will then prompt you to place the proper disks into the proper drives:

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE. <CR>

Enter a carriage return to start the actual writing process. (NOTE: It is important that a "bootable" disk be in the floppy drive before entering a carriage return.) DYNASYS then tells you it is working and asks you to wait:

NOW WRITING SYSTEM, PLEASE WAIT.

When DYNASYS has finished writing the new system configuration, it will prompt you to enter a carriage return:

PRESS <RETURN> TO DISPLAY MENU. <CR>

Enter a carriage return. DYNASYS will return to the "CD" menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CREATE SYSTEM DISK

-
- | WR) WRITE SYSTEM TO DISK |
 - | TR) TRANSFER SYSTEM FROM ONE DISK TO ANOTHER |
-

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ?

- 6. Save the new system configuration onto the new copies of the DOS 3 distribution disks.
(Skip to Step 7 if you have the tape controller board.)

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CREATE SYSTEM DISK

-
- | WR) WRITE SYSTEM TO DISK |
 - | TR) TRANSFER SYSTEM FROM ONE DISK TO ANOTHER |
-

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? WR<CR>

Enter "WR" followed by a carriage return to write the new system configuration onto the copy you made of Distribution Disk #1. DYNASYS will then ask you to identify the source drive:

(WR) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? G<CR>

Enter "G" followed by a carriage return to specify the Fujitsu as the source drive. (Again, remember that the Fujitsu will not be assigned to logical drive "A" until after DOS 3 has been rebooted.) DYNASYS will then prompt for the destination drive:

WRITE SYSTEM TO DISK DRIVE (A-P) ? A<CR>

Enter "A" followed by a carriage return to specify the floppy drive as the destination drive. DYNASYS will then prompt you to place the proper disks into the proper drives:

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE. <CR>

Enter a carriage return to start the actual writing process to the copy of Distribution Disk #1 that is in the floppy drive. DYNASYS then tells you it is working and asks you to wait:

NOW WRITING SYSTEM, PLEASE WAIT.

When DYNASYS has finished writing the new system configuration, it will prompt you to enter a carriage return:

PRESS <RETURN> TO DISPLAY MENU. <CR>

Enter a carriage return. DYNASYS will return to the "CD" menu:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

CREATE SYSTEM DISK

	WR)	WRITE SYSTEM TO DISK	
	TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER	

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? WR<CR>

Enter "WR" followed by a carriage return to write the new system configuration onto the copy you made of Distribution Disk #2. DYNASYS will then ask you to identify the source drive:

(WR) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? G<CR>

Enter "G" followed by a carriage return to specify the Fujitsu as the source drive. DYNASYS will then prompt for the destination drive:

WRITE SYSTEM TO DISK DRIVE (A-P) ? A<CR>

Enter "A" followed by a carriage return to specify the floppy drive as

the destination drive. DYNASYS will then prompt you to place the proper disks into the proper drives:

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE.

Remove the copy of Distribution Disk #1 from the floppy drive, and insert the copy of Distribution Disk #2 in its place.

<CR>

Enter a carriage return to start the actual writing process. DYNASYS then tells you it is working and asks you to wait:

NOW WRITING SYSTEM, PLEASE WAIT.

When DYNASYS has finished writing the new system configuration, it will prompt you to enter a carriage return:

PRESS <RETURN> TO DISPLAY MENU. <CR>

Enter a carriage return. DYNASYS will return to the "CD" menu:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CREATE SYSTEM DISK

-
- | WR) WRITE SYSTEM TO DISK |
 - | TR) TRANSFER SYSTEM FROM ONE DISK TO ANOTHER |
-

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ?

7. Exit DYNASYS.

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CREATE SYSTEM DISK

-
- | WR) WRITE SYSTEM TO DISK |
 - | TR) TRANSFER SYSTEM FROM ONE DISK TO ANOTHER |
-

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU)? <CR>

Enter a carriage return. DYNASYS will then return to its main menu:

**DYNASYS VERSION X.XX -- FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

MAIN MENU OPTIONS

- | | |
|-----|-------------------------------|
| AL) | ASSIGN / SETUP ALL PARAMETERS |
| SC) | SET CLEAR SCREEN SEQUENCE |
| CA) | CHARACTER I/O ASSIGNMENTS |
| CS) | CHARACTER I/O SETUP |
| DA) | DISK DRIVE ASSIGNMENTS |
| DS) | DISK DRIVE SETUP |
| CM) | CHAIN MODULE SETUP |
| DL) | DISK LOG / MESSAGE SETUP |
| LS) | LOAD / SAVE PARAMETER FILE |
| DC) | DISPLAY CURRENT CONFIGURATION |
| CD) | CREATE SYSTEM DISK |
| EX) | EXIT TO OPERATING SYSTEM |

ENTER MENU ITEM? EX<CR>

Enter "EX" followed by a carriage return to exit DYNASYS and return to the operating system:

6

Reboot DOS 3.

If you have the tape controller board:

Make sure that no floppy disk is in the floppy disk drive. Press and release the reset button. The computer will now boot DOS 3 from the Fujitsu.

If you don't have the tape controller board:

Insert one of the new DOS 3 disks into the floppy drive, and close the door. Press and release the reset button. The computer will boot DOS 3 from the floppy drive, but with the new system configuration.

The computer is now configured as either an eight or a six drive computer.

If you have a 23 megabyte drive, the computer is now configured as an eight drive system. Drives A through D are on the Fujitsu, and Drives E through H are the floppy drives. This can be seen from the following list of disk drive assignments, as it would appear using DYNASTAT:

DISK DRIVE
ASSIGN
A:FUJ1
B:FUJ2
C:FUJ3
D:FUJ4
E:F1
F:F2
G:F3
H:F4

If you have an 11 megabyte drive, the computer is now configured as a six drive system. Drives A and B are on the Fujitsu, and Drives C through F are the floppy drives. This can be seen from the following list of disk drive assignments, as it would appear using DYNASTAT:

DISK DRIVE
ASSIGN
A:FUJ1
B:FUJ2
C:F1
D:F2
E:F3
F:F4
G:
H:

2.4 Models 5013, 5700, 5710

Winchester hard disk with cartridge tape drive
Dynabyte models 5013, 5700, 5710

When a 5013, 5700, or 5710 model computer arrives, neither the computer nor the Winchester disk contains any installed system software. DOS 3 is shipped on a tape cartridge. To get started, you must boot DOS 3 into the computer's memory from the tape.

The procedure below describes how to boot DOS 3 from the cartridge tape and copy the operating system to the hard disk on the system. When DOS 3 is on the hard disk, booting becomes a very fast and easy procedure. The procedure is the same regardless of the size of the disk on your system; however, some of the menu displays will vary depending on the size of the disk. The places where the actual menu differs will be noted.

METHOD 4 OVERVIEW

- Boot DOS 3 from the cartridge tape.
 - Format the hard disk.
 - Generate the system on the hard disk.
 - Boot DOS 3 from the hard disk.
 - Use DTIP to copy the whole cartridge tape to disk.
-

 Boot DOS 3 from the cartridge tape

1. Turn on the computer.
2. Insert cartridge tape.

Set the PROTECT switch on the tape cartridge to the SAFE position. The SAFE position prevents the data on the system tape from being accidentally erased. Insert the cartridge, label side up, all the way into the cartridge slot. The system will rewind the tape automatically.

3. Press and release the reset button.

The computer will execute the boot ROM. The following message appears on the screen:

```
DYNABYTE CPM/MM/0ASIS BOOT ROM
VERSION X.X
```

```
H-BOOT FROM HARD DISK
F-BOOT FROM FLOPPY
T-BOOT FROM TAPE
```

```
BOOT FROM ? T
```

4. Boot from tape.

Enter a T. The system rewinds the cassette tape, reads in the first file and then displays the following:

```
DYNABYTE TAPE BOOT
VERSION X.X
```

```
TAPE BOOT OPTIONS
```

FUJ)	FORMAT FUJITSU WINCHESTER
MIC)	FORMAT MICROPOLIS WINCHESTER
CMD)	FORMAT CMD
MIN)	FORMAT MINI WINCHESTER
HDS)	HDSYSGEN HARD DISK

```
ENTER MENU ITEM ? MIN<CR>
```

Enter "MIN" or the mnemonic that describes your hard disk. For instance, if you have a Fujitsu hard disk, then type "FUJ" followed by a carriage return.

Format the hard disk.

- 1. Format the disk (the example shows how to format the Mini Winchester disk). Refer to Section 5 if you need assistance in using the other hard disk format programs.

Enter MIN<CR>. The screen displays the menu.

***** DYNABYTE 5.25" HARD DISK FORMAT VERSION 3.XX FOR TAPE BOOT *****

- CO) CHECK ONLY
- FC) FORMAT AND CHECK
- EX) RETURN TO TAPE BOOT MENU

YOUR SELECTION: FC<CR>

Enter FC<CR> to FORMAT and CHECK the disk.

A series of dots will appear on the screen while the disk is being formatted. When the formatting operation is complete, a count of the number of bad tracks is displayed.

BEGIN FORMAT-ENTER ESC TO ABORT

.....
.....
.....
.....

FORMAT COMPLETE-00H BAD TRACKS WERE FOUND

Generate DOS 3 on the hard disk.

1. Configure the disk.

The configuration options are displayed in the CONFIGURATION OPTIONS menu. The configuration options will vary with the size of the hard disk being used.

CONFIGURATION OPTIONS

6MB HARD DISK DRIVE

- A) 1 DRIVE | 4.9 MB | 1024 DIRECTORY ENTRIES
B) 2 DRIVES | 2.48 MB | 512 DIRECTORY ENTRIES

SELECT OPTION OR <RETURN> FOR DEFAULT (OPTION B): B<CR>

Select option B by typing "B" or by simply pressing a carriage return. This choice does not refer to the number of disks or spindles on the system. TWO DRIVES indicates the disk is to be configured as two logical drives. The BAD TRACK TABLE shows which tracks are to be marked as bad by the operator. This display will vary with the size of the hard disk being used.

BAD TRACK TABLE				
1)	2)	3)	4)	5)
6)	7)	8)	9)	10)
11)	12)	13)	14)	15)
16)	17)	18)	19)	20)
21)	22)	23)	24)	25)
26)	27)	28)	29)	30)
31)	32)	33)	34)	35)
36)	37)	38)	39)	40)
41)	42)	43)	44)	45)
46)	47)	48)	49)	50)
51)	52)	53)	54)	55)
56)	57)	58)	59)	60)

"T*****" (LOGICAL BAD TRACK NUMBER)
 "H*,C****" (HEAD, CYLINDER NUMBER)

ENTER ONE OF THE ABOVE OPTIONS OR <RETURN> TO ACCEPT: <CR>

Normally, enter a carriage return to accept the system's substitute track assignments for bad tracks. If there is a technical reason to override the system assignments, enter the number of the item to be modified. The system will then display the Tape Boot Options menu:

DYNABYTE TAPE BOOT
 VERSION 3.X

TAPE BOOT OPTIONS

FUJ)	FORMAT FUJITSU WINCHESTER
MIC)	FORMAT MICROPOLIS WINCHESTER
CMD)	FORMAT CMD
MIN)	FORMAT MINI WINCHESTER
HDS)	HDSYSGEN HARD DISK

ENTER MENU ITEM ? HDS<CR>

2. SYSGEN the hard disk.

Enter an HDS followed by a carriage return to start the hard disk system generation. The system displays the following menu:

***** HARD DISK SYSTEM GENERATION FROM TAPE - VERSION 3.XX *****

```
| CP) WRITE CP/M SYSTEM TO FUJITSU HARD DISK |
| CM) WRITE CP/M SYSTEM TO MICROPOLIS HARD DISK |
| CC) WRITE CP/M SYSTEM TO CMD FIXED DISK |
| CW) WRITE CP/M SYSTEM TO MINIWINI HARD DISK |
|
| MF) WRITE MP/M SYSTEM TO FUJITSU HARD DISK |
| MM) WRITE MP/M SYSTEM TO MICROPOLIS HARD DISK |
| MC) WRITE MP/M SYSTEM TO CMD FIXED DISK |
| MW) WRITE MP/M SYSTEM TO MINIWINI HARD DISK |
|
| EX) EXIT TO OPERATING SYSTEM |
```

YOUR SELECTION ? CW<CR>

Enter a CW (or the correct mnemonic for your hard disk) to write CP/M to the Mini Winchester hard disk.

PLEASE WAIT. WRITING SYSTEM TO MINIWINI DRIVE.

The system reads the CP/M operating system from the tape onto the disk and will prompt the operator when the system has been completely written to disk.

PRESS <RETURN> TO DISPLAY MENU. <CR>

Enter <CR> to display the system generation menu again.

Boot DOS 3 from the hard disk.

1. Press and release the reset button to boot the system.

The system will display the Dynabyte
Boot ROM menu.

**DYNABYTE CPM/MPM/OASIS BOOT ROM
VERSION X.X**

**H-BOOT FROM HARD DISK
F-BOOT FROM FLOPPY
T-BOOT FROM TAPE**

BOOT FROM ? H

Press H to boot CP/M from the hard
disk. The system will display the A>
prompt indicating CP/M is waiting for
instructions.

Use DTIP to copy the tape to disk.

1. Use DTIP to copy the remaining files from the cartridge tape.

A>DTIP<CR>

Enter DTIP<CR> to run the DYNABYTE
TAPE INTERCHANGE PROGRAM. The system
displays the following menu:

CODE:	ACTION:
I	INITIALIZE TAPE
B	DISK TO TAPE BACKUP
R	TAPE TO DISK RESTORATION
A	DISK TO TAPE APPEND
D	TAPE DIRECTORY
V	FILE VERIFICATION
C	TAPE TO TAPE COPY
T	RETENTION TAPE
(ESC)	ESCAPE TO MONITOR

ACTION DESIRED: R<CR>

Enter R to copy the tape to the disk.
Enter a <CR> in response to the SAVE
SET inquiry. Enter a *.* for the file
entry. This copies all of the files
from the tape to the disk.

TAPE TO DISK RESTORATION

ENTER SAVE SET CODE (CR FOR DEFAULT): <CR>

FILE NAME (CR = DONE): *.*

SEARCH FROM START OF DATA (Y/N) ? Y

IGNORE SOURCE DEVICE CODE AS WRITTEN ON TAPE (Y/N) ? Y

Enter a "Y" (no carriage return is
needed) for both the SEARCH FROM START
OF DATA query and the IGNORE SOURCE
DEVICE CODE AS WRITTEN ON TAPE query.

The system will list the file names as
it copies them as shown below:

COPYING:

NAME	TYPE	DRIVE	USER	SS
DYNABYTE.TAP		A	0	00
LOADER .TAP		A	0	00
WFORMAT .TAP		A	0	00
HFORMAT .TAP		A	0	00
...				
...				
...				
CPMLDR .TAP		A	0	00

FILE NAME (CR = DONE): <CR>

Enter a carriage return to the FILE NAME inquiry.

DYNABYTE TAPE INTERCHANGE PROGRAM - VERSION 3.XX

CODE:	ACTION:
I	INITIALIZE TAPE
B	DISK TO TAPE BACKUP
R	TAPE TO DISK RESTORATION
A	DISK TO TAPE APPEND
D	TAPE DIRECTORY
V	FILE VERIFICATION
C	TAPE TO TAPE COPY
T	RETENTION TAPE
(ESC)	ESCAPE TO MONITOR

ACTION DESIRED: <ESC>

Enter the ESC key to exit the DTIP program.

3.0 SYSTEM GENERATION AND CONFIGURATION

3.1 DYNASYS

The DYNASYS configuration program is used to create what is referred to as a system disk. A system disk is used to load, or boot, the DOS 3 operating system when the computer is first turned on or reset. All the information your computer needs to load the operating system into memory is contained on the system disk. Through the DYNASYS program, you are given the opportunity to describe the parameters of your system's configuration.

The computer boots the DOS 3 operating system by reading selected portions of a system disk into the computer's memory. The boot information is contained in the first outermost track on a hard disk or in the outer two tracks on a floppy disk, and in a series of files from the data area of the system disk. The outer boot track(s) and the data areas are configured with the appropriate information by the DYNASYS configuration program.

DYNASYS is a menu-driven program. You simply answer questions about the devices connected to the computer and DYNASYS constructs an operating system using only the appropriate modules. Thus, DOS 3 can be as extensive or as streamlined as you want. You may choose to use a very basic operating system to save memory space. At any time, you can change or remove any of the parameters that set up your DOS 3 operating system by entering DYNASYS and using the options displayed in the main menu. You simply enter the two-letter code that represents the selected menu option and answer the subsequent questions. Any DYNASYS assignments you make, however, are not operative until you run the CD option, creating a new system disk, and reboot your computer from that disk. Any component of a new system configuration that is established with DYNASYS is not reflected until your computer is booted under that system.

DYNASYS may be used to create any number of system disks, each configured for a particular application. It is important to remember, however, that DYNASYS constructs a system disk for a specific hardware configuration. A new hardware configuration may require the creation of a new system disk.

When the DYNASYS program is first invoked by typing DYNASYS and a carriage return, the main menu is displayed:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3
CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

	AL)	ASSIGN / SETUP ALL PARAMETERS	
	SC)	SET CLEAR SCREEN SEQUENCE	
	CA)	CHARACTER I/O ASSIGNMENTS	
	CS)	CHARACTER I/O SETUP	
	DA)	DISK DRIVE ASSIGNMENTS	
	DS)	DISK DRIVE SETUP	
	CM)	CHAIN MODULE SETUP	
	DL)	DISK LOG / MESSAGE SETUP	
	LS)	LOAD / SAVE PARAMETER FILE	
	DC)	DISPLAY CURRENT CONFIGURATION	
	CD)	CREATE SYSTEM DISK	
	EX)	EXIT TO OPERATING SYSTEM	

ENTER MENU ITEM?

DYNASYS is now prompting you to select one of the displayed menu options. To execute a menu option, enter in capital letters the two-letter combination of the option you want and a carriage return. You must use capital letters in DYNASYS! Once you are in a menu branch, you will be prompted to set values to various system parameters.

Study carefully the function of each option before running DYNASYS. An incorrect configuration could prevent the new system disk from booting. Each of the menu items will be discussed in detail later in this chapter. But first, the function of each option is briefly described.

AL) Assign / Setup All Parameter

The AL option successively invokes each of the other menu options, starting with the SC option and progressing to the CD option. AL should be used when you are configuring a system for the first time, as it will automatically guide you through the configuration process.

SC) Set Clear Screen Sequence

The SC option allows you to set a clear screen sequence to be used during the DYNASYS process. Setting this option causes the screen display to roll down from the top instead of up from the bottom. The names of some common terminals are displayed to make the selection of the proper sequence easy. Or, you can manually enter each character in the sequence.

CA) Character I/O Assignment

The CA option allows you to assign the physical ports to the CONSOLE and LIST logical devices. The option displays any default or previously established

values. Physical ports may be assigned to as many as four CONSOLE and four LIST logical devices.

CS) Character I/O Setup

The CS option is used to set up parameters for the character I/O devices. Options include baud rates, stop bits, password, word length and parity.

DA) Disk Drive Assignment

The DA option allows you to assign each of the 16 logical disk drives connected to the system. You may assign any floppy drive (5.25" or 8"), any Fujitsu Winchester drive (11 or 23 megabytes), any Micropolis Winchester drive (9, 27, or 45 megabytes), or any Mini Winchester drive (6, 10, 12, 16, or 19 megabytes). Default or assigned drives are displayed.

DS) Disk Drive Setup

This option is executed only if a Fujitsu Winchester hard disk drive was specified in the previous disk drive assignments (DA) option. The DS option will simply ask which size Fujitsu drive you are configuring: 11 or 23 megabytes. If you have not assigned a Fujitsu drive in the disk assignments above, then this option will have no effect.

CM) Chain Module Setup

The CM option allows you to designate a command line of up to 128 characters to be automatically executed during every cold or warm boot. The CM option will display the current status of the Chain Module -- whether or not it is presently installed -- and the command line to be executed if it is installed. You can then either install or not install the option for both cold and warm boot.

DL) Disk Log / Message Setup

The DL option allows you to specify which disk drive is to be used for both cold and warm boots. This option also allows you to install a file to be displayed during cold boot. The Load Map Display can also be turned off or on.

LS) Load / Save Parameter File

The LS option allows you to save, as a file on the disk, all of the parameters you have specified in the current DYNASYS program. Alternately, LS allows you to load a previously created disk file from which the parameters for the current DYNASYS program are taken. The LS option also allows you to clear all parameters to empty values.

DC) Display Current Configuration

On a single screen, 80 by 24 characters in size, the DC option summarizes all of the DYNASYS parameters and their current values. This allows you to verify that the parameters you have entered during the current DYNASYS program accurately reflect your wishes. You still have the opportunity to change any values before you exit DYNASYS.

CD) Create System Disk

The CD option creates a system disk in one of two ways. You can direct it to create a system disk which will store the parameters you've just specified during the current DYNASYS program. Or, you can copy the boot portion, including all of its DYNASYS parameters, from one disk to another. The new system disk can then be used to boot DOS 3 into the computer with the parameters set by another DYNASYS program.

EX) Exit to Operating System

When you are finished with the DYNASYS operation, use the EX option to return to the operating system level. If you have changed any parameters without using either the CD or LS option to save them, you will be asked if you intentionally want to exit without saving the parameters.

Quick Overview

The following table gives you an overview of the DYNASYS parameters and their default values. The DC option produces a table in this format which summarizes all current DYNASYS values.

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3
CP/M 2.2 SYSTEM REGENERATION UTILITY

***** DYNABYTE DOS 3 STATUS UTILITY *****

CHARACTER I/O		DISK DRIVE	MODULES	BAUD RATES AND
CONSOLE	LIST	ASSIGN	INCLUDED	INSTALLATION MESSAGES
0=CPU2	0=CPU1	A:=F1	1=CPUIO .SPR	CPU1: 9600 BAUD / 2 SB
1=	1=	B:=F2	2=FLOPPY .SPR	CPU2: 9600 BAUD / 2 SB
2=	2=	C:=F3	3=MINIWINI.SPR	
3=	3=	D:=F4	4=FUJITSU .SPR	
		E:=MINI1	5=	
READER	PUNCH	F:=MINI2	6=	
		G:=FUJ1	7=	COLD LOGON: A DRIVE
0=CPU1	0=CPU1	H:=FUJ2	8=	WARM LOGON: A DRIVE
1=	1=	I:=	9=	
2=	2=	J:=	A=	SYSTEM MEMORY SIZE: 57K
3=	3=	K:=		MODEM PASSWORD:
		L:=		
MODEM		M:=		READER WORD LENGTH: 7
		N:=		COLD MSG: NOT INSTALLED
TYPE: DC HAYES		O:=		
300 BAUD 1 ST BIT		P:=		COLD CHAIN: NOT INSTALLED
WRD LEN=8 PAR=NONE				WARM CHAIN: NOT INSTALLED

Next, each of the following menu options is discussed in detail.

MAIN MENU OPTIONS

AL)	ASSIGN / SETUP ALL PARAMETERS
SC)	SET CLEAR SCREEN SEQUENCE
CA)	CHARACTER I/O ASSIGNMENTS
CS)	CHARACTER I/O SETUP
DS)	DISK DRIVE SETUP
CM)	CHAIN MODULE SETUP
DL)	DISK LOG / MESSAGE SETUP
DA)	DISK DRIVE ASSIGNMENTS
LS)	LOAD / SAVE PARAMETER FILE
DC)	DISPLAY CURRENT CONFIGURATION
CD)	CREATE SYSTEM DISK
EX)	EXIT TO OPERATING SYSTEM

ENTER MENU ITEM ?

3.1.1 The AL Option: Assign / Setup All Parameters

Typing AL in response to the main menu query, ENTER MENU ITEM?, successively invokes each of the other menu options (except EX which terminates DYNASYS). The SC (Set Clear screen sequence) option is called first, the CA option second, and so on until CD is called.

AL should be used when you are configuring a system for the first time. It prompts you for responses to each menu item without your having to return to the main menu after completing each option. By automatically guiding you through the steps, AL also ensures that you don't overlook an important part of the configuration process.

If you are using DYNASYS to reconfigure several parameters on an existing system disk, you may prefer not to use the AL option. It may be more efficient for you to select only those options affecting parameters you wish to modify.

If the AL option is not used, you are returned to the main menu display after completing each option and given an opportunity to select another until exiting DYNASYS.

3.1.2 The SC Option: Set Clear Screen Sequence

Setting the SC option causes the screen display to roll down from the top instead of up from the bottom during the DYNASYS process. This enhances the appearance and the speed with which the screen is displayed while not affecting the performance of the rest of the system. However, for you to take advantage of this option your console must have the internal capability to receive a clear screen sequence. Consult your console's manual to determine if your console has this capability.

The SC option will display the following menu of common terminals:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3

CP/M 2.2 SYSTEM REGENERATION UTILITY

- 0 - DYNABYTE 5022
- 1 - SOROC IQ-120 OR IQ-140
- 2 - INFOTON I-100
- 3 - TELEVIDEO 912 OR 920
- 4 - BEEHIVE
- 5 - HEATH H-19
- 6 - ADDS REGENT
- 7 - ZENITEC ZEPHYR
- 8 - HAZELTINE 1500
- 9 - NONE OF THE ABOVE

ENTER TERMINAL TYPE TO BE USED (0 - 9) ?

If your console brand is listed in options 0 - 8 and you want to take advantage of this option, then enter the appropriate number and the CLEAR SCREEN sequence will be set up for you automatically. If you do not want the CLEAR SCREEN sequence, type a Carriage Return. If you do want the CLEAR SCREEN SEQUENCE and your particular console device is NOT listed, then enter option 9. Consult your terminal manual for information on its clear screen capability. The following prompt will be displayed:

DOES YOUR TERMINAL HAVE A CLEAR SCREEN SEQUENCE (Y=YES,N=NO) ?

If your terminal does not have a clear screen capability, then answer the question N for NO. A negative response will put you at the next main menu option (CA) if the AL option is in effect. If AL was not specified earlier in the DYNASYS process and a negative response was entered, you will be returned to the main menu display.

If your terminal does have a clear screen capability which you would like implemented, look in your terminal's manual to find what the character sequence is in HEX notation. Then answer the question Y for YES and the following prompt will be displayed:

HOW MANY CHARACTERS MAKE UP THE CLEAR SCREEN SEQUENCE ?

You may now enter a number from 1 to 3 that represents the number of characters that are to be sent to the console device to perform a CLEAR SCREEN function. The following prompt will appear:

FIRST NUMBER IN CLEAR SCREEN SEQUENCE (IN HEX) ?

You may now enter the first character in the sequence, in hexadecimal form, as specified in your console manual. You will similarly be prompted for the second and third characters if you have indicated that those characters exist.

3.1.3 The CA Option: Character I/O Assignments

The CA option will allow you to set the physical ports on a Dynabyte computer to any CONSOLE, PRINTER (alias LIST), READER or PUNCH logical device. Up to four ports may be assigned to each of the four types of character I/O devices, but only one CONSOLE, PRINTER, READER or PUNCH may be active at a time. DOS 3 provides internal utilities which allow you to easily transfer control among any of the assigned consoles or printers.

You may also assign any physical port that your system supports to any logical device. We do recommend, however, that you retain the C0 = CPU2 default assignment since the LOAD MAP DISPLAY is programmed for the CPU2 port. We recommend that before starting the DYNASYS program, you plan and keep records on your port assignments.

The menu provided by the CA option displays any default or previously established values. Following is the menu showing the default assignments.

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CHARACTER I/O DEVICE ASSIGNMENTS

CPU1 - CPU2 = CPU SERIAL PORTS CPUP = CPU PARALLEL PORT
 OCT1 - OCT16 = OCTAPORT PORTS MOD1 - MOD8 = AUTO-ANSWER MODEM
 USR1 - USR8 = USER I/O DRIVERS

CONSOLE		LIST		READER		PUNCH	
C0)	0 = CPU2	L0)	0 = CPU1	R0)	0 = CPU1	P0)	0 = CPU1
C1)	1 =	L1)	1 =	R1)	1 =	P1)	1 =
C2)	2 =	L2)	2 =	R2)	2 =	P2)	2 =
C3)	3 =	L3)	3 =	R3)	3 =	P3)	3 =

ENTER MENU ITEM TO CHANGE (<RETURN> TO LEAVE AS IS)

Ports CPU1, CPU2, and CPUP are supported by even the smallest system, as they reside on the CPU card in the system. To use any of the other ports requires that the appropriate board be plugged into your system.

Ports OCT1 through OCT4 require one Dynabyte 4-port serial I/O quadraport board. Ports OCT1 through OCT8 require an 8-port serial I/O Octaport board. A second Octaport board provides eight more ports, OCT9 through OCT16.

Ports USR1 through USR8 may be used to configure a board supplied by another manufacturer or to modify the protocol used with any Dynabyte port. Each USR port on the distribution disk functions like its corresponding CPU port (i.e., USR1 = CPU1). See the discussion on USER I/O DRIVERS for more details.

Ports MOD1 through MOD8 support two types of modem boards -- the DC HAYES and PMMI. One modem port is supported by one modem board -- the maximum that DOS 3 can support. Of the eight modem ports provided, you may assign only ONE of them to your system. This flexibility is provided to allow hardware compatibility with a system that also runs MP/M. See the discussion on modems in Section 8.4 for more information on these auto-answer modems.

Any port can be assigned to any device, as long as the assigned ports are supported by the installation of the appropriate boards. Ports may be assigned in any order and you do not have to assign every available port if you don't want to. For instance, you may choose to use CPU serial port #2 (CPU2) and to ignore CPU serial port #1 (CPU1). The system will then not recognize any input or output from the unused port.

To make the first device assignment, type the appropriate two-letter code. Note in the following interaction that you are prompted for further assignments within a logical device category (CONSOLE, etc.) unless no entry is made and a carriage return is typed. At that point you are prompted to assign devices for the next logical device category. The last carriage return will redisplay the CA menu with its current assignments, allowing you the opportunity to change the assignments or exit the CA option.

ENTER MENU ITEM TO CHANGE (<RETURN> TO LEAVE AS IS) ? C1<CR>

C1) 1 = ? OCT3<CR>

C2) 2 = ? <CR>

ENTER DEVICE NAME FOR NEXT GROUP.

L0) 0 = ? OCT4<CR>

L1) 1 = ? <CR>

ENTER DEVICE NAME FOR NEXT GROUP.

R0) 0 = ? <CR>

ENTER DEVICE NAME FOR NEXT GROUP.

P0) 0 = ? <CR>

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CHARACTER I/O DEVICE ASSIGNMENTS

CPU1 - CPU2 = CPU SERIAL PORTS

CPUP = CPU PARALLEL PORT

OCT1 - OCT16 = OCTAPORT PORTS

MOD1 - MOD8 = AUTO-ANSWER MODEM

USR1 - USR8 = USER I/O DRIVERS

CONSOLE	LIST	READER	PUNCH
C0) 0 = CPU2	L0) 0 = OCT4	R0) 0 = CPU1	P0) 0 = CPU1
C1) 1 = OCT3	L1) 1 =	R1) 1 =	P1) 1 =
C2) 2 =	L2) 2 =	R2) 2 =	P2) 2 =
C3) 3 =	L3) 3 =	R3) 3 =	P3) 3 =

ENTER MENU ITEM TO CHANGE (<RETURN> TO LEAVE AS IS)

Note that the new menu display reflects the assignments that were just made. A final carriage return either returns you to the DYNASYS main menu, or if the AL option is in effect, moves you to the next option -- CS (Character I/O Setup).

3.1.4 The CS Option: Character I/O Setup

The CS option is used to set up parameters for two character I/O modules: CPUIO and MODEM. Options for the CPUIO module are baud rates and stop bits. Options for the MODEM module include: type (PMMI or DC HAYES), baud rate, stop bits, parity, word length and password.

The CS menu displaying the default values is shown below:

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CHARACTER I/O SETUP

B1)	CPU1 BAUD RATE	=	9600		MT)	MODEM TYPE	=	DC HAYES	
B2)	CPU2 BAUD RATE	=	9600		MB)	MODEM BAUD RATE	=	300	
S1)	CPU1 STOP BITS	=	2		MS)	MODEM STOP BITS	=	1	
S2)	CPU2 STOP BITS	=	2		MP)	MODEM PARITY	=	NONE	
RW)	RDR WORD LENGTH	=	7		MW)	MODEM WORD LENGTH	=	8	
					PW)	MODEM PASSWORD	=		

ENTER MENU ITEM TO CHANGE (<RETURN> TO LEAVE AS IS) ?

Note that in the following sequence, DYNASYS displays which values are available for each option.

ENTER MENU ITEM TO CHANGE (<RETURN> TO LEAVE AS IS) ? B1<CR>

BAUD RATES = 110 150 300 1200 2400 4800 9600 19200 38400 76800

B1) ENTER CPU1 BAUD RATE (SEE TABLE ABOVE) ? 300<CR>

BAUD RATES = 110 150 300 1200 2400 4800 9600 19200 38400 76800

B2) ENTER CPU2 BAUD RATE (SEE TABLE ABOVE) ? 9600<CR>

S1) ENTER CPU1 STOP BITS (1 OR 2) ? <CR>

S2) ENTER CPU2 STOP BITS (1 OR 2) ? <CR>

A carriage return entered in response to the S2 prompt returns you to the CS menu. This menu addresses three logical sections: the CPU1 and CPU2 ports; the reader word length; and modem characteristics. A carriage return entered to the last option in a logical section returns you to the CS menu. To continue in another logical section, just enter the appropriate two-letter combination, as usual.

RW) ENTER READER WORD LENGTH (7 OR 8) ? 7<CR>

MT) ENTER MODEM TYPE (DC HAYES OR PMMI) ? PMMI<CR>

PMMI BAUD RATES = 110 150 300 600

MB) ENTER MODEM BAUD RATE (SEE TABLE ABOVE) ? 600<CR>

MS) ENTER MODEM STOP BITS (1 OR 2) ? 1<CR>

MP) ENTER MODEM PARITY (ODD,EVEN,NONE) ? NONE<CR>

MW) ENTER MODEM WORD LENGTH (5,6,7,8) ? 8<CR>

PW) ENTER MODEM PASSWORD (1-8 CHARACTERS) ? 1234567890<CR>

Upon entering the value of the final CS parameter, the menu will be redisplayed, reflecting the currently assigned values:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

CHARACTER I/O SETUP

B1)	CPU1 BAUD RATE	= 300	MT)	MODEM TYPE	= PMMI
B2)	CPU2 BAUD RATE	= 9600	MB)	MODEM BAUD RATE	= 600
S1)	CPU1 STOP BITS	= 2	MS)	MODEM STOP BITS	= 1
S2)	CPU2 STOP BITS	= 2	MP)	MODEM PARITY	= NONE
RW)	RDR WORD LENGTH	= 7	MW)	MODEM WORD LENGTH	= 8
			PW)	MODEM PASSWORD	= 12345678

ENTER MENU ITEM TO CHANGE (<RETURN> TO LEAVE AS IS) ?

The right side of the menu (options MT - PW) is relevant only if a Modem board is installed on your system. See the discussion on MODEMS and read your modem manual before you try to install a modem board. Note that the modem password can only be eight characters long. The excess characters, digits 9 and 0, were dropped by DYNASYS. We recommend using 1 stop bit with a Modem.

We recommend that you always use 2 stop bits for CPU1 and CPU2. If the receiving terminal is configured for only 1 stop bit, then using 2 will still permit communication with the device. If however, you assign 1 and a device is configured for 2, then you will not be able to communicate. Therefore, you will typically just type a carriage return in response to the stop bit query.

Option RW (Read Word Length) should remain at its initial setting of 7 for device channels; RW should be set at 8 only if a Reader or Punch is to be used for communication with other computers.

3.1.5 The DA Option: Disk Drive Assignments

The DA option allows you to assign each of the 16 logical disk drives that may be connected to the system. Depending on your system, you may choose from any floppy disk drive (5.25" or 8" double-sided); any Winchester hard disk drive (11, 23 or 45 megabytes); any Cartridge Module (CMD) Disk drive (32, 64 or 96 megabytes); or Mini Winchester (5.25") hard disk drive (6, 10, 12, 16, or 19 megabytes). Default or assigned drives are displayed.

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

DISK DRIVE ASSIGNMENTS

F1 - F4 = FLOPPY DISK DRIVES
CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = F1	E: = MINI1	I: =	M: =
B: = F2	F: = MINI2	J: =	N: =
C: = F3	G: = FUJ1	K: =	O: =
D: = F4	H: = FUJ2	L: =	P: =

DRIVE TO CHANGE A - P (<RETURN> TO LEAVE AS IS) ?

To assign a physical disk to a logical drive, type in response to the above prompt the letter of the drive you want to assign. DYNASYS will then continue to prompt you for further drive assignments until you type only a carriage return. You may enter any of the following mnemonics that pertain to your system:

F1	CMR1	CMF3	CMF7	FUJ1	FUJ5	MW1	MW5	MINI4	MINI8
F2	CMR2	CMF4	CMF8	FUJ2	FUJ6	MW2	MINI1	MINI5	
F3	CMF1	CMF5	CMF9	FUJ3	FUJ7	MW3	MINI2	MINI6	
F4	CMF2	CMF6	CMF10	FUJ4	FUJ8	MW4	MINI3	MINI7	

3.1.5.1 Cartridge Module Drives

The drives for the CMD hard disk drives are configured on a platter basis. Since each platter surface contains 13 megabytes of formatted usable space and the maximum drive size DOS 3 can handle is approximately 8.3 megabytes, each platter surface is considered to be two logical drives. One logical drive consists of the outer disk tracks and the other consists of the inner tracks. Each logical drive is exactly the same size — 6.5 megabytes — able to store up to 512 directory entries. The smallest CMD unit consists of one removable (CMR) platter and one fixed (CMF) platter, yielding a total of 4 logical devices. The largest CMD unit may contain up to 5 fixed platters in addition to the standard removable platter. The logical drives allowed for each of the 3 CMD units are:

32 MB: CMR1 - CMR2
 CMP1 - CMP2

64 MB: CMR1 - CMR2
 CMP1 - CMP6

96 MB: CMR1 - CMR2
 CMP1 - CMP10

Note that each CMD unit has a removable platter (CMR). There is always one removable platter housed in a plastic case that may be used for back up of the fixed platter(s). The 64 and 96 megabyte drives simply add more fixed platters to the drive.

After formatting, each logical drive has approximately 6.5 megabytes of usable space. Thus, the 32 MB system actually yields approximately 26 MB; the 64 MB system yields about 52 MB; and the 96 MB system yields close to 78 MB.

See the discussion on CMD disk drives in Section 5.2 for more information on configuring the CMD unit under DOS 3.

3.1.5.2 Floppy Drives

F1 through F4 are the four floppy disk drives that can be connected to your system. F1 will always be the floppy disk on which you boot the system. If you have one, F2 will always be the floppy drive next to F1. F3 and F4 will be the second set of drives if your system has them. If booting from a hard disk, F1 will be the 8" floppy drive. If there isn't an 8" floppy drive on the system, then F1 will be the 5.25" floppy drive. See Section 5.1 for more information on configuring floppy drives.

3.1.5.3 Fujitsu Winchester Drives

FUJ1 through FUJ8 are the maximum number of disk drive assignments possible with the Fujitsu Winchester hard disk. The Fujitsu Winchester is available in two sizes -- 11 megabytes and 23 megabytes. The number of disk drives available to your Fujitsu unit will depend on which size Fujitsu you have and how you formatted the drive during an earlier FUJFMT process. When formatting your drive with FUJFMT, you were asked which one of three configurations you wanted for your Fujitsu drive. These configurations assign the number of megabytes to each logical drive. Read Section 5.4.2 for more information on formatting the Fujitsu drive.

The following table summarizes the available logical drives for each size Fujitsu and configuration. You must not assign more logical drives than are available to you under the size of your drive and the configuration chosen. Do not assign any FUJ mnemonics that will not physically be supported by your system after it is booted.

11 MEGABYTE FUJITSU

Configuration A	Configuration B	Configuration C
FUJ1 - 8.3 MB	FUJ1 - 4.7 MB	FUJ1 2.3 MB
FUJ2 - 1.2 MB	FUJ2 - 4.7 MB	FUJ2 2.3 MB
		FUJ3 2.3 MB
		FUJ4 2.3 MB

23 MEGABYTE FUJITSU

Configuration A	Configuration B	Configuration C
FUJ1 - 8.3 MB	FUJ1 - 4.7 MB	FUJ1 2.3 MB
FUJ2 - 1.2 MB	FUJ2 - 4.7 MB	FUJ2 2.3 MB
FUJ3 - 8.3 MB	FUJ3 - 4.7 MB	FUJ3 2.3 MB
FUJ4 - 1.2 MB	FUJ4 - 4.7 MB	FUJ4 2.3 MB
		FUJ5 2.3 MB
		FUJ6 2.3 MB
		FUJ7 2.3 MB
		FUJ8 2.3 MB

Note that with the 23 megabyte Fujitsu drive, you have exactly twice the number of available logical drives than with the 11 megabyte. Which configuration you choose depends largely on the type and size of your applications. Read the discussion on FUJFMT in Section 5.4.2 for more information.

If you assign at least one Fujitsu logical drive to your system, DYNASYS will automatically invoke the next main menu option -- DS -- which will ask the size of your Fujitsu unit (i.e., 11 or 23 megabytes).

3.1.5.4 Micropolis Winchester Drives

Dynabyte's Micropolis Winchester is 45 megabytes. Each platter surface (with the exception of one servo surface) is considered a single logical drive and can store approximately 7.5 formatted megabytes. The 45 megabyte unit consists of 3 platters, hence, 5 logical drives. The logical drive mnemonics available are:

45 MEGABYTE

MW1
MW2
MW3
MW4
MW5

We recommend that you format your Winchester unit with the WFORMAT utility prior to the DYNASYS process. Read the discussion on WFORMAT in Section 5.3.2 for more information.

3.1.5.5 Mini Winchester Drives

5.25" Winchester drives (Mini Winchesters) are available in five sizes: 6MB, 10MB, 12MB, 16MB or 19MB of unformatted storage. Even though drives are formatted at the factory, we recommend that you reformat them with the WINFMT5 program (see Section 5.5.2). WINFMT5 will automatically determine which size Mini Winchester you have and will display the available options for configuring your unit. Then use DYNASYS to assign your logical drives. The following table summarizes the logical drives, their sizes, and maximum number of directory entries (DIR) allowed per Mini Winchester size and the configuration chosen during WINFMT5. Do not assign more logical drives than are available to you under the size of your drive and configuration chosen.

6 MB MINI WINCHESTER

Configuration A	Configuration B
MINI1 - 4.9 MB	MINI1 - 2.48 MB MINI2 - 2.48 MB

10 MB MINI WINCHESTER

Configuration A	Configuration B	Configuration C
MINI1 - 8.3 MB	MINI1 - 4.2 MB MINI2 - 4.2 MB	MINI1 - 2.1 MB MINI2 - 2.1 MB MINI3 - 2.1 MB MINI4 - 2.1 MB

12 MB MINI WINCHESTER

Configuration A	Configuration B	Configuration C
MINI1 - 8.33 MB MINI2 - 1.96 MB	MINI1 - 5.14 MB MINI2 - 5.14 MB	MINI1 - 2.57 MB MINI2 - 2.57 MB MINI3 - 2.57 MB MINI4 - 2.57 MB

16 MB MINI WINCHESTER

Configuration A	Configuration B	Configuration C
MINI1 - 8.33 MB	MINI1 - 6.4 MB	MINI1 - 3.2 MB
MINI2 - 4.49 MB	MINI2 - 6.4 MB	MINI2 - 3.2 MB
		MINI3 - 3.2 MB
		MINI4 - 3.2 MB

19 MB MINI WINCHESTER

Configuration A	Configuration B	Configuration C
MINI1 - 8.33 MB	MINI1 - 7.22 MB	MINI1 - 3.86 MB
MINI2 - 7.11 MB	MINI2 - 7.22 MB	MINI2 - 3.86 MB
		MINI3 - 3.86 MB
		MINI4 - 3.86 MB

Your configuration choice will depend largely on the type and size of your applications.

3.1.5.6 Example

Below is a sample disk drive assignment for a typical system that incorporates both a floppy drive and a 23 megabyte Fujitsu drive. Note that at the prompt DRIVE M:, a carriage return displays the DA option menu and the newly assigned disk drives.

DRIVE TO CHANGE A-P (RETURN TO LEAVE AS IS) ? A

DRIVE A: F1<CR>
 DRIVE B: F2<CR>
 DRIVE C: F3<CR>
 DRIVE D: F4<CR>
 DRIVE E: FUJ1<CR>
 DRIVE F: FUJ2<CR>
 DRIVE G: FUJ3<CR>
 DRIVE H: FUJ4<CR>
 DRIVE I: FUJ5<CR>
 DRIVE J: FUJ6<CR>
 DRIVE K: FUJ7<CR>
 DRIVE L: FUJ8<CR>
 DRIVE M: <CR>

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

DISK DRIVE ASSIGNMENTS

F1 - F4 = FLOPPY DISK DRIVES
 CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
 CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
 FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
 MIN1 - MIN18 = MINI WINCHESTER (5 1/4")
 MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

A: = F1	E: = FUJ1	I: = FUJ5	M: =
B: = F2	F: = FUJ2	J: = FUJ6	N: =
C: = F3	G: = FUJ3	K: = FUJ7	O: =
D: = F4	H: = FUJ4	L: = FUJ8	P: =

DRIVE TO CHANGE A - P (<RETURN> TO LEAVE AS IS) ?

A final carriage return either returns you to the DYNASYS main menu, or if the AL option is in effect, moves you to the next option -- DS (Disk Drive Setup).

3.1.6 The DS Option: Disk Drive Setup

This option is executed only if a Fujitsu Winchester hard disk drive (any mnemonic from FUJ1 - FUJ8) was specified in the previous Disk Drive Assignments (DA) option. The DS option will simply ask which size FUJITSU drive you are configuring: 11 or 23 megabytes. If you have not assigned a Fujitsu drive in the Disk Assignments above, then this option will have no effect.

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

WHICH SIZE FUJITSU DRIVE DO YOU HAE:

0 = 11 MEGABYTE DRIVE
 1 = 23 MEGABYTE DRIVE

ENTER DRIVE SIZE ? 1<CR>

A final carriage return either returns you to the DYNASYS main menu, or if the AL option is in effect, moves you to the next option -- CM (Chain Module Setup).

3.1.7 The CM Option: Chain Module Setup

The CM option allows you to designate a command line of up to 128 characters to be automatically executed during every cold or warm boot. For instance, COLD CHAIN could be used to chain cold boots to the WordStar word processing

program, giving computer-naive users immediate and easy access to a powerful word processor. Likewise, warm chain can be used, via a designated command line, to move a user directly from one program to another every time a warm boot occurs (at the completion of a program). Thus, your system can be configured such that untrained users are moved directly into friendly applications programs. For both cold and warm chains, however, the command line must be a valid system level command.

The CM option will display the current status of both the cold and the warm chain modules -- whether or not they are presently installed -- and the command line to be executed for each if they are installed. You can then either install or not install the option for both cold and warm boot. The original CM menu display, before any chains are installed, is shown below. A sample cold and warm chain are then installed in the example. The cold chain command, RUN MANAGER, will invoke the BUSINESS MANAGER program every time the system is cold booted. The Warm Chain command, WS, will call up the WordStar word processor each time the system is warm booted.

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

CHAIN MODULE SETUP

CC) COLD CHAIN = NOT INSTALLED
WC) WARM CHAIN = NOT INSTALLED

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ? CC<CR>

(CC) COLD CHAIN (I-INSTALL / N-NOT INSTALL) ? I<CR>
COLD CHAIN COMMAND LINE (UP TO 128 CHARACTERS IN LENGTH):

RUN MANAGER<CR>

(WC) WARM CHAIN (I-INSTALL / N-NOT INSTALL) ? I<CR>
WARM CHAIN COMMAND LINE (UP TO 128 CHARACTERS IN LENGTH):

WS<CR>

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

CHAIN MODULE SETUP

CC) COLD CHAIN = INSTALLED
RUN MANAGER
WC) WARM CHAIN = INSTALLED
WS

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ? <CR>

A carriage return entered in response to the above prompt will put you back at the DYNASYS main menu, or if the AL option is in effect, at the next option -- DL.

3.1.8 The DL Option: Disk Log / Message Setup

The DL option allows you to perform several operations. You may specify which disk drive is to be logged onto during cold boots and warm boots (also called reboots). DL allows you to specify a log disk drive other than the default drive A. The assigned log drives may be different for each type of boot. This feature would, for example, enable the initial cold boot to be performed from a floppy disk, but the warm boot (a reload of the CCP and BDOS modules of CP/M) to be performed from a hard disk on the system -- a much faster operation.

DL also allows you to install a text file to be displayed instead of the DYNABYTE DOS 3 sign-on message during cold boot. This file, which could be created efficiently and attractively with the WordStar word processor, can consist of up to 1,920 characters. The initial screen display can therefore be completely customized. Depending on the effect you want, you can create a screen display which is inviting, informative and professional. This file must be created prior to the DYNASYS program that installs it and must be terminated with a dollar sign (\$). Do not, therefore, use a "\$" in the content of the file. Specifying the name of a nonexistent file for your cold boot message will not generate an error message until the CD option is used.

Finally, the System Load Map display can be turned off or on. By default, the System Load Map is the first thing you see upon booting Dos 3. It summarizes which modules comprise the operating system, their addresses in memory and their size. This information is useful to some users and not to others. By turning the display off, those users who don't need to see the Load Map don't have to.

Following is the menu display for the DL option before any of its parameters have been altered. Then in the example, B is assigned as the log drive for cold boots; E is set up as the log drive for warm reboots; a previously created cold boot message file named Pretty.Pic is installed; and the System Load Map is turned off. Note that the subsequent menu display incorporates these new parameters.

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK LOG / MESSAGE SETUP

CL)	COLD BOOT LOG DRIVE = A
WR)	WARM REBOOT DRIVE = A
CM)	COLD BOOT MESSAGE FILE = NOT INSTALLED
DL)	DISPLAY LOAD MAP = YES

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ? CL<CR>
 (CL) COLD BOOT LOG DRIVE (A-P) ? B<CR>
 (WR) WARM REBOOT DRIVE (A-P) ? E<CR>
 (CM) COLD BOOT MESSAGE FILE (FILENAME.TYP) ? PRETTY.PIC<CR>
 (DL) PRINT LOAD MAP DURING COLD BOOT (Y-YES/N-NOT) ? N<CR>

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

DISK LOG / MESSAGE SETUP

CL)	COLD BOOT LOG DRIVE = B
WR)	WARM REBOOT DRIVE = E
CM)	COLD BOOT MESSAGE FILE = PRETTY .PIC
DL)	DISPLAY LOAD MAP = NO

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ?

A carriage return entered in response to the above prompt will put you back at the DYNASYS main menu, or if the AL option is in effect, at the next option -- LS.

3.1.8.1 Cold Boot Log Drive

The log drive is the drive that is automatically selected when the system is accessed via a cold boot. Since the log drive is by default drive A, you will find yourself on drive A (prompt A>) unless the CL option is used. CL (Cold Boot Log Drive) can be a real convenience if you frequently use a drive other than the default log drive A. It allows you to assign another disk drive in your system as the log drive. For instance, say that on your system, drives A through D are floppy disk drives and drives E through H are hard disks. If you normally do more work on your hard disk units, you could assign drive E, F, G, or H as your log drive. Then, because a cold boot puts you directly on a hard disk unit, you don't have to change the current drive so often. See Section 9.2 for more information on the cold and warm disk log.

3.1.8.2 Warm Reboot Drive

The warm reboot drive is also by default drive A. This means that every time your computer finishes executing a program, it uses drive A to reload a portion of the operating system. Hard disk units can perform this task faster than floppy units. It would therefore be more efficient for you to assign a hard disk drive, if you have one, as your warm reboot drive.

A word of caution, however. Don't assign a drive as the warm reboot drive that is not already installed on your system. Section 2 describes how to properly install a hard disk as a warm reboot drive.

3.1.9 The LS Option: Load / Save Parameter File

The LS option allows you to save, as a file on the disk, all of the parameters you have specified in the current DYNASYS program. This disk file can be reconfigured at a later time to any other values, including the default ones. Alternately, LS allows you to load a previously created disk file from which the parameters for the current DYNASYS program are to be taken. The LS option also allows you to clear all parameters to null values.

We recommend using LS to save your parameters in a file so that the file can be later recalled with DYNASYS and the values easily reset. Saving your parameter file with LS saves you from having to reset all the DYNASYS parameters when there are, perhaps, only a few parameters that you want to change.

An LS menu that is called up by a previous AL option will be displayed after, not before, the DC option (contrary to the sequence of options listed in the main menu display). This allows you to check your parameter values before you save them.

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

LOAD / SAVE PARAMETER FILE

```
| LP) LOAD PARAMETER AREA FROM A FILE |  
| SP) SAVE PARAMETER AREA TO A FILE  |  
| CP) CLEAR PARAMETER AREA           |
```

ENTER MENU ITEM (ENTER RETURN TO EXIT TO MAIN MENU) ?

Below are shown the 3 possible responses to the LS menu (i.e., LP, SP, and CP) and the subsequent queries from DYNASYS.

3.1.9.1 The Load (LP) Option

As you can see in the following example, typing a nonexistent file name to the LP option (LOAD PARAMETER AREA FROM A FILE) generates an error message. The named file must have been previously created with DYNASYS. Notice that DYNASYS does find and accept the file named PARAMTR.SYS (previously created with DYNASYS).

Example

ENTER MENU ITEM (ENTER RETURN TO EXIT TO MAIN MENU) ? LP<CR>

FILENAME: ? WINDEM.UP<CR>
 A:WINDEM .UP FILE NOT FOUND

FILENAME: ? PARAMR.SYS<CR>

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

LOAD / SAVE PARAMETER FILE

LP)	LOAD PARAMETER AREA FROM A FILE	
SP)	SAVE PARAMETER AREA TO A FILE	
CP)	CLEAR PARAMETER AREA	

ENTER MENU ITEM (ENTER RETURN TO EXIT TO MAIN MENU) ?

Note that DYNASYS gives you another opportunity to use the LS option after completing one of its branches. The LS menu is again displayed, offering the 3 LOAD/SAVE choices.

3.1.9.2 The Save (SP) Option

The name of the file that you designate to receive the DYNASYS parameters need not exist prior to using the SP option (SAVE PARAMETER AREA TO A FILE). DYNASYS will create a new file with the name you give it at the FILENAME: ? prompt. This file will contain the values you've specified (and the values you've left unchanged) in the current DYNASYS program.

Example

ENTER MENU ITEM (ENTER RETURN TO EXIT TO MAIN MENU) ? SP<CR>

FILENAME: ? VALUES.SAV<CR>

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

LOAD / SAVE PARAMETER FILE

LP)	LOAD PARAMETER AREA FROM A FILE	
SP)	SAVE PARAMETER AREA TO A FILE	
CP)	CLEAR PARAMETER AREA	

ENTER MENU ITEM (ENTER RETURN TO EXIT TO MAIN MENU) ?

Again, DYNASYS gives you the opportunity to use the LS option after completing one of its branches.

3.1.9.3 The Clear (CP) Option

CP (CLEAR PARAMETER AREA) allows you to clear all parameters, including the default ones, to null values. CP will leave NO assignments in the following areas: Character I/O; Disk Drives; Modules Included; and Warm Logon Drive. This option is useful if you want to change the values of many DYNASYS parameters; CP would save you having to individually clear all existing values.

Note that CP protects you from inadvertently clearing values by issuing a warning. CP executes only if a "Y" is typed in response to its query. Typing either "Y" or "N" puts you back at the LS menu.

Example

ENTER MENU ITEM (ENTER RETURN TO EXIT TO MAIN MENU) ? CP<CR>

*** WARNING ***

THIS OPTION WILL RESET ALL PARAMETERS TO BLANKS,
AND DESTROY ANY PARAMETERS ALREADY ENTERED.

VERIFY CLEAR ALL PARAMETERS (Y-YES/N-NO) ? Y<CR>

3.1.10 The DC Option: Display Current Configuration

On a single screen, 80 by 24 characters in size, the DC option summarizes all of the DYNASYS parameters and their current values. At this point, you can verify that the parameters you have entered during the current DYNASYS program reflect your wishes. If you want to change any values, you may simply recall the appropriate DYNASYS options.

The following DC display summarizes all the default DYNASYS parameters.

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX

CP/M 2.2 SYSTEM REGENERATION UTILITY

***** DYNABYTE DOS 3 STATUS UTILITY *****

CHARACTER I/O		DISK DRIVE	MODULES	BAUD RATES AND
CONSOLE	LIST	ASSIGN	INCLUDED	INSTALLATION MESSAGES
0=CPU2	0=CPU1	A:=F1	1=CPUIO .SPR	CPU1: 300 BAUD / 2 SB
1=	1=	B:=F2	2=FLOPPY .SPR	CPU2: 9600 BAUD / 2 SB
2=	2=	C:=F3	3=MINIWINI.SPR	
3=	3=	D:=F4	4=FUJITSU .SPR	
		E:=MINI1	5=	
READER	PUNCH	F:=MINI2	6=	COLD LOGON: A DRIVE
		G:=FUJ1	7=	WARM LOGON: A DRIVE
0=CPU1	0=CPU1	H:=FUJ2	8=	
1=	1=	I:=	9=	SYSTEM MEMORY SIZE: 57K
2=	2=	J:=	A=	MODEM PASSWORD:
3=	3=	K:=		
		L:=		
		M:=		READER WORD LENGTH: 7
		N:=		COLD MSG: NOT INSTALLED
		O:=		
		P:=		COLD CHAIN: NOT INSTALLED
				WARM CHAIN: NOT INSTALLED
MODEM				
TYPE: DC HAYES				
300 BAUD 1 ST BIT				
WRD LEN=8 PAR=NONE				

The following DC display summarizes the values that have been set in the DYNASYS discussion examples.

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX

CP/M 2.2 SYSTEM REGENERATION UTILITY

***** DYNABYTE DOS 3 STATUS UTILITY *****

CHARACTER I/O		DISK DRIVE	MODULES	BAUD RATES AND
CONSOLE	LIST	ASSIGN	INCLUDED	INSTALLATION MESSAGES
0=CPU2	0=OCT4	A:=F1	1=CPUIO .SPR	CPU1: 300 BAUD / 2 SB
1=OCT3	1=	B:=F2	2=FLOPPY .SPR	CPU2: 9600 BAUD / 2 SB
2=	2=	C:=F3	3=FUJITSU .SPR	
3=	3=	D:=F4	4=OCTAPORT.SPR	
		E:=FUJ1	5=CHAIN .MSG	
READER	PUNCH	F:=FUJ2	6=COLDBOOT.MSG	
		G:=FUJ3	7=	COLD LOGON: B DRIVE
0=CPU1	0=CPU1	H:=FUJ4	8=	WARM LOGON: E DRIVE
1=	1=	I:=FUJ5	9=	
2=	2=	J:=FUJ6	A=	SYSTEM MEMORY SIZE: 57K
3=	3=	K:=FUJ7		MODEM PASSWORD: 12345678
		L:=FUJ8		
MODEM		M:=		READER WORD LENGTH: 7
		N:=		COLD MSG: INSTALLED
TYPE: PMMI		O:=		
600 BAUD	1 ST BIT	P:=		COLD CHAIN: INSTALLED
WRD LEN=8	PAR=NONE			WARM CHAIN: INSTALLED

3.1.11 The CD Option: Create System Disk

You can create a system disk with the CD option in one of two ways. You can create a system disk which incorporates the parameters you've specified during the current DYNASYS program, or you can copy the boot portion, including all of its DYNASYS parameters, from one disk to another. The CD option will ask for the source disk drive that contains all of the modules needed to create a system. CD will also prompt you to name a destination drive. The disk contained in the destination drive will be the new system disk. The new system disk can then be used to boot DOS 3 with the parameters set by the DYNASYS program.

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY

CREATE SYSTEM DISK

```
| WR)  WRITE SYSTEM TO DISK          |  
| TR)  TRANSFER SYSTEM FROM ONE DISK TO ANOTHER |
```

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ?

Below are shown the two possible responses to the CD menu and the subsequent responses from DYNASYS.

3.1.11.1 The Write (WR) Option

Use the WR option when either the source or destination disk drives is a hard disk.

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? WR<CR>

(WR) SYSTEM FILES LOCATED ON DISK DRIVE (AP) ? A<CR>

WRITE SYSTEM TO DISK DRIVE (AP) ? B<CR>

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE. <CR>

NOW WRITING SYSTEM, PLEASE WAIT.

PRESS <RETURN> TO DISPLAY MENU.

If WR tells you that a required file is missing, copy (PIP) that file onto the source disk drive from the original distribution media. Then the WR option will execute successfully.

The final Carriage Return puts you at the CD menu again.

3.1.11.2 The Transfer (TR) Option

Use the TR option when the source and destination drives are both floppy drives.

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? TR<CR>

(TR) TRANSFER SYSTEM FROM DISK DRIVE (A-P) ? A<CR>

TO DISK DRIVE (A-P) ? B<CR>

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE. <CR>

NOW TRANSFERRING SYSTEM. PLEASE WAIT.

PRESS <RETURN> TO DISPLAY MENU.

A final carriage return will put you at the CD menu.

3.1.12 The EX Option: Exit to Operating System

When you are finished running DYNASYS, the EX option returns you to the operating system. If you have changed any parameters without saving them with either the CD or LS option, you will be asked if you intentionally want to exit without saving the parameters.

You will receive one of the following messages upon typing EX and a Carriage Return.

- 1) If you have NOT saved your changes using either the CD or LS option:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

**YOU HAVE NOT SAVED YOUR LATEST CHANGES. ARE YOU SURE YOU WANT TO EXIT
WITHOUT SAVING THESE CHANGES (Y-YES, N-NO) ?**

Typing "Y" will display the following message and will exit DYNASYS:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

DYNASYS COMPLETE

Typing "N" will return you to the main DYNASYS menu.

- 2) If you have saved your changes using either the CD or LS option:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3
CP/M 2.2 SYSTEM REGENERATION UTILITY**

DYNASYS COMPLETE

3.2 DYNAGEN

The DYNAGEN utility creates a booting, or system, disk by copying the DOS 3 loader and all booting files from one disk to another.

The outer tracks of a system disk contain the loader, which is a start-up

program. When DOS 3 is booted, the computer reads this loader off the system disk, stores it into the RAM memory of the computer, and then begins executing it. When the loader executes, it reads booting files off the disk and loads DOS 3. To boot DOS 3, therefore, you must have the loader on the outer tracks of the system disk, and the disk must contain the related booting files.

DYNAGEN can be used to copy the booting data from the original distribution disk or any system disk that you have created, so long as the source disk contains the loader and all files necessary to boot. Those files are

CPM.SYS
CPMLDR.COM

The DYNAGEN utility allows you to transfer the booting information from any disk onto any other disk. This can even be from an 8" disk onto a 5.25" disk, from floppy to hard disk, or from hard disk to floppy. This transfer must be performed to create a DOS 3 system disk that is going to be used to boot the system.

In addition, if you are copying from floppy to hard disk or hard disk to floppy disk, you need the loader file that corresponds to the destination disk. These files are explained in Section 3.2.2, THE CT OPTION.

The destination disk must be formatted before you run DYNAGEN. See the discussion on formatting disks in Section 5.

After you have run DYNAGEN, other files you need may be copied to the same destination disk with PIP.

You access DYNAGEN by typing DYNAGEN at the system level prompt:

E>DYNAGEN<CR>

DYNAGEN presents three menu choices:

- TR - to copy a system from floppy disk to floppy disk
- CT - to copy a system from floppy disk to hard disk, or
hard disk to floppy disk
- EX - to return to the operating system

3.2.1 The TR Option (Floppy to Floppy)

If you want to copy a system from one floppy to another, respond with the option TR. You can copy between like-size drives (8" to 8" or 5.25" to 5.25") or between different size floppies (8" to 5.25" or 5.25" to 8"). In the TR mode, DYNAGEN first copies the outer two tracks (the loader) to the destination. It then copies the other two or three files, one at a time. When it is done, it asks you to return to the menu display, at which point you can exit to the operating system or run the program again.

You do not have to be logged onto the drive from which you are copying. In the following example, the user is logged onto drive E. The copy is done from

one floppy disk drive (in this case A) to another floppy disk drive (B).

E>DYNAGEN<CR>

***** DYNAGEN VERSION X.X FOR DYNABYTE DOS 3.XX *****

GENERATE SYSTEM DISK

```

| TR)  TRANSFER SYSTEM FROM ONE DISK TO ANOTHER |
| CT)  TRANSFER SYSTEM USING ".COM" BOOT FILE   |
| EX)  EXIT DYNAGEN                             |

```

YOUR SELECTION ? TR<CR>

(TR) TRANSFER SYSTEM FROM DISK DRIVE (A-P) ? A<CR>

TO DISK DRIVE (A-P) ? B<CR>

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS RETURN TO CONTINUE. <CR>

PLEASE WAIT. WRITING SYSTEM TO FLOPPY DRIVE B.

PRESS RETURN TO DISPLAY MENU.

3.2.2 The CT Option (Hard Disk to Floppy or Floppy to Hard Disk)

The procedure for copying between unlike disks is different in only one respect. Since the loader files are different for each type of disk, a direct copy of the loader from one to the other is not possible. DYNAGEN, therefore, picks up the loader information from one of five loader files. The information in these files is identical to the information in a loader, but it is stored in a file rather than the outer tracks. There are five different loader files, corresponding to the five types of disks available on a Dynabyte computer system:

FPYCPM.COM	Floppy disk loader, both 8" and 5.25"
MINICPM.COM	Mini Winchester loader
MWCPM.COM	Micropolis Winchester loader
FUJCPM.COM	Fujitsu hard disk loader
CMDCPM.COM	Cartridge Module Drive loader

You must have the appropriate loader file on your source disk to run DYNAGEN with the CT option.

To copy from hard disk to floppy or floppy disk to hard, you must use the CT option, since this option uses the loader file instead of the loader itself. DYNAGEN checks the destination disk, determines which kind of disk it is, and copies the appropriate loader file onto the outer track (or tracks). In the following example, the user is logged onto drive E, and is copying from hard disk drive B to floppy disk drive A.

E>DYNAGEN<CR>

***** DYNAGEN VERSION X.X FOR DYNABYTE DOS 3.XX *****

GENERATE SYSTEM DISK

TR) TRANSFER SYSTEM FROM ONE DISK TO ANOTHER
CT) TRANSFER SYSTEM USING ".COM" BOOT FILE
EX) EXIT DYNAGEN

YOUR SELECTION ? CR<CR>

(CT) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? B<CR>

WRITE SYSTEM TO DISK DRIVE (A-P) ? A<CR>

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS RETURN TO CONTINUE. <CR>

PLEASE WAIT. WRITING SYSTEM TO FLOPPY DRIVE A.

PRESS RETURN TO DISPLAY MENU.

3.3 DYNASTAT

DYNASTAT is used to display the current status and assignments of consoles, printers, disk drives, and system parameters in DOS 3. DYNASTAT is especially useful for examining the current set up of the system after a new system has been generated. If you want to change any of the values, you must run the DYNASYS program to create a new configuration for the system.

To run DYNASTAT, simply enter the command DYNASTAT. On a single screen, 80 by 24 characters in size, DYNASTAT will display all of the DYNASYS parameters and their current values, and then automatically return you to the operating system.

A>DYNASTAT<CR>

DYNASYS VERSION X.X - FOR DYNABYTE DOS 3.XX
 CP/M 2.2 SYSTEM REGENERATION UTILITY

***** DYNABYTE DOS 3.XX STATUS UTILITY *****

CHARACTER CONSOLE	I/O LIST	DISK DRIVE ASSIGN	MODULES INCLUDED	BAUD RATES AND INSTALLATION MESSAGES
0=CPU2	0=OCT4	A:F1	1=CPUIO .SPR	CPU1: 300 BAUD / 2 SB CPU2: 9600 BAUD / 2 SB
1=OCT3	1=	B:F2	2=FLOPPY .SPR	
2=	2=	C:F3	3=FUJITSU .SPR	COLD LOGON: B DRIVE WARM LOGON: E DRIVE
3=	3=	D:F2	4=OCTAPORT.SPR	
READER	PUNCH	E:FUJ1	5=CHAIN .MSG	SYSTEM MEMORY SIZE: 57K
0=CPU1	0=CPU1	F:FUJ2	6=COLDBOOT.MSG	
1=	1=	G:FUJ3	7=	READER WORD LENGTH: 7 COLD MSG: INSTALLED
2=	2=	H:FUJ4	8=	
3=	3=	I:FUJ5	9=	COLD CHAIN: INSTALLED WARM CHAIN: INSTALLED
MODEM		J:FUJ6	A=	
TYPE: PMMI		K:FUJ7		
600 BAUD	1 ST BIT	L:FUJ8		
WRD LEN=8	PAR=NONE	M:		
		N:		
		O:		
		P:		

A>

DYNASTAT displays five main blocks of information:

- Character I/O assignments
- Modem characteristics
- Disk drive assignments
- Modules included
- Baud rates and installation messages

Each of these five blocks is described separately below.

3.3.1 Character I/O Assignments

The CHARACTER I/O assignments are displayed in the upper left-hand corner of the DYNASTAT display. Up to four physical devices may be assigned to each of the four types of character I/O devices. CONSOLES and PRINTERS are the most commonly used devices. READERS and PUNCH devices are usually auxiliary in function. See the Digital Research manuals for more information on READERS and PUNCHES.

CHARACTER I/O ASSIGNMENTS

CHARACTER I/O	
CONSOLE	LIST
0=CPU2	0=CPU1
1=OCT2	1=
2=	2=
3=	3=
READER	PUNCH
0=CPU1	0=CPU1
1=	1=
2=	2=
3=	3=

Under the CONSOLE heading are four lines of data, one for each console that can be assigned in DOS 3. They are represented by the logical numbers 0-3. After each console number will appear the current assignment for that console. In the above example, console number 0 is assigned to the physical device CPU2, and console number 1 is assigned to the physical device OCT2. These assignments take the form of mnemonics, and are the same as those used with the CA option of DYNASYS:

```

CPU1 - CPU2 = CPU SERIAL PORTS
OCT1 - OCT16 = OCTAPORTS
USR1 - USR8 = USER I/O DRIVERS
      CPUP   = CPU PARALLEL PORT
MOD1 - MOD8 = AUTO-ANSWER MODEM

```

Under the LIST heading are four lines of data, one for each of the four possible printers that can be installed in DOS 3. They are represented by the logical numbers 0-3. After each number is the mnemonic corresponding to the assignment for each printer. As in the CONSOLE assignments described above, these mnemonics are the same as those used with the CA option of DYNASYS, and correspond to the mnemonics listed above.

3.3.2 Modem Characteristics

Under the MODEM heading in the bottom left-hand corner is displayed the type of modem (PMMI or DC Hayes), and the specifications for that modem. These specifications are set using the CS option of DYNASYS, and include the baud rate (the speed of data transmission), the stop bit setting (the number of bits used to indicate the end of a word), the word length (the number of bits used to define a word), and the parity setting (odd, even, or none -- a data integrity check).

MODEM CHARACTERISTICS

MODEM	
600 BAUD	1 ST BIT
WRD LEN=8	PAR=NONE

3.3.3 Disk Drive Assignments

The DISK DRIVE ASSIGNMENTS are displayed in the column to the right of CHARACTER I/O ASSIGNMENTS. There are sixteen lines of data displayed, one for each of the sixteen disks that can be installed on the DOS 3 system. After each drive letter (A-P), the disk drive assignment is represented as a mnemonic. These mnemonics are the same as those used to make the assignments with the DA option of DYNASYS:

F1 - F4 = FLOPPY DISK DRIVES
 CMR1 - CMR2 = CMD REMOVABLE LOGICAL DRIVES
 CMF1 - CMF10 = CMD FIXED LOGICAL DRIVES
 FUJ1 - FUJ8 = FUJITSU WINCHESTER LOGICAL DRIVES
 MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
 MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

DISK DRIVE ASSIGNMENTS

DISK DRIVE ASSIGN
A:F1
B:F2
C:F3
D:F2
E:FUJ1
F:FUJ2
G:FUJ3
H:FUJ4
I:FUJ5
J:FUJ6
K:FUJ7
L:FUJ8
M:
N:
O:
P:

3.3.4 Modules Included

The **MODULES INCLUDED** column is to the right of the **DISK DRIVE ASSIGNMENTS**, and lists the names of those software modules that were used to generate the currently configured operating system. Only those modules needed to generate the currently configured operating system need take up space on the system disk.

MODULES INCLUDED

MODULES INCLUDED
1=CPUIO .SPR
2=FLOPPY .SPR
3=FUJITSU .SPR
4=OCTAPORT.SPR
5=CHAIN .MSG
6=COLDBOOT.MSG
7=
8=
9=
A=

The following table lists and describes the modules that may be included with DOS 3. Appendix D provides a complete summary of DOS 3 files.

Module	Description
CPUIO.SPR	talks to I/O ports on the CPU board (CPU1, CPU2, or CPUP)
OCTAPORT.SPR	supports several I/O ports on up to two octaport boards (OCT1 - OCT8 on board 1; OCT9 - OCT16 on board 2)
MODEM.SPR	supports (with auto-answer) either a PMMI or DC Hayes (MOD1)
USERIO.SPR	user-supplied I/O drivers; initially USERIO.SPR is a copy of CPUIO.SPR (USR1 - USR8)
FLOPPY.SPR FLOPPY.DAT	drivers and tables for the floppy disks (5.25", 8", single and double density and single and double-sided)
MICROP.SPR MICROP.DAT	drivers and tables for the 45 megabyte Micropolis Winchester
DEBLOCK.SPR DEBLOCK.DAT	deblocking routines and storage, used with MICROP.SPR and CMD.SPR to perform sector deblocking.

CMD.SPR drivers and tables for the Cartridge Module Drive:

CMD32.DAT - Cartridge Module Drive / 32 megabytes
CMD64.DAT - Cartridge Module Drive / 64 megabytes
CMD96.DAT - Cartridge Module Drive / 96 megabytes

MINIWINI.SPR drivers for 5.25" Mini Winchester; five sizes:
MINIWINI.DAT

6 megabytes
10 megabytes
12 megabytes
16 megabytes
19 megabytes

CHAIN.SPR module for cold and warm chaining (CHAIN.SPR is created by DYNASYS, and will not appear in your directory)

COLDBOOT.MSG cold boot message display file (COLDBOOT.MSG is created by DYNASYS, and will not appear in your directory)

USERCODE.SPR user-supplied code loaded by the operating system
(the address for USERCODE.SPR is located at 33 and 34 Hex)

3.3.5 Baud Rates and Installation Messages

The BAUD RATES AND INSTALLATION messages are displayed in the column on the right-hand side of the screen. At the top of this column are the baud rates and the number of stop bits for each of the various character I/O devices. These are assigned using the CS option of DYNASYS.

BAUD RATES AND INSTALLATION MESSAGES

BAUD RATES AND INSTALLATION MESSAGES	
CPU1:	300 BAUD / 2 SB
CPU2:	9600 BAUD / 2 SB
COLD LOGON:	B DRIVE
WARM LOGON:	E DRIVE
SYSTEM MEMORY SIZE:	57K
READER WORD LENGTH:	7
COLD MSG:	INSTALLED
COLD CHAIN:	INSTALLED
WARM CHAIN:	INSTALLED

Under the baud rates are displayed the COLD and WARM LOGON disk drive assignments. In this case, the cold boot would log onto the second floppy drive (logical drive B), but the warm boot (a reload of the CCP and BDOS modules of DOS 3) would log onto the Fujitsu hard disk (logical drive E), as can be seen from the DISK DRIVE ASSIGNMENTS.

SYSTEM MEMORY SIZE displays the relative size of the configured CP/M system, and indicates the relative location of the operating system. For more information on system size, see MOVCPM in Section 3.4.

READER WORD LENGTH displays the number of bits that have been assigned to a binary word for the reader device using the CS option of DYNASYS.

COLD MESSAGE displays the status of the sign-on message to be displayed during a cold boot. If a cold message has been installed, then a text-file will be displayed instead of the DYNABYTE DOS 3 sign-on message during a cold boot.

In the bottom right-hand corner are displayed the status of both the COLD and WARM chain modules. If installed, both allow you to designate a command line of up to 128 characters to be automatically executed during every cold or warm boot.

3.4 MOVCPM Utility

The MOVCPM Utility enables you to relocate your operating system — in effect, adjusting the size of usable memory. Specifically, MOVCPM creates a file which will be incorporated (by using DYNASYS or DYNAGEN) into a new copy of DOS 3. The files that constitute the new operating system will be moved to run in a different portion of memory and will expect memory size to be that which you have specified in the MOVCPM process. Changing the operating system to expect a different quantity of memory is referred to as moving it. This is because you actually adjust the location of the operating system to a higher (or lower) place in memory. Moving the operating system up in memory frees up more room for the Transient Program Area (TPA). Moving the operating system down leaves more room in memory above the operating system, and less room for the TPA. It is in the TPA that user programs are run.

Several situations warrant the use of MOVCPM. Once you have configured your particular system with DYNASYS, you can determine exactly (via the System Load Map) how much memory your system consumes. You can then take advantage of any unused top memory by moving DOS 3 up. This makes the TPA larger. Removing or adding 32K memory boards (up to the 64K maximum) also requires the use of MOVCPM. MOVCPM causes DOS 3 to recognize the newly installed memory. Finally, MOVCPM can be used as part of a process to create a new system disk for a different hardware environment (called SECOND LEVEL SYSTEM REGENERATION).

Implementing a new or relocated operating system is a three step process.

1. Use MOVCPM to set up the .COM file.
2. Use DYNASYS or DYNAGEN to write the new .COM file onto the operating system portion of the booting device.

3. Boot the newly created operating system.

Remember that MOVCPM is the first step to changing a system's size. MOVCPM creates a new .COM file specifying a new system size. (All original .COM files as shipped from Dynabyte specify 57K systems.) The new .COM file must subsequently be incorporated into a system disk (via DYNAGEN or DYNASYS). Thus, to actually install a new system size requires following a MOVCPM process with either DYNAGEN or DYNASYS. This is explained under INSTALLING NEW SYSTEM SIZE later in this section.

A sample MOVCPM process is shown below. Because our current system is COLD (and WARM) BOOTED from a FLOPPY system, option FPY is selected. To successfully change a system size using MOVCPM, you must specify those options that correspond to the type(s) of drives that provide COLD BOOTS and WARM REBOOTS for your system. For instance, if your system is configured to COLD BOOT from a FLOPPY system and to WARM REBOOT from a CMD system, you must use MOVCPM twice: once to specify your floppy system (enter FPY) and another time to specify your CMD system (enter CMD). You must specify the same system size for each system.

In the example below, we specify "62" (the K is assumed) as the the new system size. This will give more room to the TPA. The discussion following the example, Section 3.4.1, Determining Maximum System Size, illustrates how this figure was determined. The number you enter as the system size must be less than or equal to the number of kilobytes (1 kilobyte = 1024 bytes) of memory in your computer. If too large a system size is specified and installed, the system will not boot. 16K is the accepted lower limit.

A>MOVCPM<CR>

**MOVCPM VERSION X.XX - FOR DOS 3
CP/M 2.2 SYSTEM SIZE REGENERATION UTILITY**

	FPY) MOVE A FLOPPY SYSTEM	
	FUJ) MOVE A FUJITSU WINCHESTER SYSTEM	
	MIC) MOVE A MICROPOLIS WINCHESTER SYSTEM	
	CMD) MOVE A CMD SYSTEM	
	MIN) MOVE A 5.25" WINCHESTER SYSTEM	

PLEASE ENTER SELECTION OR <RETURN> TO RETURN TO EXIT ? FPY<CR>

PLEASE ENTER SOURCE DRIVE OR <RETURN> TO RETURN TO MENU ? A<CR>

PLEASE ENTER DESTINATION DRIVE OR <RETURN> TO RETURN TO MENU ? A<CR>

PLEASE ENTER SYSTEM DRIVE OR <RETURN> TO RETURN TO MENU ? 62<CR>

CONSTRUCTING 62K CP/M VERS 2.2

MOVCPM COMPLETE. READY FOR "DYNASYS" OR "DYNAGEN".

3.4.1 Determining Maximum System Size

System sizes vary as a function of the number and type of files (called modules) which comprise the operating system. The System Load Map, which is by default displayed every time DOS 3 is cold booted, shows the starting memory location and size of each module that comprises the operating system. Note in the System Load Map shown below that the last line -- 57K CP/M 2.2 SYSTEM INSTALLED -- reports the size of the current operating system. By subtracting the memory position of the SYSTEM.TOP from the actual top of memory (FFFFH), you can determine how much top memory is currently being unused. For example:

DYNABYTE DOS 3 LOADER

SYSBASE	DAT	0000H	0100H
TPA	DAT	0100H	C600H
CCP	DAT	C700H	0806H
BDOS	SPR	CF06H	0DFAH
EXEC	SPR	DD00H	02FFH
SYSTEM	DAT	E000H	0100H
CPUIO	SPR	E100H	008EH
FLOPPY	SPR	E200H	04C4H
FLOPPY	DAT	E700H	0229H
SYSTEM	TOP	E9FFH	0000H

57K CP/M 2.2 SYSTEM INSTALLED

1. Subtract the memory position of SYSTEM.TOP (E9FFF) from the actual top of memory (FFFFH):

$$\begin{array}{r} \text{FFFFH} \\ - \text{E9FFH} \\ \hline 1600\text{H} \end{array}$$

2. Convert the result to a decimal value:

1600 hex = 5632D

3. Divide by 1024 to convert that value to Kilobytes:

$$\frac{5632}{1024} = 5.5\text{K}$$

4. As calculated, 5.5K of unused space exists at the top of memory. Add its rounded-down value (5K) to the current system size (57K) to determine how large the new system can be:

$$\begin{array}{r} 5 \text{ K} \\ + 57 \text{ K} \\ \hline 62 \text{ K} \end{array}$$

Thus, "62" can be entered (the K is assumed) to the MOVCPM query for the new system size.

When installing a new driver into the system, use MOVCPM to start the system very low at 50K. After installing the new driver, boot the new system. You can move the system back up with a second pass at this procedure using SYSTEM.TOP as a reference. This method avoids the problems associated with not moving the system down far enough to fit in memory. Moving the system down too low prevents DYNAGEN or DYNASYS from running.

3.4.2 Installing New System Size

Once you have determined the optimum size of your operating system (see previous discussion) and have used the MOVCPM utility to specify the new size, you can then install the new system size. Remember that MOVCPM only prepares the system for a change in size; it does not install it. You may actually implement the new system size in one of two ways: by using DYNAGEN or by using DYNASYS. The following discussion outlines how to decide which method to use and how to use each.

3.4.2.1 DYNAGEN

DYNAGEN generates a system disk by copying a system from the source to the destination drive. System size is the only difference DYNAGEN will accommodate between the source and destination copy. The CT option of DYNAGEN is provided specifically for those situations when all you are doing is creating a system disk for a new-sized system. CT will incorporate the file that was generated by the MOVCPM Utility (as well as system files CPM.SYS and CPMLDR.COM) onto the outer boot track(s) of the destination disk. This file, depending on your system type, will be called FPYCPM.COM, FUJCPM.COM, MWCPM.COM, CMDCPM.COM, or MINICPM.COM. You don't have to concern yourself with these file names, however, since the CT option will automatically incorporate the appropriate .COM file onto the new system disk. The TR option will have no effect for MOVCPM.

Use the CT option of DYNAGEN to generate a new system disk which only differs in size from the copied system. The following example shows how DYNAGEN is used to install a new system size. For more information on DYNAGEN, see its discussion in Section 3.2.

Example:

```
A>DYNAGEN<CR>
```

```
DYNAGEN VERSION X.XX - FOR DYNABYTE DOS 3
```

```
GENERATE SYSTEM DISK
```

	TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER	
	CT)	TRANSFER SYSTEM USING ".COM" BOOT FILE	
	EX)	EXIT DYNAGEN	

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU) ? C<CR>

(CT) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? A<CR>

WRITE SYSTEM TO DISK DRIVE (A-P) ? A<CR>

PLEASE PLACE PROPER DISKS IN DRIVES, THEN PRESS <RETURN> TO CONTINUE. <CR>

NOW WRITING SYSTEM, PLEASE WAIT.

PRESS <RETURN> TO DISPLAY MENU.

3.4.2.2 DYNASYS

DYNASYS generates a system disk by constructing a system from the appropriate files (see the earlier discussion of DYNASYS for more information on these system files). DYNASYS is a more complex process than DYNAGEN, so we recommend using DYNAGEN if all you're doing is creating a system disk with a new system size. If, however, you are making additional modifications to a system, you should use DYNASYS. Read the section on DYNASYS for instructions on reconfiguring system parameters other than size. For the purposes of this discussion, we will only address DYNASYS in terms of changing system size.

Use DYNASYS to establish a system of a different size only if you are simultaneously configuring other system parameters. The following example shows the necessary steps to create a new system disk using DYNASYS. After invoking DYNASYS, the CD option is specified. In response to the CD menu, WR is entered. (The TR option will have no effect for MOVCPM.) The system files on disk drive A are used as the source and the new system disk is written back to drive A.

Example:

A>DYNASYS<CR>

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3
CP/M 2.2 SYSTEM REGENERATION UTILITY

MAIN MENU OPTIONS

AL)	ASSIGN / SETUP ALL PARAMETERS
SC)	SET CLEAR SCREEN SEQUENCE
CA)	CHARACTER I/O ASSIGNMENTS
CS)	CHARACTER I/O SETUP
DA)	DISK DRIVE ASSIGNMENTS
DS)	DISK DRIVE SETUP
CM)	CHAIN MODULE SETUP
DL)	DISK LOG / MESSAGE SETUP
LS)	LOAD / SAVE PARAMETER FILE
DC)	DISPLAY CURRENT CONFIGURATION
CD)	CREATE SYSTEM DISK
EX)	EXIT TO OPERATING SYSTEM

ENTER MENU ITEM ? CD<CR>

DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3
CP/M 2.2 SYSTEM REGENERATION UTILITY

CREATE SYSTEM DISK

WR)	WRITE SYSTEM TO DISK
TR)	TRANSFER SYSTEM FROM ONE DISK TO ANOTHER

ENTER MENU ITEM (RETURN TO EXIT TO MAIN MENU ? WR<CR>

(WR) SYSTEM FILES LOCATED ON DISK DRIVE (A-P) ? A<CR>

WRITE SYSTEM TO DISK DRIVE (A-P) ? A<CR>

PLEASE PLACE PROPER DISKS IN DRIVE, THEN PRESS <RETURN> TO CONTINUE. <CR>

NOW WRITING SYSTEM, PLEASE WAIT.

PRESS <RETURN> TO DISPLAY MENU.

After the new operating system is on the disk, you may then load the newly configured operating system.

4.0 THE BOOT ROM

The boot ROM chip in your Dynabyte computer can be compared to the starter in your car; it triggers the machine into action. The ROM is the only part of your computer that contains software when it is shipped to you. That software performs the booting procedure, which then takes over and loads the software that represents the operating system you have chosen to use in your computer.

Each time you turn on the computer, or push the reset button, you are "booting the computer." Booting consists of copying the operating system into memory. The operating system is stored on a system disk, either the distribution disk that was supplied by Dynabyte, or one you have subsequently created by running the DYNAGEN and DYNASYS programs.

Your initial boot, of course, must come from the medium -- floppy disk or tape -- on which Dynabyte supplied your operating system. This initial boot is discussed in Section 2. The medium for subsequent boots can be any supported by your boot ROM -- floppy disk or hard disk.

During day-to-day operation, you need not concern yourself at all about the ROM chip or its supporting circuitry and switches. However, three circumstances will require your attention.

1. If you upgrade or change your disk configuration, you may have to change the ROM chip, as different disk (and tape) combinations operate with different ROMs.
2. Older Dynabyte ROM chips (the RB series) were designed to support only the CP/M and MP/M operating systems. The ROM chips now available (the UR series) can boot OASIS as well. If you want to include OASIS as an optional operating system, your system needs a UR ROM. If it does not have one, you must order and install a UR ROM chip.
3. Systems that have tape drives offer several options for booting procedures and for drive configurations. These options require a special ROM chip and special switch settings on two of the computer boards.

Dynabyte ROMs come in three sizes: 256-byte, 512-byte, and 2-kilobyte. The 256-byte ROM supports up to four floppy disk drives for booting. The 512-byte ROMs support both floppy and 5.25" Mini Winchester drives for booting. The 2-kilobyte (2K) ROMs support floppy disk, hard disk, and tape drives, as well as a number of additional features that will be discussed later.

This section describes each of these ROMs and the steps the ROMs take when you boot your system. The discussion on the 2K ROM also covers relevant switch settings on the CPU and floppy disk controller (Main) boards.

The final section of this chapter contains a detailed description of each of the UR ROMs and includes a table showing which ROM chip is shipped as standard for each current Dynabyte computer model.

Note that the information in this chapter applies only after you have installed your system, gone through the initial booting procedure described in

Section 2, and have created one or more system disks. The booting medium -- floppy disk, hard disk, or tape -- is determined by your choice when you create (or copy) a system disk. See Section 3 for a complete discussion of the procedure for creating one or more system disks and storing them on disk or tape.

4.1 256-Byte ROM

If your system boots from floppy drives only, the ROM chip in your system is a 256-byte ROM. This ROM allows you to boot from any of the floppy drives. When you turn on the computer, if your system is configured for both 8" and 5.25" drives, the ROM first attempts to boot from the first 8" drive. If that drive does not exist or contains no disk, the ROM goes to the first 5.25" drive. If neither of these drives contain disks, the ROM goes back to the first 8" drive, and again cycles through both drives. It continues to cycle until you insert a disk in a drive with a select indicator light flashing.

If your system is configured for four 8" drives, the ROM cycles to the first drive of the first pair of 8" drives, then to the first drive of the second pair, and continues to cycle until you insert a disk.

The ROM attempts to boot from the first floppy disk that it encounters. If you insert any disk other than a system disk, the system will fail to boot and you will have to reset the computer and begin the boot procedure again. When the boot is successful, the system prints a load map, a sign-on message, and a prompt. You can then enter any command line allowed by your Dynabyte computer system or your MP/M manual.

The 256-byte ROMs and the drives they support for booting are listed in the following table. See Section 4.4 for a detailed description of each ROM.

Part No.	ROM	Disk Drives Supported
808082	UR1	Two 5.25" SS Micropolis and two 8" Shugart
808083	UR2	Two 5.25" SS Micropolis and two 8" Remex
808084	UR3	Two 5.25" SS Micropolis and two 8" DS Shugart or Remex
808085	UR4	Four 8" DS Shugart or Remex (two Aux/4 cards)
808086	UR5	Four 8" SS Remex (two Aux/4 cards)
808087	UR6	Four 8" SS Shugart (two Aux/4 cards)

The 256-byte ROM is installed on the main controller board in your computer, at position K3, with the notch up.

4.2 512-Byte ROM

Systems configured for both floppy and 5.25" Mini Winchester hard disk drives can be booted from any of the drives if they have a 512-byte ROM. This allows Dynabyte computer systems to function without any floppy disk drives.

When you turn on the computer, the 512-byte ROM first goes to the floppy drive or drives, then to the Mini Winchester (hard disk) drive. It continues to cycle in this order until it finds a floppy to boot from or until the hard disk has spun up to speed.

When the computer is first turned on, it takes approximately 30 to 60 seconds for the hard disk to spin up to speed. If you want to boot from a system that is stored on the hard disk, ensure there is no disk in any floppy drive. The ROM will cycle continuously for 30 to 60 seconds, then boot from the hard disk as soon as it is up to speed. The hard disk must have been previously DYNAGENed properly (see Section 3.1).

This sequence makes it possible for you to store one system on the hard disk, and one or more different systems on floppy disks. During the initial 30 to 60 second period, if you insert a floppy in any drive, then the ROM will boot from that drive. The distribution on the hard disk remains, but is not used for the current session.

The following conditions prevent a boot from the hard disk:

- The disk is not yet up to speed. Be sure to wait a full 60 seconds.
- The hard disk does not contain an operating system.
- Hardware error.

CAUTION: If you have been using the computer and hit the reset key to re-boot from hard disk, remove all floppy disks that you have been using. The system will attempt to boot from the first floppy it encounters, whether it is a system disk or not.

The 512-byte ROMs and the drives they support for booting are listed in the following table. See Section 4.4 for a detailed description of each ROM.

<u>Part No.</u>	<u>ROM</u>	<u>Disk Drives Supported</u>
808088	UR10	Two 5.25" SS Tandon, two 8" SS Shugart, one Mini Winchester
808089	UR11	Two 5.25" DS Tandon, two 8" SS Shugart, one Mini Winchester
808090	UR12	Two 5.25" SS Tandon, two 8" SS Remex, one Mini Winchester
808091	UR13	Two 5.25" DS Tandon, two 8" SS Remex, one Mini Winchester
808092	UR14	Two 5.25" SS Tandon, two 8" DS Shugart or Remex, one Mini Winchester
808093	UR15	Two 5.25" DS Tandon, two 8" DS Shugart or Remex, one Mini Winchester
808102	UR16	Four 8" SS Slimline Tandon and one Mini Winchester
808103	UR17	Four 8" DS Slimline Tandon and one Mini Winchester

The 512-byte ROM is installed on the main controller board in your computer at position K3, with the notch up.

4.3 2K ROM

If your system has tape drives, it uses a more sophisticated ROM called the 2K ROM. This 2K ROM allows considerable flexibility in your decision to include or exclude certain types of drives. If a hard disk drive is installed, the boot procedure can be completed entirely from the hard disk. The system can function without any floppy disk drives. The 2K ROM also allows you to boot the computer from a cartridge tape unit. This allows systems that do not have floppy disks to recover from a failure of the hard disk unit or be initially configured from the tape.

Another feature of the 2K ROM is that you can choose one of three procedures for booting. The first procedure presents a menu and allows you to choose whether to boot from hard disk, floppy disk, or tape. Procedure 2 immediately attempts to boot from hard disk; if this fails, it presents the same menu as procedure 1. Procedure 3 also attempts to boot from hard disk; if that fails, it then attempts to boot from floppy disks. The boot procedure is specified by setting the CPU switches (see Section 4.3.5).

The 2K ROM also contains routines necessary to "check" itself. When you turn on or reset the computer, a small red light (LED) on the tape controller board is turned on. The 2K ROM immediately checks itself to be sure that it is functioning properly. It does this by performing a checksum on its own code and comparing that checksum with the value stored in the ROM itself. If the checksums are equal, the ROM turns off the LED.

If you do not get the boot menu, or if booting does not begin after 60 seconds, you should check the LED on the tape controller board. If the light is on, something is wrong either in the ROM or in the supporting circuitry on the board. Both should be checked by your Dynabyte dealer.

The 2K ROMs and the drives they support for booting are listed in the following table. See Section 4.4 for a detailed description of each ROM.

<u>Part No.</u>	<u>ROM</u>	<u>Disk and Tape Drives Supported</u>
808094	UR40	All the configurations supported by UR1, UR2, UR3, UR4, and UR5 ROMs, plus 8" Fujitsu Winchester, 8" Micropolis Winchester, CDC Phoenix, Mini Winchester, and tape
808095	UR50	All the configurations supported by the UR10, UR11, UR13, UR14, and UR15 ROMs, plus 8" Fujitsu Winchester, 8" Micropolis Winchester, CDC Phoenix, Mini Winchester, and tape
808109	UR60	All the configurations supported by the UR6, UR12, UR16, and UR17, plus 8" Fujitsu Winchester, 8" Micropolis Winchester, CDC Phoenix, Mini Winchester, and tape.

Since the 2K ROM supports tape drives, it is installed on the tape controller board instead of the main controller board. This 2K ROM takes precedence over the ROM on the main board, and that ROM must be turned off (see discussion in Section 4.3.1).

When you install a 2K ROM, you also must change some switch settings on the CPU board. These switches control two aspects of the booting operation: the floppy drive configuration, and the booting procedure you choose.

The 2K ROM has "tables" for all possible floppy disk configurations; even if you are booting from a hard disk system, the floppy disks are automatically recognized by the 2K ROM. This allows you to access all the floppy disk drives that are on your system, even if they are not used for booting. However, the ROM must be told which particular configuration your system has. This is done by setting the switches on the CPU board to inform the ROM which table is appropriate for your system.

In summary, the steps required when a 2K ROM is installed are as follows:

1. Install the 2K ROM on the tape controller board.
2. Disable the main board ROM.
3. Determine booting procedure.
4. Determine floppy drive configuration.
5. Set CPU switches.

Each step is described in detail below.

4.3.1 Installing the 2K ROM

The 2K ROM may already be installed in the tape controller board of your computer. If it is, you will still have to concern yourself with the CPU switch settings to make your computer system operate correctly. These settings are detailed below.

If the ROM is not installed in your computer, then you must install it before you can access tape drives. Be sure the machine is turned off. The ROM is inserted into a 28-pin socket in the tape controller board. The 28-pin socket is in the middle of the board at position A-5. The ROM is inserted with pin 1 facing the upper left-hand corner of the board. (Complete installation instructions are shipped with the 2K ROM.)

4.3.2 Disabling the Main Board ROM

There is always a ROM chip on the main (floppy disk) controller board. When you install a 2K ROM chip on the tape controller board, your system has two ROMs. Two ROMs cannot both be operational at the same time; hence, when your system has a 2K ROM on a tape controller board, the ROM on the main controller board must be disabled. This is done by flipping the top switch on the main controller board open (off).

The other five switch settings on the main controller board set I/O port addresses. These switches are set at the factory, and should never be changed. The correct settings are:

Switch 2	closed
Switch 3	closed
Switch 4	open
Switch 5	closed
Switch 6	closed

To disable the tape drives, remove the tape controller board from your system, and change the setting of the top switch on the main controller board back to closed (on), re-enabling the ROM on the main board.

4.3.3 Booting Procedures

The three booting procedures allowed by the 2K ROM are described below. Since the procedures are controlled by CPU switch settings, you must choose the procedure you want to use before the 2K ROM is installed.

4.3.3.1 Procedure 1

Procedure 1 initializes CPU serial port 2 for 9600 baud and sends a menu to the device connected to that port and OCTAPORT 1. The menu allows you to enter a command to boot the computer from either a floppy disk, a hard disk, or a tape unit connected to the computer:

DYNABYTE CPM/MPM/OASIS BOOT ROM
VERSION XX

H = BOOT FROM HARD DISK
F = BOOT FROM FLOPPY
T = BOOT FROM TAPE

BOOT FROM ?

You can then enter a single letter command, "H", "F", or "T", to make the ROM boot from any one of the devices listed.

If you are booting from the hard disk, remember that it takes up to 60 seconds for the hard disk to spin up to the proper speed for access. The 2K ROM waits until the disk is up to speed before it attempts to boot.

4.3.3.2 Procedure 2

Procedure 2 first attempts to boot the operating system from a hard disk attached to the system. The ROM scans the system for all four types of Dynabyte hard disks:

1. Micropolis Winchester (45 megabytes)
2. Mini Winchester (6, 10, 12, 16, or 19 megabytes)
3. Fujitsu Winchester (11 or 23 megabytes)
4. CMD Cartridge Module (32, 64, or 96 megabytes)

If more than one hard disk has been installed in the system, then the priority is as listed above. The Micropolis is attempted first, then the Mini Winchester, then the Fujitsu, and finally the CMD.

If the ROM finds any hard disk attached to the system, it attempts to boot the operating system from that hard disk. The boot from the hard disk could fail for one of several reasons:

1. The hard disk does not contain a system.
2. The hard disk contains an improper system.
3. The hard disk has a hardware error.

If one of these errors occurs, the ROM prints the message "HARD DISK ERROR" and displays the menu shown above for Procedure 1.

4.3.3.3 Procedure 3

Procedure 3 is similar to procedure 2 in that the ROM first tries to boot the operating system from a hard disk attached to the system. It scans the disks in the same order, but if the hard disk scan fails to find a system, the floppy disks are tried.

The ROM first attempts to boot from an 8" floppy disk drive. If there is no 8" drive or if there is no floppy in the drive, the ROM attempts to boot from a 5.25" floppy disk drive, or from a second pair of 8" floppies if there are no 5.25" drives attached.

After each type of floppy disk drive is tried once, the hard disks are tried again. If the hard disks fail once more, the floppy disks are tried again. This cycle continues until a floppy system disk is inserted, or a hard disk containing a system spins up to speed.

4.3.4 Determining the Floppy Disk Configuration

The other parameter that affects the CPU switches is the drive configuration. The 2K ROM contains a set of tables that reflect every possible drive configuration. For example, there is a table that supports single-sided 8" Shugart drives with any single-sided 5.25" drives. Another table supports single-sided 8" Remex and any single-sided 5.25" drives, and so forth (the complete set of tables is shown later). Since the ROM chip is designed to cover any possible configuration, it is necessary for you to tell the ROM chip which configuration your system has.

Novice users may have some difficulty determining the exact floppy configuration on their system. If you have been using a 256 or 512 byte ROM on the main controller board, the old ROM may provide the information. The label on the ROM corresponds to the drive configuration of your old system.

The tables below, which show switch settings for the UR40, UR50, and UR60 ROM, also include the designation of the smaller ROMs that support comparable floppy configurations.

If the designation on the old ROM is not legible, your Dynabyte dealer can tell you the configuration of your system.

As a last resort, you can determine the correct switch settings by trial and error. Start with the most likely switch settings and try to boot your computer. If that does not work, try another combination and boot again, etc. Be sure you have a copy of the distribution disk you are using, as the trial and error process may damage the disk.

4.3.5 Setting the CPU Switches

The CPU switches are located in the switch block at the top of the CPU board.

The following tables show the correct switch settings for each configuration and boot procedure mode. An asterisk in the bottom row represents a closed switch (on). An asterisk in the top row represents an open switch (off). Note that the floppy configuration and the boot procedure interact to determine the CPU switch settings.

In the tables, the column labeled "Comparable ROM" shows which other ROMs support the same floppy configuration. If you are upgrading to a 2K ROM, match the label on your old ROM to the designation in this column to find your floppy configuration.

SWITCH SETTINGS FOR UR40 ROM CHIP

<u>Floppy Disk Configuration</u>	<u>Comparable ROM</u>	<u>Procedure</u>	<u>Switch Settings</u>	
			P A A A A 0 1 1 1 1 J 5 4 3 2	
Two single-sided 8" Shugart and two 5.25" Micropolis	UR1 or RB1	1	<table border="1"> <tr><td>* * * * *</td></tr> </table>	* * * * *
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		2	<table border="1"> <tr><td>* * * *</td></tr> </table>	* * * *
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		3	<table border="1"> <tr><td>* * *</td></tr> </table>	* * *
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Two single-sided 8" Remex and two 5.25" Micropolis	UR2 or RB2	1	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td>*</td></tr> <tr><td>*</td><td>*</td><td>*</td><td>*</td><td> </td></tr> </table>					*	*	*	*	*	
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Two double-sided 8" Shugart or Remex and two 5.25" Micropolis	UR3 or RB3	1	<table border="1"> <tr><td> </td><td> </td><td> </td><td>*</td><td> </td></tr> <tr><td>*</td><td>*</td><td>*</td><td> </td><td>*</td></tr> </table>				*		*	*	*		*
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Four double-sided 8" Shugart or Remex	UR4 or RB4	1	<table border="1"> <tr><td> </td><td> </td><td> </td><td>*</td><td>*</td></tr> <tr><td>*</td><td>*</td><td>*</td><td> </td><td> </td></tr> </table>				*	*	*	*	*		
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Four single-sided 8" Remex	UR5 or RB5	1	<table border="1"> <tr><td> </td><td> </td><td>*</td><td> </td><td> </td></tr> <tr><td>*</td><td>*</td><td> </td><td>*</td><td>*</td></tr> </table>			*			*	*		*	*
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SWITCH SETTINGS FOR UR50 ROM CHIP

<u>Floppy Disk Configuration</u>	<u>Comparable ROM</u>	<u>Procedure</u>	<u>Switch Settings</u>
			P A A A A Ø 1 1 1 1 J 5 4 3 2
Two 5.25" single-sided Tandon and two 8" single-sided Shugart	UR10 or RB10	1	* * * * *
		2	* * * * *
		3	* * * * *
Two 5.25" double-sided Tandon and two 8" single-sided Shugart	UR11 or RB11	1	* * * * *
		2	* * * * *
		3	* * * * *
Two 5.25" double-sided Tandon and two 8" single-sided Remex	UR13 or RB13	1	* * * * *
		2	* * * * *
		3	* * * * *

Two 5.25" single-sided Tandon two 8" single-sided Shugart or Remex	UR14 or RB14	1	* * * *
		2	* * * *
		3	* * * *
<hr/>			
Two 5.25" double-sided Tandon and 8" double-sided Shugart or Remex	UR15 or RB15	1	* * * *
		2	* * * *
		3	* * * *

SWITCH SETTINGS FOR UR60 ROM CHIP

<u>Floppy Disk Configuration</u>	<u>Comparable ROM</u>	<u>Procedure</u>	<u>Switch Settings</u>
			P A A A A Ø 1 1 1 1 J 5 4 3 2
Four 8" single-sided Shugart	UR6 or RB6	1	* * * * *
		2	* * * *
		3	* * * *
Two 5.25" single-sided Tandon, two 8" single-sided Remex, one Mini Winchester	UR12 or RB12	1	* * * * *
		2	* * * *
		3	* * * *
Four 8" single-sided Slimline Tandon	UR16	1	* * * * *
		2	* * * *
		3	* * * *

Four 8" single-sided
Slimline Tandon

UR17

1

* * * * *
* * * * *

2

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3

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4.4 Detailed Description of the ROMs

The following paragraphs describe in detail each of the UR ROMs available, the configurations that they support, and the boards on which they are located.

UR1 is a 256-byte ROM that resides on the 5200/5010 floppy disk controller board. It supports two 5.25" single-sided Micropolis floppies and two 8" single-sided Shugart floppies. This ROM should only be installed in systems that have Micropolis 5.25" floppies. For Tandon 5.25" floppies, use UR10 or UR11.

UR2 is a 256-byte ROM that resides on the 5200/5010 floppy disk controller board. It supports two 5.25" single-sided Micropolis floppies and two 8" single-sided Remex floppies. This ROM should only be installed in systems that have Micropolis 5.25" floppies. For Tandon 5.25" floppies, use UR12 or UR13.

UR3 is a 256-byte ROM that resides on the 5200/5010 floppy disk controller board. It supports two 5.25" single-sided Micropolis floppies and two 8" double-sided Shugart or Remex floppies. This ROM should only be installed in systems that have Micropolis 5.25" floppies. For Tandon 5.25" floppies, use UR14 or UR15.

UR4 is a 256-byte ROM that resides on the 5010 floppy disk controller board. It supports four 8" double-sided Shugart or Remex floppies. The four drives are treated as two pairs. Each pair must be driven with a separate AUX/4 card that is daisy-chained from one main card. This is a non-standard configuration, and the UR4 ROM must be special ordered from Dynabyte Customer Services.

UR5 is a 256-byte ROM that resides on the 5010 floppy disk controller board. It supports four 8" single-sided Remex floppies. The four drives are treated as two pairs. Each pair must be driven with a separate AUX/4 card that is daisy-chained from one main card. This is a non-standard configuration, and the UR5 ROM must be special ordered from Dynabyte Customer Services.

UR6 is a 256-byte ROM that resides on the 5010 floppy disk controller board. It supports four 8" single-sided Shugart floppies. The four drives are treated as two pairs. Each pair must be driven with a separate AUX/4 card that is daisy-chained from one main card. This is a non-standard configuration, and the UR6 ROM must be special ordered from Dynabyte Customer Services.

UR10 is a 512-byte ROM that resides on the 5505 floppy disk controller board. It supports two 5.25" single-sided Tandon floppies and two 8" single-sided Shugart floppies. This ROM should only be installed in systems that have Tandon 5.25" floppies; it does not function correctly with Micropolis 5.25" floppies. This ROM also has the ability to boot from the Mini Winchester hard disk. It first attempts to boot from the 5.25" floppies, then from the 8" floppies, and finally from the Mini Winchester.

URL1 is a 512-byte ROM that resides on the 5505 floppy disk controller board. It supports two 5.25" double-sided Tandon floppies and two 8" single-sided Shugart floppies. This ROM should only be installed in systems that have Tandon 5.25" floppies; it does not function correctly with Micropolis 5.25" floppies. This ROM also has the ability to boot from the Mini Winchester hard disk. The ROM first attempts to boot from the 5.25" floppies, then from the 8" floppies, and finally from the Mini Winchester.

URL2 is a 512-byte ROM that resides on the 5505 floppy disk controller board. It supports two 5.25" single-sided Tandon floppies and two 8" single-sided Remex floppies. This ROM should only be installed in systems that have Tandon 5.25" floppies; it does not function correctly with Micropolis 5.25" floppies. This ROM also has the ability to boot from the Mini Winchester hard disk. It first attempts to boot from the 5.25" floppies, then from the 8" floppies, and finally from the Mini Winchester. This is a non-standard configuration, and the URL2 ROM must be special ordered from Dynabyte Customer Services.

URL3 is a 512-byte ROM that resides on the 5505 floppy disk controller board. It supports two 5.25" double-sided Tandon floppies and two 8" single-sided Remex floppies. This ROM should only be installed in systems that have Tandon 5.25" floppies; it does not function correctly with Micropolis 5.25" floppies. This ROM also has the ability to boot from the Mini Winchester hard disk. It first attempts to boot from the 5.25" floppies, then from the 8" floppies, and finally from the Mini Winchester. This is a non-standard configuration, and the URL3 ROM must be special ordered from Dynabyte Customer Services.

URL4 is a 512-byte ROM that resides on the 5505 floppy disk controller board. It supports two 5.25" single-sided Tandon floppies and two 8" double-sided Shugart or Remex floppies. This ROM should only be installed in systems that have Tandon 5.25" floppies; it does not function correctly with Micropolis 5.25" floppies. This ROM also has the ability to boot from the Mini Winchester hard disk. The ROM first attempts to boot from the 5.25" floppies, then from the 8" floppies, and finally from the Mini Winchester. This is a non-standard configuration, and the URL4 ROM must be special ordered from Dynabyte Customer Services.

URL5 is a 512-byte ROM that resides on the 5505 floppy disk controller board. It supports two 5.25" double-sided Tandon floppies and two 8" double-sided Shugart or Remex floppies. This ROM should only be installed in systems that have Tandon 5.25" floppies; it does not function correctly with Micropolis 5.25" floppies. This ROM also has the ability to boot from the Mini Winchester hard disk. The ROM first attempts to boot from the 5.25" floppies, then from the 8" floppies, and finally from the Mini Winchester.

URL6 is a 512-byte ROM that resides on the 5605/5305 floppy disk controller board. It supports four 8" single-sided Tandon Slimline floppies. This ROM also has the ability to boot from the Mini Winchester hard disk. It first attempts to boot from the 8" floppies, and then from the hard disk.

URL7 is a 512-byte ROM that resides on the 5605/5305 floppy disk controller board. It supports four 8" double-sided Slimline Tandon floppies. This ROM also has the ability to boot from the Mini Winchester hard disk. It first attempts to boot from the 8" floppies, and then from the hard disk.

UR40 is a 2K ROM that resides on the 5013/5700/5710 tape controller board. It supports the same drives as UR1, UR2, UR3, UR4, and UR5. This ROM also has the ability to boot from either an 8" Micropolis Winchester, an 8" Fujitsu Winchester, a Mini Winchester, a CDC Phoenix hard disk, or a cartridge tape drive. If this ROM is in a system, it takes priority. The ROM on the main board must be disabled. This ROM only works properly with 5.25" Micropolis floppies. Use UR50 for Tandon 5.25" floppies.

UR50 is a 2K ROM that resides on the 5013/5700/5710 tape controller board. It supports the same drives as UR10, UR11, UR13, UR14, and UR15. This ROM also has the ability to boot from either an 8" Micropolis Winchester, an 8" Fujitsu Winchester, a Mini Winchester, a CDC Phoenix hard disk, or a cartridge tape drive. If this ROM is in a system, it takes priority. The ROM on the main board must be disabled. This ROM only works properly with 5.25" Tandon floppies. Use UR40 for Micropolis 5.25" floppies.

UR60 is a 2K ROM that resides on the 5305, 5605 and 5013 add-on tape controller board. It supports the same drives as UR6, UR12, UR16, and UR17. This ROM also has the ability to boot from either an 8" Micropolis Winchester, an 8" Fujitsu Winchester, a Mini Winchester, a CDC Phoenix hard disk, or a cartridge tape drive. If this ROM is in a system, it takes priority. The ROM on the controller board must be disabled.

The following table summarizes all current Dynabyte computer models, the ROM that is shipped as standard, and the location of the ROM chip.

<u>MODEL #</u>	<u>ROM SHIPPED AS STANDARD</u>	<u>INSTALLATION LOCATION</u> (In order of preference)
5100	None	
5200	UR1	5200 Controller
5300-A2	UR1 (Shugart) or UR2 (Remex)	5505/5010 Controller
5300-B2	UR3	5505/5010 Controller
5305-A2	UR16	5305 Controller
5305-B2	UR17	5305 Controller
5400-A2	UR1 (Shugart) or UR2 (Remex)	5200 Controller
5400-B2	UR3	5200 Controller
5505-A1	UR10	5505 Controller
5505-B1	UR11	5505 Controller
5505-C1	UR11	5505 Controller
5500-A1	UR1	5200 Controller
5500-B1	UR1	5200 Controller
5500-C1	UR1	5200 Controller

5600-A1	UR1 (Shugart) or UR2 (Remex)	5505/5010 Controller
5600-B1	UR3	5505/5010 Controller
5600-C1	UR1 (Shugart) or UR2 (Remex)	5505/5010 Controller
5600-D1	UR3	5505/5010 Controller
5600-E1	UR1 (Shugart) or UR2 (Remex)	5505/5010 Controller
5600-F1	UR3	5505/5010 Controller
5605-A2	UR16	5605 Controller
5605-B2	UR16	5605 Controller
5605-C2	UR17	5605 Controller
5615-A1	UR3	5505/5200/5615 Controller
5615-B1	UR3	5505/5200/5615 Controller
5615-C1	UR3	5505/5200/5615 Controller
5700-A2	UR40	Tape Controller
5700-B2	UR40	Tape Controller
5700-C2	UR40	Tape Controller
5710-A1	UR40	Tape Controller
5710-B1	UR40	Tape Controller
5010-01	UR1 (Shugart) or UR2 (Remex)	5505/5200/5010 Controller
5010-02	UR3	5505/5200/5010 Controller
5011-01	None	
5011-02	None	
5011-03	None	
5013-02	UR40	Tape Controller
5013-04	UR40	Tape Controller
5013-06	UR40	Tape Controller
5015-01	UR3	5505/5200/5010 Controller
5015-02	UR3	5505/5200/5010 Controller
5015-03	UR3	5505/5200/5010 Controller

5.0 FORMATTING AND CONFIGURING DISKS

DOS 3 supports a variety of disk and tape mass storage systems. Section 5 describes how to format and configure disks for data storage. Section 6, CARTRIDGE TAPE SYSTEMS, discusses using tape for data storage. Following are the types of disks that DOS 3 supports.

1. Floppy Disks
2. Cartridge Module Hard Disks
 - 32 Megabytes
 - 64 Megabytes
 - 96 Megabytes
3. Micropolis Winchester Hard Disks
 - 9 Megabytes
 - 27 Megabytes
 - 45 Megabytes
4. Fujitsu Winchester Hard Disks
 - 11 Megabytes
 - 23 Megabytes
5. Mini Winchester Hard Disks
 - 6 Megabytes
 - 10 Megabytes
 - 12 Megabytes
 - 16 Megabytes
 - 19 Megabytes

Disk drives write data on a disk and read information from them. The two most common types of disks are floppy disks and Winchester hard disks. The term Cinchester drive refers to a technology where the disk read/write heads "fly" over the disk to retrieve data.

The advantage of hard disks over floppy disks is their much faster data access time (the time it takes to read or write data) and increased storage capacity. Disk size refers to the maximum number of bytes that can be stored on the disk. A byte is equal to a single character, such as a digit, letter, or special character. A 200-word report takes up approximately 1K bytes of space.

Floppy disk systems cost less than hard disk systems, and the floppy disks are easily transportable.

When you use a disk for the first time it must be formatted. This entails writing onto the disk some initial data to identify each sector and track on the disk. This way, when the disk is actually written to, the operating system can check the disk to make absolutely certain that it is writing at the correct place on the disk. Formatting a disk also erases any old data that may have been on the disk. This formatting procedure must be done for both

hard and floppy disks used by the system. It must be performed only when you first use a disk. Each section below includes a discussion of the formatting program used for a specific type of disk. Each type of disk is configured differently under DOS 3, and you have many options to choose from for each type. This section explains those options and describes how the different types of disk drives are used in DOS 3. If you do not know which type of hard disk drive your computer has, check the summary of supported disk drives at the beginning of this section. You can determine which type your drive is by its corresponding storage capacity.

5.1 Floppy Disks

5.1.1 Description

A floppy disk is made of materials similar to cassette tape but is magnetically coated on both sides and is shaped similar to a 45 RPM record. The disk is encased in a flexible plastic envelope, the jacket. The jacket has a slot through which the drive's read/write head can reach the magnetic surface. The drive engages and moves the magnetic medium through a hole in the jacket. Two sizes of floppy disk systems are available with Dynabyte computers: 8" systems and 5.25" systems. The notch on the jacket indicates whether or not the disk can be written on. If the notch is covered on an 8" floppy, the disk can be written on; if the notch is not covered, the disk cannot be written to. On a 5.25" floppy disk, however, the reverse is true. If the notch is covered on a 5.25" floppy, the disk cannot be written on; if the notch is uncovered, the disk can be written on.

Two sizes of floppy disk systems are available with Dynabyte computers: 8" systems and 5.25" systems. The 8" systems may be either double or single-sided, and they may be either double density or single density. The 5.25" systems may be either single or double-sided. They are always double density.

For the space on a floppy disk to be useable, it is "formatted"; that is, it must be partitioned in such a way that its space is addressable. Formatting divides the disk into tracks and sectors.

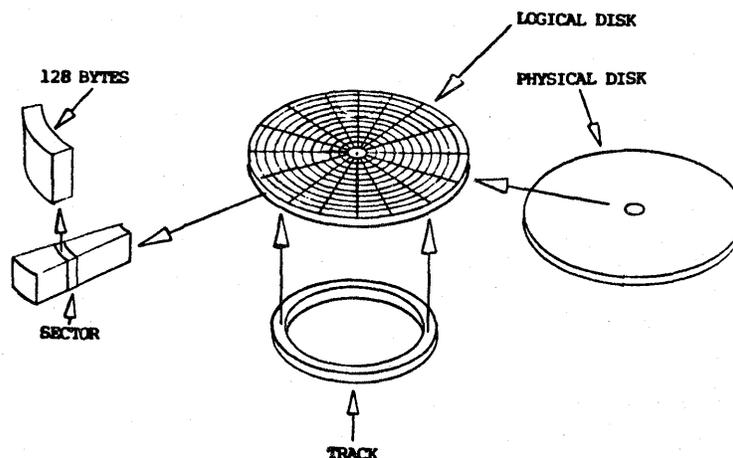


Figure 5.1 Physical Disk and Logical (Formatted) Disk

Furthermore, each sector on a formatted disk has a "header", which is really a preliminary space into which an address for the track and the sector is written. This makes information stored on the floppy disk locatable.

Formatting a floppy disk with a Dynabyte computer is accomplished with the utility program called FFORMAT (see below). Formatting provides options for disk size (8" or 5.25"), whether the drive is single or double-sided, whether you want single or double density, and the number of directories (potential number of storage files) the disk is to contain. The directory is similar to a table of contents of a book. It tells DOS 3 where files are located. Sections 5.1.1.1 and 5.1.1.2 list the options for 8" and 5.25" floppy disks and the resulting "formatted capacity" of the system.

One of the differences between this single-user operating system (DOS 3) and Dynabyte's multi-user operating system (DOS 4) is a difference in skew factors on the floppy disks. DOS 3 disks can be read under DOS 4 but their access will be very slow because of different skew factors. If you are reading CP/M disks (DOS 3) under MP/M (DOS 4), we recommend that you format a blank disk and move the files from the CP/M disk onto the formatted MP/M disk. This will speed up the access to the disk.

5.1.1.1 8" Floppy Disk Systems

The storage capacity for each 8" floppy disk configuration is:

- a) Single-sided, single density:
 $77 \text{ tracks} \times 26 \text{ sectors/track} \times 128 \text{ bytes/sector} =$
 $250\text{K bytes formatted capacity}$
- b) Single-sided, double density:
 In this system, tracks 0 and 1 are formatted single density
 (26 sectors/track), while the remaining 75 tracks (tracks 2-76)
 are formatted double density
 $2 \times 26 \times 128 + 75 \times 54 \times 128 =$
 $512\text{K bytes formatted capacity}$
- c) Double-sided, single density:
 $154 \text{ tracks} \times 26 \text{ sectors/track} \times 128 \text{ bytes/sector} =$
 $500\text{K bytes formatted capacity}$
- d) Double-sided, double density:
 Here, the first two tracks are formatted single-density
 (26 sectors/track), while the remaining 152 tracks are
 formatted double density
 $2 \times 26 \times 128 + 152 \times 54 \times 128 =$
 $1032\text{K bytes formatted capacity}$

5.1.1.2 5.25" Floppy Disk Systems

All 5.25" floppy disk systems are formatted double density, so there are only two configuration options:

- a) Single-sided, double density:
77 tracks X 32 sectors/track X 128 bytes/sector =
315K bytes formatted capacity
- b) Double-sided, double density:
154 tracks X 32 sectors/track X 128 bytes/sector =
630K bytes formatted capacity

In a Dynabyte computer, track usage on a floppy disk is as follows:

- tracks 0-1 reserved for operating system
- all other tracks for floppy disk directory and file storage

Formatting of the floppy disk is accomplished via the FFORMAT utility program. Section 5.1.2 discusses FFORMAT: format (F) and check (C). As already mentioned, formatting partitions physical space on the floppy disk and writes headers, so that the space is addressable and therefore useable.

If the formatting task is selected, FFORMAT prompts the user to enter the number of sides, the density, and the maximum number of directory entries.

The number of directory entries you choose depends on the number and types of files that will be on the disk. If you will be using many short files, increase the number of directory entries. If you will be using a relatively small number of large files, choose a small directory size.

FFORMAT will not ask the first question unless the drive is double-sided. The maximum number of directory entries may be 64, 128, or 256. These numbers correspond to the number of files that a disk may contain. The number of directory entries depends on the number and types of files that will be on the disk. If you will use many short files, increase the directory size; if you will use a relatively small number of large files, select a small number of directory entries. Note: It is always recommended for single-sided, single density, 8" floppy disks that the number of directories be 64, thus making them compatible with single-sided double-density systems of other manufacturers.

Formatting also reports bad sectors by track and sector number.

The checking operation first reports to the user the type of disk, i.e., number of sides, single or double density, and number of directory entries. After reporting the type of disk, the actual checking operation begins, and any errors found are reported to the user by track and sector.

5.1.2 FFORMAT

FFORMAT is the utility used to format a floppy disk. FFORMAT allows you to perform two tasks: format (F) a disk and check (C) a disk's format. The FFORMAT option prepares a new disk (or erases an old disk) for use by DOS 3. The CHECK option verifies the existing format on a disk to confirm that DOS 3 can use it. The density of a floppy disk and the maximum number of directory entries are also set by the FFORMAT program.

FFORMAT should always be run off-line. No other users on the system should be

doing anything! A good way to insure this is to reboot the system with a disk configured for only one terminal. You can then run FFORMAT from this single terminal and be assured that no other user will interfere. This is very important. FFORMAT allows you to format a disk while other users are on-line, but erratic performance may result.

To run FFORMAT simply type its name, followed by a carriage return:

A>FFORMAT<CR>

FFORMAT signs on with the following prompt:

DYNABYTE FLOPPY DISK FORMAT UTILITY

VERSION X.X FOR DOS 3.XX

ENTER 1 - TO USE FIRST FLOPPY DRIVE
2 - TO USE SECOND FLOPPY DRIVE
3 - TO USE THIRD FLOPPY DRIVE
4 - TO USE FOURTH FLOPPY DRIVE

FLOPPY DISK DRIVE TO USE (1, 2, 3 OR 4) ?

FFORMAT is now asking for the floppy disk drive on which you would like to perform the format procedure. The numbering of the floppy drives depends on which floppy was used to boot the system. If you have two 8" drives and two 5.25" drives on your system, then DOS 3 allows you to boot the system on the first 8" drive or the first 5.25" drive. The flashing light on the drive front panel alternately flashes between the 8" and 5.25" drive to tell you that you may boot on either one. If you only have 8" drives or only 5.25" drives, then you do not have a choice and must boot on the first (left-hand) drive on your system.

The drive with which you boot the system becomes floppy drive #1. The drive next to it becomes floppy drive #2. This numbering scheme is independent of the ABCDEFGH drive assignment in DYNASYS. The 1234 numbering scheme is only used for FFORMAT.

If you have four floppy drives on your system, the second pair (the ones not used for booting) become floppy drives 3 and 4.

You must remember which drive you booted the system on to run FFORMAT. You must then tell FFORMAT on which drive (by its number) you would like to perform the format.

After you enter the drive number, FFORMAT selects the drive and prints the type of drive. There are several types of drives that may be connected to a Dynabyte computer. Listed below are the types that may be reported back:

- SINGLE-SIDED 8 INCH DRIVE**
- DOUBLE-SIDED 8 INCH DRIVE**
- SINGLE-SIDED 5 1/4 INCH DRIVE**
- DOUBLE-SIDED 5 1/4 INCH DRIVE**

FFORMAT may also print one of two error messages, which are caused by trying to use a drive that is not attached to the system or using the wrong type of drive.

**CANNOT RECOGNIZE DRIVE TYPE
NO ATTACHED DRIVE**

After FFORMAT reports the type of drive you have selected, it asks you what function you would like to perform:

DO YOU WANT TO:

**F - FORMAT
C - CHECK
Q - QUIT**

YOUR SELECTION ?

You may now select any of the three options. If you would like to format a new floppy disk, then type "F". If you would like to check the format on an existing disk then type "C". If you are finished with the FFORMAT program and would like to return to the operating system, then type "Q".

5.1.2.1 The Format (F) Option

If you select the F option to format a blank or recycled disk, FFORMAT asks you some questions about how you would like to format the disk.

5.1.2.1.1 Side Format

One question is asked about single or double-sided formatting. If you are not using a double-sided drive, then this question will not be asked. If you are using a double-sided drive, then this question is asked to determine how you would like the floppy to be formatted. A double-sided drive can format either a single-sided floppy or a double-sided floppy. If you select a double-sided format option, then make sure that you are using a double-sided disk in the drive.

If the drive is double-sided, then FFORMAT asks:

SIDE FORMAT SELECTION

**1 - FOR SINGLE-SIDED
2 - FOR DOUBLE-SIDED
RETURN - FOR SINGLE-SIDED**

SIDE FORMAT ?

You may enter either "1" or "2" to select single-sided or double-sided format. A carriage return selects single-sided format.

5.1.2.1.2 Density

FFORMAT may next ask you about the density you would like to use on the disk. All 8" drives on Dynabyte computers are capable of either single or double density capacity. All 5.25" drives are automatically double density, so the density question is not asked for 5.25" drives.

If you format an 8" disk for single density and 64 directory entries, the disk is in the IBM standard 8" floppy disk format. Most other 8" systems from other manufacturers can read a Dynabyte single density disk.

If you format an 8" disk for double density, the disk is in a non-standard format. No other manufacturer's system can read a Dynabyte double density disk. However, it provides you with more than twice the storage capacity on the same disk; so if the disk is going to be used exclusively on a Dynabyte computer, it is a good idea to format it for double density and gain the extra storage space. If you are going to use the disk on another manufacturer's system, you should use single density for compatibility.

If you select an 8" drive to format on, FFORMAT prompts you:

DENSITY FORMAT SELECTION

- 1 - FOR SINGLE DENSITY
- 2 - FOR DOUBLE DENSITY
- RETURN - FOR DOUBLE DENSITY

DENSITY FORMAT ?

You may enter "1" or "2" to select the density you wish to use, or hit the return key to select double density.

5.1.2.1.3 Directory Entries

FFORMAT now asks you to enter the number of directory entries to reserve on the disk. You have a choice of 64, 128, or 256 directory entries. It is recommended that you always use 64 directory entries with single-sided single density 8 inch disks. This makes them compatible with other single density systems from other manufacturers. The greater the number of directory entries, the less disk space is available for files. Do not make the directory larger than necessary.

Besides the restriction of single-sided single-density 8" disks, you are free to use up to 256 entries as required. We recommend the following number of directory entries for each configuration:

<u>Configuration</u>	<u>No. of Directory Entries</u>
Single-sided, single-density	64
Single-sided, double-density	128
Double-sided, single-density	128
Double-sided, double density	256

FFORMAT prompts:

NUMBER OF DIRECTORY ENTRIES

- 1 - FOR 64 ENTRIES
- 2 - FOR 128 ENTRIES
- 3 - FOR 256 ENTRIES
- RETURN - FOR 64 ENTRIES

OF DIRECTORY ENTRIES ?

You may now select the number of entries to format the disk for or simply hit the return key to select 64 entries.

FFORMAT then asks you to insert the disk you wish to format into the proper drive and hit the return key to start:

INSERT DISK. HIT ESCAPE TO ABORT OR ANY OTHER KEY TO BEGIN ...

You should now place the disk to format into the drive that you have chosen to perform the format with (1, 2, 3 or 4) and hit the return key to start the actual format process. FFORMAT tells you that it is working and asks you to wait:

.... FORMATING IS NOW BEING DONE PLEASE WAIT ...

If, during the format process, FFORMAT finds a bad sector on the disk and is unable to format it, the error is reported as follows:

******* HARD ERROR *****
HARD ERROR AT TRACK=00 SECTOR=00**

FFORMAT tries several times to reformat that sector, but gives up eventually and reports the above message. This usually indicates a damaged disk. The damaged disk should be removed and the format process tried on a new disk.

After the format process completes and there are no errors, then FFORMAT reports the completion:

******* FORMAT COMPLETED O.K. *******

REPEAT SAME OPERATION ON A NEW DISK (Y/N) ?

FFORMAT has completed formatting the disk you selected and is now asking if you would like to create another disk in that same drive with the same density and directory characteristics.

You may enter "Y" if you would like to create an identical disk. Remove the disk that was formatted and insert another blank or recycled disk into the same drive. FFORMAT asks you to hit return when ready to begin.

If you are finished with the FFORMAT utility or would like to format another disk, but with a different density or drive selection, you should answer the above question "N". FFORMAT then goes back to its original option prompt:

DO YOU WANT TO:

F - FORMAT
 C - CHECK
 Q - QUIT

YOUR SELECTION ?

If you are through with the FFORMAT utility, simply enter "Q" to the question above and FFORMAT returns to the operating system.

5.1.2.2 The Check (C) Option

If you would like to check the disk you just formatted or another disk you suspect to be bad, then enter "C". The check option reads each sector on the disk and verifies that the disk is formatted correctly. Any errors on the disk are reported as shown above.

The check operation does not write on the disk. You may use the check option to verify a disk that has data on it. The integrity of the disk is maintained and you do not lose any existing data. (Be careful though. The "F - FORMAT" option does erase any existing data!).

If you select the "C" option, FFORMAT asks you to insert the disk to be checked into the drive you selected above and hit the return key:

INSERT DISK. HIT ESCAPE TO ABORT OR ANY OTHER KEY TO BEGIN ...

After the return key is hit, the check option reads what type of disk is in the drive and reports it. For example, if you check a disk that has previously been formatted as a single-sided, double density disk, the check option reports:

**DISK IS: SINGLE-SIDED
 DOUBLE DENSITY
 WITH 128 DIR ENTRIES**

After reporting the disk type, FFORMAT begins checking. Any errors found are reported in the hard error format described above. You may attempt to re-format the bad disk. Physically damaged disks can sometimes be recovered in this manner.

If the check operation completes with no errors, then an appropriate message is displayed and the original option prompt returns:

******* CHECK COMPLETED O.K. *******

DO YOU WANT TO:

F - FORMAT
 C - CHECK
 Q - QUIT

YOUR SELECTION ?

If you would like to check another disk, then simply enter "C" again. If you are finished with the FFORMAT utility, then enter "Q" and FFORMAT will return to the operating system.

5.2 Cartridge Module Hard Disks

5.2.1 Description

Dynabyte's Cartridge Module hard disk is available in three different sizes: 32, 64, and 96 megabytes. The Cartridge Module is composed of a series of platters. The 32 megabyte unit contains two platters, the 64 megabyte unit contains four platters, and the 96 megabyte unit contains six platters.

The Cartridge Module's unique feature is its removable cartridge. The removable cartridge is one of the platters housed in a plastic case that can be removed from the Cartridge Module unit.

The 32 megabyte unit has one removable platter and one fixed platter. The 64 megabyte unit has one removable platter and three fixed platters. The 96 megabyte unit also has one removable platter and five fixed platters.

Each physical platter in the Cartridge Module unit can hold approximately 12 megabytes of formatted storage. Since DOS 3 can only access disk drives with a maximum of 8 megabytes, each platter is divided into two logical drives for DOS 3. One logical drive resides on the outer tracks of the platter and one logical drive resides on the inner tracks of the platter. Each drive has approximately 6.5 megabytes of formatted storage.

The 32 megabyte unit therefore appears to DOS 3 as 4 logical disks, two on the fixed platter and two on the removable platter. The 64 megabyte unit appears as 8 logical disks, and the 96 megabyte unit appears as 12 logical disks.

The DYNASYS generation utility is used to configure these logical drives. See Section 3 for more details on running DYNASYS. During the DYNASYS process you are asked for the disk drive assignments for each logical drive on the system. For the Cartridge Module unit, you use the following mnemonics:

CMR1 and CMR2 are the two logical drives from the removable platter. Each of the three sizes of CMD units will always have a removable platter and therefore will have these two logical drives.

CMF1 and CMF2 are the two logical drives from the first fixed platter on the CMD unit. Each of the three sizes of CMD units will always have at least one fixed platter and therefore will have these two logical drives.

CMF3, CMF4, CMF5, and CMF6 are the logical drives from the second and third fixed platters in a CMD unit. Only the 64 and 96 megabyte units contain more than one fixed platter and therefore have these logical drives. CMF7, CMF8, CMF9 and CMF10 are the logical drives from the fourth and fifth fixed platters in a CMD unit. Only the 96 megabyte unit has a fourth and fifth fixed platter, and therefore only the 96 megabyte unit has these logical drives.

You should ascertain the size of the CMD unit installed on your system before running the DYNASYS program. When DYNASYS prompts for the disk drive

assignments, be sure to use only the mnemonics listed above that pertain to the size of CMD unit installed on your system. If you use one of the mnemonics above and your CMD unit does not support it, the system will crash the first time that drive is accessed.

There are two utilities available to the user for maintaining CMD units: HFORMAT and HCOFY. HFORMAT formats any of the platters in any size CMD unit. This utility is discussed below. HCOFY allows you to copy one platter in any size CMD unit to any other platter. This is most useful in backing up one of the fixed platters onto the removable platter. See Section 7.2 for more information on HCOFY.

5.2.2 HFORMAT

HFORMAT formats a Cartridge Module hard disk platter. Dynabyte's 32 megabyte Cartridge Module hard disk contains two platters. One platter is fixed inside the drive and can never be removed; the other is housed in a plastic case and can be used to back up the fixed platter, removed and stored away. The 64 megabyte hard disk unit contains two more fixed platters and the 96 megabyte hard disk unit contains four more fixed platters. There is always only one removable platter.

Before a hard disk platter can be used by the operating system it must be formatted. The fixed platter is usually formatted at the factory. However, it is highly recommended that you reformat all of your hard disk platters when you first receive your hard disk drive.

HFORMAT should always be run off-line; No other users on the system should be doing anything! A good way to insure this is to reboot the system with a disk configured for only one terminal. You can then run HFORMAT from this single terminal and be assured that no other user will interfere. This is very important. HFORMAT allows you to format either the fixed or the removable platter while other users are on-line, but erratic performance may result.

To run HFORMAT simply type:

```
A>HFORMAT<CR>
```

HFORMAT will then sign-on:

DYNABYTE HARD DISK FORMAT UTILITY

VERSION X.X - FOR DOS 3.XX

- ENTER R - FOR REMOVABLE PLATTER
- F1 - FOR FIXED PLATTER # 1
- F2 - FOR FIXED PLATTER # 2
- F3 - FOR FIXED PLATTER # 3
- F4 - FOR FIXED PLATTER # 4
- F5 - FOR FIXED PLATTER # 5

PLATTER TO FORMAT ?

You may now select either "R", "F1", "F2", "F3", "F4" or "F5" to format any platter in the CMD unit. Each platter contains two logical drives for the operating system to use: one on the outer tracks and the second on the inner tracks. HFORMAT formats both logical drives on the platter at the same time.

The 32 megabyte CMD unit only has two platters, one fixed and one removable. The only answers above that would be appropriate are "R" and "F1". The 64 megabyte CMD has "R", "F1", "F2", and "F3". The 96 megabyte CMD has "R", "F1", "F2", "F3", "F4", and "F5".

After you select the platter, HFORMAT formats the selected platter and prints on the console the track numbers in hex notation as it progresses. The display appears like:

```
000 001 002 003 004 005 006 007 008 009 00A 00B 00C 00D 00E ...
```

Each platter on the CMD unit has 808 (0-807) tracks. This is equal to 327 in hex. The numbers continue to be displayed until "327" appears and the HFORMAT returns to the operating system.

Any errors are reported on the console as:

CHECKSUM ERROR

In the event of an error you should try to run HFORMAT again. If the error persists, then use another removable cartridge. If it is the removable cartridge with the error, or if it is the fixed platter, see your Dynabyte dealer for service.

After HFORMAT has formatted with the appropriate platter it is ready for use by the operating system. Once again, you should format all the platters when you receive a new hard disk drive.

You may also run HFORMAT at any time you wish to erase an entire hard disk platter. Be careful though that you do not try to erase only one drive on a platter (each platter contains two logical drives)! HFORMAT formats and erases the ENTIRE platter; thus, both logical drives on the platter are erased. It is a good idea to push the "write protect" button on the front of the hard disk drive for a platter that you do not want to format. This prevents erasing the wrong platter.

5.3 Micropolis Winchester Hard Disks

5.3.1 Description

Dynabyte's Micropolis Winchester is available in three different sizes: 9 megabytes, 27 megabytes, and 45 megabytes. It contains from 1 to 3 platters: one platter in the 9 megabyte unit, two platters in the 27 megabyte unit, and three platters in the 45 megabyte unit.

Each platter has two surfaces. Each surface appears to DOS 3 as a single logical drive, unlike the CMD unit described above that appears as two logical drives per surface. One surface on the first platter, however, is used as a servo surface by the drive to perform accurate head positioning.

The 9 megabyte unit therefore appears to DOS 3 as one logical drive. The 27 megabyte unit appears as three logical drives and the 45 megabyte unit appears as five logical drives. Each physical surface can hold approximately 7.5 megabytes of formatted storage.

The DYNASYS generation utility configures these logical drives. See Chapter 3 for more details on running DYNASYS. During the DYNASYS process, you are asked for the disk drive assignments for each logical drive on the system. For the Micropolis Winchester unit, you may use the following mnemonics:

MW1 is the logical (physical) drive from a 9 megabyte unit. On the Micropolis Winchester, each physical surface appears to DOS 3 as one logical drive.

MW2 and MW3 are the two logical drives for the second and third surfaces in a 27 or 45 megabyte unit. The 27 and 45 megabyte units also have an MW1 drive as described above.

MW4 and MW5 are the two logical drives for the fourth and fifth surfaces in a 45 megabyte unit. The 45 megabyte unit also has the MW1, MW2 and MW3 drives described above.

You should ascertain the size of Micropolis Winchester unit installed on your system before running the DYNASYS program. When DYNASYS prompts for the disk drive assignments, use only the mnemonics listed above that pertain to the size of Micropolis Winchester unit that is installed on your system. If you use one of the mnemonics above and your Winchester unit does not support it, then the system will crash the first time that drive is accessed.

5.3.2 WFORMAT

WFORMAT is used to format a Micropolis Winchester drive. Before any hard disk surface may be used by the operating system, it must be formatted. Even though the surfaces are formatted at the factory, we highly recommend that you format all of your surfaces when you first receive your hard disk drive.

WFORMAT should always be run off-line. This means that no other users on the system should be doing anything! A good way to insure this is to reboot the system with a disk configured for only one terminal. You can then run WFORMAT from this single terminal and be assured that no other user will interfere. This is very important.

To run WFORMAT type:

```
A>WFORMAT<CR>
```

WFORMAT then signs on:

DYNABYTE WINCHESTER FORMAT UTILITY

VERSION X.X - FOR DOS 3.XX

**ENTER MW1 - FOR HEAD 1
 MW2 - FOR HEAD 2
 MW3 - FOR HEAD 3
 MW4 - FOR HEAD 4
 MW5 - FOR HEAD 5
 ALL - FOR ALL HEADS**

HEAD TO FORMAT ?

You may now select either "MW1", "MW2", "MW3", "MW4", "MW5", or "ALL" to format either a single surface or all of the surfaces. Each surface contains one logical drive for the operating system to use. The 9 megabyte Winchester thus appears to DOS 3 as a single drive with approximately 7 megabytes of formatted storage; the 27 megabyte drive appears as three logical drives, each with about 7 megabytes of storage; and the 45 megabyte Winchester appears as five logical drives.

After you select the surface to format, WFORMAT asks you:

DO YOU WANT TO FORMAT OR QUIT (F OR Q) ?

If you respond with "Q", you are returned to the operating system. "F" causes WFORMAT to begin the format process:

FORMATTING DISK

It takes approximately 50 seconds to format each surface. After the format is complete, WFORMAT prints:

FORMAT COMPLETE

After the formatting process is complete, WFORMAT automatically returns to the operating system.

If you selected a surface that is not contained in the Winchester model you have, an illegal head message is displayed and WFORMAT aborts to the operating system.

ILLEGAL HEAD

If you selected "ALL", WFORMAT attempts to format all five surfaces. If you do not have all five surfaces in your Winchester model, then WFORMAT formats the first surface, then the others. When it finds a nonexistent surface, the format procedure ends and the following message is displayed:

**x HEADS FORMATTED.
 FORMAT COMPLETE.**

The number of heads should correspond to the number of surfaces in your drive. Should a different number appear here, you should reformat the disk.

Any errors are reported at the console as:

HARD DISK ERROR CODE x. PLEASE REFER TO YOUR MANUAL.

The Winchester manual gives more details on each of the error codes. Below are the error codes with a short description of possible causes:

- Error codes 1 and 2 - incorrect data
- 3 - drive is no ready
- 4 - drive fault
- 6 - sector not found
- 7 - data reliability error
- 8 - verify error

After WFORMAT has formatted the appropriate surface(s), your Winchester drive is ready for use by the operating system.

You may also run WFORMAT any time you wish to erase an entire surface.

5.4 Fujitsu Winchester Hard Disks

5.4.1 Description

Dynabyte's Fujitsu Winchester is available in two sizes: 11 megabytes and 23 megabytes. The 11 megabyte unit contains 2 platters, and the 23 megabyte unit contains 4 platters.

The Fujitsu Winchester platters are not configured like either the CMD or the Micropolis Winchester described above. Each of those drive types has a physical to logical drive correspondence. The CMD has two logical drives per surface and the Micropolis Winchester had one logical drive per surface. The Fujitsu Winchester can actually be configured by the user in one of three different ways, none of which has an exact logical to physical platter correspondence. The three configurations for a 23 MB unit are:

CONFIGURATION A -----	CONFIGURATION B -----	CONFIGURATION C -----
FUJ1 - 8.3 MB	FUJ1 - 4.7 MB	FUJ1 - 2.3 MB
FUJ2 - 1.2 MB	FUJ2 - 4.7 MB	FUJ2 - 2.3 MB
FUJ3 - 8.3 MB	FUJ3 - 4.7 MB	FUJ3 - 2.3 MB
FUJ4 - 1.2 MB	FUJ4 - 4.7 MB	FUJ4 - 2.3 MB
		FUJ5 - 2.3 MB
		FUJ6 - 2.3 MB
		FUJ7 - 2.3 MB
		FUJ8 - 2.3 MB

The configuration is set at the time you format the Fujitsu Winchester with the FUJFMT program (see below).

The "FUJ1" - "FUJ8" mnemonics are the drive mnemonics that can be used in the DYNASYS program to assign the logical drives after a configuration has been chosen. The 11 and 23 megabytes have been logically separated in all of the configurations. The mnemonics listed above are for a 23 megabyte unit. If you have an 11 megabyte unit, then you have exactly half of the drives available. Thus, configuration A would only be FUJ1 and FUJ2.

Looking at the table above, you can see that each configuration divides the Winchester into different logical drive sizes. In configuration A there are two logical drives on each 11 megabytes of the unit. The first logical drive is 8.3 megabytes in size, FUJ1. This is the largest drive size allowed in an MP/M system. The second logical drive is 1.2 megabytes, FUJ2, which is the amount of remaining storage after the 8.3 megabyte drive has been specified. The second 11 megabytes are divided exactly like the first 11 with one logical drive of 8.3 megabytes, FUJ3, and one logical drive of 1.2 megabytes, FUJ4.

In some situations, a user may not want the Fujitsu Winchester divided as it is in configuration A. The user may not want one large drive and one small one, but drives of equal size. Configuration B divides each 11 megabytes into two equal logical drives of 4.7 megabytes in size. The first 11 megabytes contain two logical drives, FUJ1 and FUJ2, and the second 11 megabytes contain two logical drives, FUJ3 and FUJ4.

There may be some situations in which a user would want the Winchester divided into several smaller logical drive sizes. Configuration C divides the first 11 megabytes into 4 logical drives of 2.3 megabytes in size, FUJ1, FUJ2, FUJ3 and FUJ4. The second 11 megabytes are also divided into 4 logical drives of 2.3 megabytes in size, FUJ5, FUJ6, FUJ7, FUJ8.

The FUJFMT program asks you which of the three configurations you would like to use before it formats the Winchester. You must then decide which configuration best suits the applications that will be run. If you are unsure, we recommend that you use configuration B. This is the best compromise between drive size and logical disk usage.

The 23 megabyte Fujitsu unit has actually been separated by the software into two logical 11 megabyte units. This allows the same software to accommodate both 11 megabyte and 23 megabyte units. The 23 megabyte user has all the mnemonics listed under each configuration, and the 11 megabyte user has exactly half.

After the configuration has been chosen and the Fujitsu Winchester has been formatted, you can install the drive using the DYNASYS utility (see Section 3).

DYNASYS prompts you to enter the logical drive assignments:

- F1 - F4 = FLOPPY DISK DRIVES
- CMR1 - CMR2 = CARTRIDGE MODULE REMOVABLE DRIVES
- CMF1 - CMF10 = CARTRIDGE MODULE FIXED DRIVES
- FUJ1 - FUJ8 = FUJITSU WINCHESTER DRIVES
- MINI1 - MINI8 = MINI WINCHESTER (5 1/4")
- MW1 - MW5 = MICROPOLIS WINCHESTER DRIVES

DRIVE A: ?

In the prompt table the Fujitsu Winchester is listed as FUJ1 - FUJ8. This prompt message is designed to display the maximum number of logical drives available. If you have formatted the Winchester and chosen configuration C, then you have all eight logical drives available, FUJ1 - FUJ8.

If you have chosen either configuration A or configuration B, then you have only four logical drives available, FUJ1 - FUJ4. Recall that if you have an 11 megabyte unit, you have only half this many logical drives.

You must only use the logical drives that are available under the configuration chosen. Do not use any "FUJ" mnemonics for logical drives that will not be on the system after it is booted.

Any of the Fujitsu mnemonics can be used for any of the logical drives in the system, A-P.

5.4.2 FUJFMT

FUJFMT is the utility used to format and configure a Fujitsu Winchester hard disk drive.

FUJFMT should always be run off-line. This means that no other users on the system should be doing anything! A good way to insure this is to reboot the system with a disk configured for only one terminal. You can then run FUJFMT from this single terminal and be assured that no other use will interfere.

To run FUJFMT simply type:

A>FUJFMT<CR>

FUJFMT then signs on:

DYNABYTE FUJITSU WINCHESTER FORMAT UTILITY

VERSION X.X FOR DOS 3.XX

**ENTER F - FORMAT
 C - CHECK
 <RETURN> - RETURN TO OPERATING SYSTEM**

YOUR SELECTION ?

You may now use FUJFMT to either "FORMAT" or "CHECK" a Fujitsu Winchester disk drive. Select the option you want and hit the return key.

FUJFMT asks you which size drive you have:

SELECT THE DRIVE TYPE:

- 0 - 11 MEGABYTE DRIVE
- 1 - 23 MEGABYTE DRIVE

ENTER DRIVE TYPE (0 OR 1) ?

You should now enter the number corresponding to the size of Fujitsu drive you have. Enter a 0 to use an 11 megabyte drive or enter a 1 to use a 23 megabyte drive. You may use the 0 selection to format or check only the first 11 megabytes of a 23 megabyte drive.

If you select the "FORMAT" option, FUJFMT next prompts you to enter the configuration to place the drive in:

DRIVE CONFIGURATION

A	B	C
FUJ1 - 8.3 MB	FUJ1 - 4.7 MB	FUJ1 - 2.3 MB
FUJ2 - 1.2 MB	FUJ2 - 4.7 MB	FUJ3 - 2.3 MB
FUJ3 - 8.3 MB	FUJ3 - 4.7 MB	FUJ5 - 2.3 MB
FUJ4 - 1.2 MB	FUJ4 - 4.7 MB	FUJ7 - 2.3 MB
		FUJ2 - 2.3 MB
		FUJ4 - 2.3 MB
		FUJ6 - 2.3 MB
		FUJ8 - 2.3 MB

PLEASE ENTER DRIVE CONFIGURATION OR <RETURN> FOR B ?

You should now enter the letter of the drive configuration you wish to use with the Fujitsu drive. If you have an 11 megabyte drive, then you have only half of the drives listed above.

Next, the FUJFMT utility will begin to format the drive:

FORMAT IN PROGRESS.

.....

After the drive has completed formatting, the bad track table is displayed.

BAD TRACK TABLE

<u>FIRST 10 MEGABYTES</u>				<u>SECOND 10 MEGABYTES</u>		
<u>BAD TRACK</u>	-	<u>GOOD TRACK</u>	:	<u>BAD TRACK</u>	-	<u>GOOD TRACK</u>
0	-	0000H	:	9	-	0001H
1	-	0001H	:	10	-	0002H
2	-	0002H	:	11	-	0003H
3	-	0003H	:	12	-	0004H
4	-	0004H	:	13	-	0005H
5	-	0005H	:	14	-	0006H
6	-	0006H	:	15	-	0007H
7	-	0007H	:	16	-	0008H
8	-	0008H	:	17	-	0009H

ENTER ITEM TO CHANGE OR <RETURN> TO ACCEPT ?

Every Fujitsu Winchester may have some bad tracks on the disk. This is a natural occurrence and not all drives will have bad tracks on the disk. The drive manufacturer tests each drive under high heat conditions and determines the number and location of bad tracks. These are printed on a card attached to the Fujitsu Winchester drive.

To accommodate these bad tracks on the Winchester, the FUJFMT program writes a bad track table on the Winchester when it formats the drive. There are actually two bad track tables, one for the first 11 megabytes and one for the second 11 megabytes. The bad track table has 9 entries for each 11 megabytes.

The FUJFMT program prompts you to enter any additional bad tracks with the table shown above.

There are nine tracks reserved on each 11 megabytes of the Fujitsu Winchester for bad track substitution. These are tracks 1-9. In the table each bad track is listed next to its good replacement (1-9).

The bad tracks found by the factory and listed on the card attached to the Winchester will have already been entered into the bad track table before the drive left Dynabyte.

You may enter additional bad tracks if they are found later in the life of the drive. You should never change the bad tracks that have already been entered. When you use the "C - CHECK" option in the FUJFMT utility, it reports back any bad tracks that it finds and which 11 megabytes the bad track is on (the first or second 11 megabytes). You may then enter this bad track into the bad track table if it is not already there.

The CHECK option reports bad tracks in logical HEX notation. This is the form that the bad track table requests the entries to be made. Enter bad tracks reported from this option just as it was displayed on the screen.

However, the bad tracks reported from the drive manufacturer are not reported in this logical track manner; they are reported in "cylinder and head" notation. You do not normally need to concern yourself with this notation,

since these bad tracks have already been entered into the bad track table before the drive leaves Dynabyte. If the bad track table is damaged or is inadvertently altered, however, it has to be recreated.

To enter a bad track from the "cylinder - head" notation, first determine whether the bad track resides on the first 11 megabytes or the second. Since there are two bad track tables for the 23 megabyte drive -- one for the first 11 megabytes and one for the second 11 megabytes -- you must decide which table to place the bad track in. The head value determines which bad track table to use. There are 8 heads on a 23 megabyte drive (0-7). The first 4 heads (0-3) reside on the first 11 megabytes and the second 4 heads (4-7) reside on the second 11 megabytes. If you look at the head value listed on the card attached to the drive, you will find a number from 0 to 7. If this head value is less than 4 (0-3), then use the first bad track table for the first 11 megabytes. If the head value is greater than 3 (4-7), then use the second bad track table for the second 11 megabytes.

The head value should then be converted into the range 0 to 3. If the head value is already 0-3, just leave it as it is. If the head value is in the range 4-7, then you must subtract 4 from it to place it in the range 0-3.

To compute the logical bad track simply take the value listed on the card attached to the drive, multiply it by 4 and add the adjusted head number:

$$\text{LOGICAL BAD TRACK} = (\text{CYLINDER} * 4) + (\text{ADJUSTED HEAD VALUE})$$

This logical bad track value can then be entered into the appropriate bad track table. Remember to enter the value into the proper table for the first or second 11 megabytes.

Under normal circumstances you need not concern yourself with the above discussion about bad track computations. As mentioned before, these computations have already been made at Dynabyte before the drive was shipped. If you encounter any additional bad tracks from the CHECK option in the FUJFMT program, they are already reported in the logical bad track notation and are simply entered "as is" in the bad track table.

The bad track table and drive configuration are read off of the drive before it is formatted by the FUJFMT program. When the bad track table is listed on the console, the existing bad tracks are listed as they were entered before. You do not need to re-enter these bad tracks. You may simply hit the return key to keep the bad track table as it is. This allows you to enter the bad track table only once and not have to re-enter it each time the drive is formatted.

This applies to the drive configuration also. If you set the drive up for configuration A, you can simply enter a return when the configuration question is asked the next time you format the drive. This will tell the FUJFMT program to keep the same configuration.

After the bad track table has been set to include all of the bad tracks necessary, then hit return to write the table onto the disk. FUJFMT then completes and returns to the operating system.

FORMAT COMPLETE.

A>

After the drive has been formatted, you should run the CHECK option to find any bad tracks on the drive. If the CHECK option does find some bad tracks and they are not already in the bad track table, then run the FORMAT option again and re-format the drive. After the drive finishes re-formatting you can enter the new values into the bad track tables.

5.5 Mini Winchester Hard Disks

5.5.1 Description

A Mini Winchester disk system is a 5.25" Winchester disk system (a hermetically sealed system with low flying heads that rest on the surface of the disks when the disks are not in motion).

Dynabyte offers Mini Winchester systems in five different storage capacities: 6MB, 10MB, 12MB, 16MB, and 19MB.

The 6MB system, containing 2 disk platters, has four recording surfaces. Each surface has 153 tracks; each track is divided into 17 sectors; and each sector on a track contains 512 bytes. Thus, the total formatted storage capacity is $4 \times 153 \times 17 \times 512 = 5.32\text{MB}$.

The 10MB system, containing two disk platters, also has four recording surfaces. For this system, however, each surface has 256 tracks. The number of sectors (17) and the number of bytes in a sector (512) are the same as for the 6MB system. Thus, the total formatted capacity of this system is $4 \times 256 \times 17 \times 512 = 8.91\text{MB}$.

The 12MB system contains two disk platters -- four recording surfaces. This system, however, provides an increased storage capacity of 306 tracks per surface.

Like the 6MB and 10MB systems, the 12MB system contains 17 sectors per track and 512 bytes per sector. The total formatted capacity of this system is therefore $4 \times 306 \times 17 \times 512 = 10.65\text{MB}$.

The 16MB system contains three disk platters and thus six recording surfaces. Each surface has 256 tracks; the number of sectors is 17; and the number of bytes per sector is 512. Thus, the total formatted capacity of this system is $6 \times 256 \times 17 \times 512 = 12\text{MB}$.

The 19MB system contains three disk platters, thus six recording surfaces. This system, however, provides an increased storage capacity of 306 tracks per surface. Having 17 sectors per track and 512 bytes per sector, the total formatted capacity of this system is $6 \times 306 \times 17 \times 512 = 15.98\text{MB}$.

The first track of a Mini Winchester system is reserved for the operating system; the remaining tracks are used for bad track substitution, directories, and for file storage.

A single Mini Winchester system in a Dynabyte computer contains either two or

three physical hard disk platters (two for the 6MB, 10MB, and 12MB systems; three for the 16MB and 19MB system). The space on these disks may be divided in such a way as to yield one or more "logical" drives, i.e., one or more separate physical drives from the point of view of the Dynabyte computer (CPU). This process of dividing the space on a single disk system is referred to as "configuring" the system (accomplished via the WINFMT5 program, which is described below). Section 5.5.2 lists the possible configurations for each system size.

The various configurations are designed to give you a range of choices suitable to your application. For instance, with a 16MB system, you may choose one large and one small logical drive, two medium size logical drives, or four small logical drives. The choice depends on how many users will be on the system and how much storage capacity each user needs. You should pick the configuration most fitted to the application.

Mini Winchester disk systems must also be formatted. Formatting a system partitions the space on the disks into tracks and sectors and writes a "header" at the beginning of every sector on every track. This makes space on the disks addressable. (See Figure 5.1) Both formatting and configuring a Mini Winchester system are accomplished with the WINFMT5 utility program.

5.5.2 WINFMT5

WINFMT5 is a utility program used for formatting and checking Mini Winchester disk systems.

To run this program, enter "WINFMT5" to the system prompt:

```
A>WINFMT5<CR>
```

The following menu is then displayed:

```
***** DYNABYTE 5.25" HARD DISK FORMAT VERSION X.XX FOR DOS 3.XX *****
```

```
CO) CHECK ONLY
FC) FORMAT AND CHECK
EX) RETURN TO OPERATING SYSTEM
```

YOUR SELECTION:

Enter the code for the desired menu selection (and a carriage return).

5.5.2.1 The Check Only (CO) Option

If you choose the CO option by typing "CO," WINFMT5 checks only for hard errors and displays the bad track table as described below.

5.5.2.2 The Format and Check (FC) Option

If the FC option is chosen, WINFMT5 formats the Mini Winchester system. When

it has completed the formatting process, it prints one of the following messages, depending on the size of your Mini Winchester:

6MB HARD DISK DRIVE

- A) 1 DRIVE : 4.9MB : 1024 DIRECTORY ENTRIES
- B) 2 DRIVES : 2.48MB : 512 DIRECTORY ENTRIES

10MB HARD DISK DRIVE

- A) 1 DRIVE : 8.3MB : 1024 DIRECTORY ENTRIES
- B) 2 DRIVES : 4.2MB : 512 DIRECTORY ENTRIES
- C) 4 DRIVES : 2.1MB : 256 DIRECTORY ENTRIES

12MB HARD DISK DRIVE

- A) 1 DRIVE : 8.33MB : 1024 DIRECTORY ENTRIES
- 1 DRIVE : 1.96MB : 256 DIRECTORY ENTRIES
- B) 2 DRIVES : 5.14MB : 512 DIRECTORY ENTRIES
- C) 4 DRIVES : 2.57MB : 256 DIRECTORY ENTRIES

16MB HARD DISK DRIVE

- A) 1 DRIVE : 8.33MB : 1024 DIRECTORY ENTRIES
- 1 DRIVE : 4.49MB : 512 DIRECTORY ENTRIES
- B) 2 DRIVES : 6.4MB : 512 DIRECTORY ENTRIES
- C) 4 DRIVES : 3.2MB : 256 DIRECTORY ENTRIES

19MB HARD DISK DRIVE

- A) 1 DRIVE : 8.33MB : 1024 DIRECTORY ENTRIES
- 1 DRIVE : 7.11MB : 512 DIRECTORY ENTRIES
- B) 2 DRIVES : 7.22MB : 512 DIRECTORY ENTRIES
- C) 4 DRIVES : 3.86MB : 256 DIRECTORY ENTRIES

Enter an "A", "B" or "C" to select a configuration. WINFMT5 configures the drive accordingly and then begins the checking process (checks for hard errors). It prints the message:

BEGIN CHECK-ESC TO ABORT

After the checking process is complete, the bad track table is displayed. The table shown below is an example.

```

:-----:
:                BAD TRACK TABLE                :
:-----:
: : 1)           : 2)           : 3)           : 4)           : 5)           :
: : 11)          : 12)          : 13)          : 14)          : 15)          :
: : 16)          : 17)          : 18)          : 19)          : 20)          :
: : 21)          : 22)          : 23)          : 24)          : 25)          :
: : 26)          : 27)          : 28)          : 29)          : 30)          :
: : 31)          : 32)          : 33)          : 34)          : 35)          :
: : 36)          : 37)          : 38)          : 39)          : 40)          :
:-----:
    
```

"T*****" (LOGICAL BAD TRACK NUMBER)
 "H*,C****" (HEAD, CYLINDER NUMBER)

ENTER ONE OF THE ABOVE OPTIONS OR <RETURN> TO ACCEPT: <CR>

The numbers preceding the right parentheses (1-40) are reserved tracks; that is, they are known to be good and may be substituted for bad tracks. To make such a substitution for a bad track identified by a track number, enter "T" followed by the bad track number and a carriage return. To make such a substitution for a track identified by a head and cylinder number, enter "H" followed by the head number; then enter "C" followed by the cylinder number. For example, if a bad track is identified by head 2, cylinder 41, then enter

H2, C41

and press carriage return. A reserved track is then automatically substituted for the bad track in the bad track table.

In the above display of the bad track table, no bad tracks are shown:

T68

then "68" would appear next to "1)" in the table, i.e.,

1) 68

When you have finished with the bad track table and have typed a return to accept it, the following message appears:

CHECK COMPLETED O.K.

PRESS <RETURN> TO DISPLAY MENU.

Enter a return to get back to the WINFMT5 menu.

When you are done, enter EX as your menu selection to return to the operating system.

6.0 CARTRIDGE TAPE SYSTEMS

6.1 Description

The cartridge tape drives supplied with many Dynabyte computers facilitate off-premise data base storage and shipping. They also provide an easy and inexpensive means of storing backup copies of data, or files that are infrequently used.

While data storage is the primary function of cartridge tapes, they can also be used for booting on Dynabyte computers. See Section 4 for a complete discussion of requirements and options for booting from tape.

The DTIP utility transfers data to and from cartridge tapes. By supporting both ambiguous and unambiguous file names, file types and user numbers, DTIP allows you to back up or restore a single file or an entire drive with equal ease, at a rate of 2 minutes/megabyte.

Data is organized on cartridge tape much as it is on a disk. Both storage media allow reference to a file by name, and do not require the user to know anything about the physical organization of data on the actual medium. Section 6.4 shows the actual tape record layout.

Data is written to tape in 8208-byte blocks, allowing a full 8K data record (8192 bytes) with a 16-byte file control block. This configuration allows 13.4 megabytes of storage on a 450-foot tape. Data is written sequentially on each of four tracks. As each track is filled, the tape is rewound and the next track selected. This is transparent to the user. If a tape is filled during a backup operation, a message requesting a new tape is issued. The backup continues when a new tape is inserted.

On the cartridge tape system, written data is dynamically reread and corrected automatically by the tape subroutines, reducing restore errors to 5 in 10¹⁰. It is normal for the cartridge tape unit to rewrite 5 to 10 blocks per track.

Often you will find a need for only a fraction of the total space on a tape for any one logical group of files to be saved. There may still be plenty of unused tape left. In order to make more efficient use of the medium, DTIP provides a "saveset" feature. This scheme allows you to save and restore multiple copies of files with the same name and type. Savesets are referred to by a two digit hexadecimal number within the range of 00-7F. The APPEND command automatically opens a new saveset with the saveset number equal to one more than the previous saveset number, unless manually overridden by the operator. The saveset numbers are used by four DTIP options: BACKUP, RESTORE, APPEND, and DIRECTORY.

6.1.1 Cartridge Tape Media

DTIP uses cartridge tapes with a capacity of up to 13.4 megabytes. As of this printing, the only cartridge tapes certified for use with the 6400 BPI technology drives are:

Verbatim TC-8450 (450')
3M-Scotch DC-300A (300')
3M-Scotch DC-300XL (450') (Lot numbers 087-xxx, 089-xxx, and 8105/0505
known to perform poorly and should not be
used.)

We strongly recommend that you buy certified media.

6.1.2 Testing the Cartridge Tape System

Once you have installed DTIP's hardware and software on your Dynabyte Computer System, you should test your unit by running DTIP. DTIP provides a full range of functions which will aid you in checking your newly installed system.

The INITIALIZATION (I) function of DTIP provides a very broad test. This command initializes tapes by writing a different data pattern at the beginning of each track. These patterns are then read to assure correct data was written to each. Once DTIP has determined that these tests were successful, it writes file marks to each of the tracks. This feature will be discussed fully below.

If any errors occur during this procedure, DTIP provides you with Disk Status and Interface Status codes. These ERRORS are defined in Section 6.2.

We suggest that you familiarize yourself by experimenting with the various DTIP operations including BACKUP, RESTORE and VERIFY, and recommend initial testing be done with noncritical data. Some of the DTIP commands are potentially dangerous unless you thoroughly understand their behavior. Experiment with a blank tape and a backup floppy. Then just try each of the commands, one at a time.

6.2 DTIP

DTIP (Dynabyte Tape Interchange Program) is the utility program used to transfer files between disk and tape. Among DTIP's features are:

- File level access to tape system
- Easy BACKUP and RESTORATION
- Tape DIRECTORY display command
- Tape file to disk file VERIFY command
- Easy to use menu-driven command format
- Backup and restore from any Dynabyte disk drive:

- 5.25" Floppy Disks
- 8" Single-Sided Floppy Disks
- 8" Double-Sided Floppy Disks
- 11 Megabyte Winchester Hard Disks
- 23 Megabyte Winchester Hard Disks
- 45 Megabyte Winchester Hard Disks

32 Megabyte Cartridge Module Hard Disks
64 Megabyte Cartridge Module Hard Disks
96 Megabyte Cartridge Module Hard Disks
6 Megabyte Mini Winchester Disks
10 Megabyte Mini Winchester Disks
12 Megabyte Mini Winchester Disks
16 Megabyte Mini Winchester Disks
19 Megabyte Mini Winchester Disks

DTIP is invoked by one of two calling methods:

DTIP or **DTIP D:FILENAME**

The first method is used to invoke DTIP in its standard form. The second invokes DTIP with its **AUTOMATIC BACKUP/RESTORE** feature enabled. Here 'FILENAME' specifies a submission file containing a series of file names to be processed by DTIP. This file must have file type 'TIP', though this need not be specified on invocation, and must be stored under the current user number. 'D' is an optional drive specification. If 'D' is omitted, the currently selected drive is assumed. This file specification method is a standard CP/M program invocation practice. The CP/M editor can be used to create the DTIP submit file. (See the discussion later in this section.)

When called, DTIP displays a menu of the possible options, prompts for your selection, performs the task, and returns to the menu. Return to the main program is achieved by typing an escape (ESC) during execution. If the program is aborted during a backup or restore, the data written is not necessarily valid and should be rewritten.

The following **DTIP COMMAND MENU** appears at the console:

CODE:	ACTION:
I	INITIALIZE TAPE
T	RETENSION TAPE
B	DISK TO TAPE BACKUP
R	TAPE TO DISK RESTORATION
A	DISK TO TAPE APPEND
V	FILE VERIFICATION
D	TAPE DIRECTORY
C	TAPE TO TAPE COPY
(ESC)	RETURN TO MONITOR

Note that you should not enter a carriage return after you type one of the options.

6.2.1 File Naming Conventions

File names are input after the prompt "FILE NAME:" or entered into the submit file using the following format:

D:NAME.TYPE[GU]

where:

D: is the optional designation of the source/destination disk drive, A - P. If "D:" is not specified, the program uses the currently selected disk.

NAME indicates the file name of 1 - 8 ASCII characters. The file name and file type on the destination are identical with the source.

The file name and/or file type may contain question marks. These act as 'wild cards' and any file whose name/type matches the non-question mark characters is selected. Further, using question marks causes the procedure to iterate, finding all files whose name matches the ambiguous name specified.

An asterisk (*) may be specified for the file name and/or file type field. This is equivalent to filling that field with question marks. Further, an asterisk can be specified as the user number to cause all users to be copied.

To RESTORE all files from a particular tape (or series of tapes) the file name 'ALL' may be specified. This file name is not supported by the BACKUP or APPEND routines. See RESTORE command description for details.

.TYPE is the optional designation of file type of 1 - 3 ASCII characters. If ".TYPE" is not specified, it is assumed to be all blanks (ASCII 20H).

[GU] is the optional designation of the user number. It may be a value from 0 -15, decimal. If "[GU]" is not specified, the currently selected user is assumed.

6.2.2 DTIP Options

I - INITIALIZE TAPE

You must use the I option to initialize a tape before writing data to it. The INITIALIZE TAPE routine writes two file marks at the start of the first three tracks on the tape. An 'EOT' sequence, consisting of a file mark, an end-of-tape record, and two file marks, are written to track four. These file marks indicate the end of data on each track, and are needed for compatibility with other tape handling facilities. As a self test this routine also writes a different record to each track following its FMK (File MarK) sequence. It then confirms each of these records after all tracks have been written. This test checks track separation and read/write capabilities. As this routine requires no file name specification, its operation remains the same under both standard and auto backup/restore modes.

T - RETENSION TAPE

The RETENSION TAPE command rewinds the tape, does a high speed search to the end of the tape, and again rewinds the tape. This procedure meets the manufacturers' recommendation for restoring tension to a worn tape. Processing a tape with this command can often alleviate read/write errors.

B - DISK TO TAPE BACKUP

You must initialize a tape with the I option before using DISK TO TAPE BACKUP. DISK TO TAPE BACKUP rewinds the tape and accepts a file name to process, either from the console (under standard operation) or from the submit file (under auto backup/restore operation). See file name input description. DISK TO TAPE BACKUP then searches for this file on the disk and copies it to the tape. Once it has completed this action, it returns to file name input mode to allow other files to be backed up. As no rewind occurs between file name inputs, the previously backed up data is not lost by specifying another file to backup. If the indicated file cannot be found on the disk, this condition is reported and the routine returns to file input mode. If only a carriage return is specified as the file name, an 'EOT' sequence (see INITIALIZE TAPE command) is written to tape to indicate end of data. The program returns to the menu display while the tape is rewound.

A - DISK TO TAPE APPEND

The DISK TO TAPE APPEND searches for the end of the data on the tape, and starts backup procedures at this point. In all other respects this routine is the same as the BACKUP routine.

The APPEND algorithm searches for the last track in use, starting with track 4. This system reduces the average time required to locate the end of data point on the tape.

Tapes must be initialized (I) prior to a backup if the APPEND is to be used. This is good common practice since the INITIALIZE (I) routine also performs a diagnostic of both the tape subsystem and the tape.

R - TAPE TO DISK RESTORATION

The TAPE TO DISK RESTORATION is similar to the BACKUP routine, except that files are read from the tape and written to the disk. Furthermore, in standard use, this procedure gives two additional prompts. Following file name selection, you are asked whether the search for the specified file should be conducted from the beginning of data on the tape. If you respond (Y), track one is selected and the tape is rewound prior to the file search. If (N) is specified, the search is conducted from the current tape position. Note that regardless of your choice, no rewind/track 1 selection is performed between multiple files accessed via an ambiguous file name specification. You are then asked if the source device should be ignored. If you respond "N", then only those tape files with a device code matching the disk drive in use, whether by default or specification, are considered. If you respond "Y", then the source device in the tape FCB is not considered at all. Under auto

backup/restore mode, all searches are relative to current position, and the source device code is considered.

When restoring multiple files via an ambiguous file name, RESTORE searches the entire tape for matches, terminating at the 'EOT' sequence. This means that, when run under auto mode, the submission file may contain at most one ambiguous file name. This must be the last entry in the file. To facilitate this restoration of multiple files, a file name of ALL is supported by this routine. If "ALL" is specified, the routine copies all files from the tape to the disk. These files are restored to the user and device specified in their file control blocks. See file name input description and notes for further information.

V - FILE VERIFICATION

The file verification routine verifies a disk file against its counterpart on tape. On entrance to this routine, you are prompted for the name of the file to verify. Your response can be a specific file name, or a name containing the wildcards "*" or "?". (We recommend that you precede the file name by a CONTROL-P to allow the displayed errors to be sent to the printer.) The procedure then searches for this file on the tape, and opens it on the disk. If the file is not present on either media, an appropriate error message is reported and the routine restarts. Once both files have been found, their contents are compared on a byte by byte basis. If any discrepancies are found, the extent, record number and byte number within the disk record (0 thru 7F hexadecimal) are displayed along with the byte value present in both the tape file and the disk file. If one file ends before the other, the remaining bytes in the other are displayed, with XX being displayed as the byte value in the terminated file. After all bytes have been compared the routine returns to file name input mode. The routine is terminated by entering a carriage return.

D - TAPE DIRECTORY

The tape directory lists the name, type, source drive, user number, and saveset for each file on the tape. This routine confirms that every block of data on the tape is readable.

C - TAPE TO TAPE COPY

The tape to tape copy initiates the tape control module's off-line copy procedure. Please note that a dual tape drive is needed for this procedure. Therefore, Dynabyte does not presently support this option.

6.2.3 Examples

The two following examples show how DTIP responds to input. The first example shows how to invoke DTIP, initialize a tape, and copy a file from disk to tape. The second example shows how to append files from disk to tape, obtain a tape directory, and restore a file from tape to disk.

Example 1

A>DTIP<CR>

***** WARNING! *****
THIS PROGRAM AFFECTS CPU CLOCK AND OTHER USERS
TYPE CNTRL C TO ABORT OR CR TO CONTINUE:<CR>

DYNABYTE TAPE INTERCHANGE PROGRAM - VERSION X.XX

CODE:	ACTION:
I	INITIALIZE TAPE
T	RETENSION TAPE
B	DISK TO TAPE BACKUP
R	TAPE TO DISK RESTORATION
A	DISK TO TAPE APPEND
V	FILE VERIFICATION
D	TAPE DIRECTORY
C	TAPE TO TAPE COPY
(ESC)	RETURN TO MONITOR

ACTION DESIRED:I

Note: Do not hit a carriage return after entering the option.

*** WARNING - TAPE INITIALIZATION IS DESTRUCTIVE ***
TYPE CR TO CONTINUE OR (ESC) TO ABORT:

DYNABYTE TAPE INTERCHANGE PROGRAM - VERSION X.XX

CODE:	ACTION:
I	INITIALIZE TAPE
T	RETENSION TAPE
B	DISK TO TAPE BACKUP
R	TAPE TO DISK RESTORATION
A	DISK TO TAPE APPEND
V	FILE VERIFICATION
D	TAPE DIRECTORY
C	TAPE TO TAPE COPY
(ESC)	RETURN TO MONITOR

ACTION DESIRED:B

*** WARNING - TAPE BACKUP IS DESTRUCTIVE ***
TYPE CR TO CONTINUE OR (ESC) TO ABORT:<CR>
ENTER SAVE SET CODE (CR FOR DEFAULT) :<CR>

FILE NAME (CR=DONE) :DTIP.COM<CR>
COPYING FROM DRIVE A, USER 0 TO SAVE SET 00:
DTIP .COM
FILE NAME (CR=DONE) :<CR>

DYNABYTE TAPE INTERCHANGE PROGRAM - VERSION X.XX

CODE:	ACTION:
I	INITIALIZE TAPE
T	RETENSION TAPE
B	DISK TO TAPE BACKUP
R	TAPE TO DISK RESTORATION
A	DISK TO TAPE APPEND
V	FILE VERIFICATION
D	TAPE DIRECTORY
C	TAPE TO TAPE COPY
(ESC)	RETURN TO MONITOR

ACTION DESIRED:<ESC>

A>

Example 2

A>DTIP<CR>

***** WARNING! *****
 THIS PROGRAM AFFECTS CPU CLOCK AND OTHER USERS
 TYPE CNTRL C TO ABORT OR CR TO CONTINUE:<CR>

DYNABYTE TAPE INTERCHANGE PROGRAM - VERSION X.XX

CODE:	ACTION:
I	INITIALIZE TAPE
T	RETENSION TAPE
B	DISK TO TAPE BACKUP
R	TAPE TO DISK RESTORATION
A	DISK TO TAPE APPEND
V	FILE VERIFICATION
D	TAPE DIRECTORY
C	TAPE TO TAPE COPY
(ESC)	RETURN TO MONITOR

ACTION DESIRED:A

SEARCHING FOR END OF DATA

TAPE POSITIONED AT END OF DATA

ENTER SAVE SET CODE (CR FOR DEFAULT) :<CR>

FILE NAME (CR=DONE) :*.TIP<CR>

COPYING FROM DRIVE A, USER 0 TO SAVE SET 01:

SAVEALL .TIP

MONTHLY .TIP

WEEKLY .TIP

DAILY .TIP

FILE NAME (CR=DONE) :<CR>

DYNABYTE TAPE INTERCHANGE PROGRAM - VERSION X.XX

```

CODE:      ACTION:
  Y        INITIALIZE TAPE
  T        RETENSION TAPE
  B        DISK TO TAPE BACKUP
  R        TAPE TO DISK RESTORATION
  A        DISK TO TAPE APPEND
  V        FILE VERIFICATION
  D        TAPE DIRECTORY
  C        TAPE TO TAPE COPY
(ESC)     RETURN TO MONITOR
    
```

ACTION DESIRED:D

TAPE DIRECTORY

NAME	TYPE	DRIVE	USER	SS
DTIP	.COM	A	0	00
SAVEALL	.TIP	A	0	01
MONTHLY	.TIP	A	0	01
WEEKLY	.TIP	A	0	01
DAILY	.TIP	A	0	01

STRIKE RETURN TO RESTART:<CR>

DYNABYTE TAPE INTERCHANGE PROGRAM - VERSION X.XX

```

CODE:      ACTION:
  I        INITIALIZE TAPE
  T        RETENSION TAPE
  B        DISK TO TAPE BACKUP
  R        TAPE TO DISK RESTORATION
  A        DISK TO TAPE APPEND
  V        FILE VERIFICATION
  D        TAPE DIRECTORY
  C        TAPE TO TAPE COPY
(ESC)     RETURN TO MONITOR
    
```

ACTION DESIRED:R

TAPE TO DISK RESTORATION

ENTER SAVE SET CODE (CR FOR DEFAULT):01<CR>

FILE NAME (CR=DONE):DAILY.TIP

SEARCH FROM START OF DATA (Y/N)?Y

IGNORE SOURCE CODE DEVICE AS IT IS WRITTEN ON TAPE (Y/N)?Y

COPYING:

NAME	TYPE	DRIVE	USER	SS
DAILY	.TIP	A	0	01

FILE NAME (CR=DONE):<CR>

DYNABYTE TAPE INTERCHANGE PROGRAM - VERSION X.X

CODE:	ACTION:
I	INITIALIZE TAPE
T	RETENSION TAPE
B	DISK TO TAPE BACKUP
R	TAPE TO DISK RESTORATION
A	DISK TO TAPE APPEND
V	FILE VERIFICATION
D	TAPE DIRECTORY
C	TAPE TO TAPE COPY
(ESC)	RETURN TO MONITOR

ACTION DESIRED:<ESC>

6.2.4 Creating DTIP Submit Files

The DTIP submit file facility allows you to create command files containing DTIP commands. The SUBMIT function of DTIP processes these commands as if the user entered them from the keyboard. DTIP command files must have the file type .TIP.

The submit function of DTIP is invoked by entering DTIP with the SUBMIT file name as the command line argument.

If the first command in a control file is **AUTO**, the DTIP program bypasses all menu questions and proceeds into the APPEND mode. It increments the saveset number, saves the required files, then exits to the operating system (if no errors were encountered). NOTE: Tapes must be initialized (I) before they may be used to backup any data, even in the AUTO mode.

The following example demonstrates how to make a SUBMIT file with the standard CP/M editor, ED. This file "SAVEALL.TIP" uses the append feature of DTIP. At the end of each day you can insert a tape and issue the command "DTIP SAVEALL <CR>". This is how to make that file.

```
A>ED SAVEALL.TIP<CR>
*I<CR>
AUTO<CR>
B:*. *<CR>
E:*.ASM[G*]<CR>
E:*.COM[G*]<CR>
A:*.DAT<CR>
<CR>
*<control>Z
*EXIT<CR>
A>
```

6.2.5 Error Messages

If DTIP cannot respond to your instructions, it considers the situation an error. This may happen because DTIP can't understand an illegal filename or a non-existent menu choice. In these cases, DTIP displays an explanatory error message, and allows you to re-enter the information.

DTIP has three interfaces -- to the operator; to the operating system (for file operations) and to the hardware (interface card, tape drive, cartridge). Errors can occur at each of these interfaces. This section displays each type of error. At any error you can return to the operating system by hitting the escape key.

User Interface Errors

FILE NAME BAD, REENTER

UNEXPECTED END OF DATA

TAPE COMMUNICATIONS, SYNTAX REJECT WITHIN DTIP

TAPE ABORT WITH ATTEMPT

TAPE ABORT WITHOUT ATTEMPT

TAPE IS WRITE PROTECTED

FILE NOT FOUND

DISK FULL

Tape Abort Errors

If the error received was an 'ABORT' from the tape drive, DTIP also displays the tape sub-error code. These codes and their meanings are as follows. There are no codes 04 and 05.

NOTE: Be sure to keep the tape head clean. This will eliminate many needless errors. See also the discussion on PREVENTIVE MAINTENANCE below.

<u>CODE:</u>	<u>MEANING AND SUGGESTED SOLUTION:</u>
00	SELECTED DRIVE HAS EXECUTED AUTO-REWIND SINCE PREVIOUS INIT OR REWIND CMD. -- RETURN TO MASTER MENU OR RESTART TIP TO CLEAR ERROR
01	WRITE OPERATION REQUEST TO A WRITE PROTECTED DRIVE -- REPLACE TAPE WITH AN UNPROTECTED ONE (OR REMOVE WRITE PROTECTION FROM PRESENT TAPE) AND REISSUE COMMAND

- 02 COMMAND ISSUED TO NON-PRESENT DRIVE OR DRIVE WITH
 CARTRIDGE REMOVED --
 BE SURE THAT CARTRIDGE IS PROPERLY SEATED IN THE DRIVE
 AND REISSUE COMMAND. IF THIS ERROR PERSISTS, IT IS A
 HARDWARE PROBLEM
- 03 DRIVE FAILED TO RESPOND TO THE REQUESTED COMMAND --
 THIS IS PROBABLY A HARDWARE ERROR
- 06 FILE MARK VERIFICATION ERROR AFTER WRITING IT --
 RE-INITIALIZE TAPE AND TRY AGAIN. IF THIS PERSISTS,
 TRY A DIFFERENT TAPE
- 07 TRANSPORT ABORT PRIOR TO COMMAND COMPLETION --
 PROBABLE HARDWARE PROBLEM
- 08 READ FAIL - MISSING DATA OR FMK --
 PROBABLE BAD TAPE OR HARDWARE ERROR
- 09 READ FAIL - SHORT RECORD ERROR --
 AS PER 08
- 10 READ FAIL - SHORT RECORD ERROR --
 AS PER 08
 (or)
 Note: Many times this error is caused by operating a
 DTIP subsystem on other than a 4-Mhz, Z-80A or one
 with wait states enabled.
- 11 READ FAIL - PARITY ERROR --
 AS PER 08
- 12 WRITE FAIL - R-A-W VERIFY ERROR --
 AS PER 08
- 13 WRITE FAIL - READ DATA NOT DETECTED PRIOR TO RECORD
 WRITE OPERATION COMPLETION --
 AS PER 08
- 14 READ FAIL - FILE MARK DETECTED --
 PROBABLE HARDWARE, SOFTWARE, OR TAPE ERROR.

6.3 Preventive Maintenance

There are a few simple rules to follow while handling the magnetic tape media:

1. Be certain that no tape cartridge is in the drive while powering up or powering down the tape drive or the computer system.
2. Never remove the tape cartridge while any kind of tape transfer is underway.
3. Store your cartridges in a cool dry place when not in operation. Permanent damage may be done to the capstan if a tape is left in the unit!

Three components of the tape unit require periodic maintenance in order to insure overall system reliability. The cleaning removes contaminants from the tape unit which come in direct contact with the tape. The cleaning assures that there will be adequate contact between the tape head and the tape.

A dirty tape head can cause data dropouts and error conditions during read and write operations. It is recommended that you clean your tape head frequently with a non-corrosive, non-residue cleaning agent such as isopropyl alcohol. Apply the alcohol with a cotton swab and be sure to wipe off any excess and allow the head to dry before using the unit.

CAUTION: Spray type head cleaners are not recommended.

Never clean the tape head with a hard object. This will result in head damage.

The tape cleaner removes loose foreign material from the tape before it comes in contact with the tape head. This foreign material accumulates in and around the tape. The tape cleaner should be cleaned with the same frequency as the tape head.

To clean the tape cleaner, insert a folded piece of paper in the bottom of the cleaner and lift up. This will lift out all foreign material. Compressed air or a brush may be used. It is also recommended that occasionally you use the same cotton swab and alcohol method suggested in the tape head cleaning section.

CAUTION: Never clean the tape cleaner with a hard object. If the tape cleaner should become chipped it could scratch the tape head and cause permanent damage.

The recommended method for cleaning the capstan is the same one recommended for the tape head: alcohol and a cotton swab.

Record Format

PREAMBLE	Minimum 40 "zero" bits	
SEQUENCE	and a single "one" bit	
PRE-SYNC BITS	3 "zero" bits	
SYNC BYTE =	FFH	
RECORD TYPE BYTE	Data = 22H(cr) FMK = 55H	
ATA BYTE 1 ATA BYTE 2 ATA BYTE "n"	Omitted if "File Mark"	Calculation Basis for LRCC byte
LRCC BYTE	(even parity)	
RECORD TYPE =	22H	
POSTAMBLE	single "one" bit &	
SEQUENCE	minimum 40 "zero" bits	
INTER-RECORD-GAP	Minimum 1.2" Nominal 1.25"	

NOTE: All bytes consist of 8 data bits (LSB first) + 1 vertical parity bit (even)

6.4.3 DS-100, DZ-80B I/O Connections

PIN #	SIGNAL	FROM	COMMENTS
2	SLD-	Drive	Selected
4	RDY-	Drive	Ready
6	WND-	Drive	Write Enabled
8	FLG-	Drive	Flag
10	LPS-	Drive	Load Point Sensed
12	FUP-	Drive	File Unprotected
14	BSY-	Drive	Busy
16	EWS-	Drive	Early Warning Sensed
18	RWD-	Controller	Rewind
20	REV-	Controller	Reverse
22	FWD-	Controller	Forward
24	HSP-	Controller	High Speed
26	WEN-	Controller	Write Enable
28	SL1-	Controller	Unit Select bit 0
30	SL2-	Controller	Unit Select bit 1
32	SL4-	Controller	Unit Select bit 2
34	SLG-	Controller	Select Gate
36	RNZ-	Drive	Read NRZ Data
38	RDS-	Drive	Read Data Strobe
40	DAD-	Drive	Data Detected
42	WDE-	Controller	Write Data Enabled
44	WNZ-	Controller	Write NRZ Data
46	TR2-	Controller	Track Select bit 1
48	WDS-	Drive	Write Data Strobe
50	TRL-	Controller	Track Select bit 0

- NOTE: 1) All odd numbered pins are returns.
 2) All signals are ACTIVE HIGH.

7.0 COPYING DATA

Several of the DOS 3 and CP/M utility programs are designed for copying data. Each program has specific capabilities that make it the appropriate program for use under a given set of circumstances. The following paragraphs will help you choose the utility to do a specific copying task.

PIP is the general-purpose CP/M program for copying files from one disk to another or from disk to printer. It can copy one file, several files, or all the files in one user area. PIP cannot copy the loader from a system disk. DTIP must be used to transfer files to cartridge tape. See your Digital Research CP/M manual for a complete discussion of PIP.

DYNAGEN is a highly specialized DOS 3 program that copies the loader and boot files from a system disk to another disk. It thereby creates a new boot disk. After DYNAGEN is run, PIP can be used to transfer other files to the new disk. See Section 3.1 for a complete description of DYNAGEN.

DTIP is used to copy files from disk to cartridge tape and to restore from tape to disk. It is used primarily to create backup copies of data. It can copy or restore one file, many file types, or all files in a user area. DTIP is discussed in Section 6.2.

BACKUP is also used to create backup copies of data on disk only. Files copied from hard disk to floppy disk cannot be accessed until they are restored to hard disk. Additionally, BACKUP cannot append files; it clears the destination disk before beginning the copy. BACKUP can copy files of any size, and can copy files in all user areas of a disk. BACKUP is discussed below in Section 7.1.

HCOPI is another specialized program, used only on systems that have Cartridge Module hard disk drives. It copies one entire platter to any other platter. HCOPI is discussed below in Section 7.2.

7.1 BACKUP

The BACKUP utility is used to create backup copies of data on hard or floppy disk. BACKUP can selectively copy one or more files in one user area (file by file mode) or can copy entire logical disks (track by track mode). You can use BACKUP to copy between the following pairs of devices:

- From hard disk to floppy disk set:
track by track or file by file
- From floppy disk set to hard disk:
track by track or file by file (this copy is allowed
only to restore a hard to floppy backup)
- From floppy disk to floppy disk:
track by track only
- From hard disk to hard disk:
track by track only

When copying between like devices (floppy to floppy or hard to hard), the devices must be identical. The following drive types and sizes can currently be used by the BACKUP program.

Floppy Drives

8" SINGLE-SIDED SINGLE-DENSITY FLOPPY
8" SINGLE-SIDED DOUBLE-DENSITY FLOPPY
8" DOUBLE-SIDED SINGLE-DENSITY FLOPPY
8" DOUBLE-SIDED DOUBLE-DENSITY FLOPPY
5.25" SINGLE-SIDED DOUBLE-DENSITY FLOPPY
5.25" DOUBLE-SIDED DOUBLE-DENSITY FLOPPY

Hard Disk Drives

8.3 MB FUJITSU WINCHESTER
1.2 MB FUJITSU WINCHESTER
4.7 MB FUJITSU WINCHESTER
2.5 MB FUJITSU WINCHESTER
7.0 MB MICROPOLIS WINCHESTER
6.5 MB CARTRIDGE MODULE
8.3 MB COMPUTER MEMORIES, INC. WINCHESTER
4.4 MB COMPUTER MEMORIES, INC. WINCHESTER
6.4 MB COMPUTER MEMORIES, INC. WINCHESTER
3.2 MB COMPUTER MEMORIES, INC. WINCHESTER
4.2 MB COMPUTER MEMORIES, INC. WINCHESTER
2.1 MB COMPUTER MEMORIES, INC. WINCHESTER
4.9 MB COMPUTER MEMORIES, INC. WINCHESTER
2.4 MB COMPUTER MEMORIES, INC. WINCHESTER
5.1 MB COMPUTER MEMORIES, INC. WINCHESTER
2.6 MB COMPUTER MEMORIES, INC. WINCHESTER
2.0 MB COMPUTER MEMORIES, INC. WINCHESTER
7.1 MB COMPUTER MEMORIES, INC. WINCHESTER
7.2 MB COMPUTER MEMORIES, INC. WINCHESTER
3.9 MB COMPUTER MEMORIES, INC. WINCHESTER
4.9 MB TANDON WINCHESTER
2.4 MB TANDON WINCHESTER
7.4 MB TANDON WINCHESTER
3.7 MB TANDON WINCHESTER

BACKUP, as its name implies, was designed primarily for backing up large blocks of data so that a copy is available if the original data is somehow lost or damaged. Large files that are updated frequently can (and should) be backed up on a regular basis.

BACKUP can also be used to store data that is infrequently accessed. These files could be copied, using BACKUP, from the hard disk to floppies, and the originals on the hard disk erased. This could free up a great deal of storage space on the hard disk. When the backed up files are needed in the future, they could be restored onto the hard disk.

7.1.1 BACKUP versus PIP

The CP/M utility PIP is also used to copy files. PIP and BACKUP differ in the following ways:

- PIP can copy files between any two drives on your system, regardless of size or type. BACKUP is restricted to certain combinations of devices.
- PIP creates a CP/M standard floppy disk that can be accessed by any CP/M utility. BACKUP, when used from hard disk to floppy, creates non-standard floppy disks that can be accessed only by BACKUP to restore the data to hard disk.
- PIP cannot copy a file larger than 1 MB. BACKUP, on the other hand, can copy files of any size.
- PIP transfers a file to any empty space on the destination disk but does not affect other files on that disk. BACKUP erases the destination disk before it writes out the files. Thus, PIP can append files, but BACKUP cannot.
- PIP can only copy files in the current user's area, whereas BACKUP, in track by track mode, can copy all user areas on a disk.
- If PIP is used to copy a floppy system disk, it must be used with DYNAGEN since PIP cannot copy the loader (the outer two tracks). BACKUP, in track by track mode, copies the entire floppy system disk, including the loader.

This section first explains how to invoke BACKUP and transfer files from hard disk to floppy disk, since that is the most frequently used option. Then the two other BACKUP options, hard disk to hard disk and floppy disk to floppy disk, are explained. Last in this section is a list and description of error messages.

7.1.2 Invoking BACKUP

You access BACKUP by typing "BACKUP" at the system-level prompt. You may invoke BACKUP in one of two ways. Typing "BACKUP", followed by a carriage return, will put you in an interactive BACKUP mode that queries you for information to perform the backup. You may also perform BACKUP with a single command line, as described below.

The interactive BACKUP mode presents you with a list of three options and asks for your choice:

A>BACKUP<CR>

***** DYNABYTE BACKUP UTILITY VER. X.X RUNNING UNDER CP/M *****

F = FILE BY FILE COPY

T = TRACK BY TRACK COPY

X = EXIT TO OPERATING SYSTEM

The file by file mode allows you to select some or all files in your current user area for backup. This mode can be used only for copying from hard disk to floppy disk, or restoring from floppy disk to hard disk.

The track by track mode copies an entire logical disk (all user areas and files) on a track by track basis, including all empty tracks. This mode can be used for copying from hard disk to a floppy disk set, from hard disk to hard disk, or from floppy disk to floppy disk.

The BACKUP program can also be invoked by a single command line that includes the options listed above. The form is

BACKUP /SD/FILENAME.TYP

where S is the source drive, D is the destination drive, and FILENAME.TYP is the name of the file to be copied. The slash before "S" is required. The element /FILENAME.TYP is optional. If it is included, BACKUP assumes file by file mode. If it is not included, BACKUP assumes track by track mode. Note that the slash is required if this element is included.

7.1.3 Copying from Hard Disk to a Floppy Disk Set

Copying from hard disk to a floppy disk set can be done in either file by file or track by track mode. The next subsection discusses the advantages of each.

When copying files from hard disk to floppy disk, you will usually be working with several floppy disks, called a floppy disk set, for one BACKUP job. Before you can back up files on to the floppy disks, the floppy disks must be formatted, and all floppies for one backup job must be formatted identically. Since BACKUP cannot be interrupted once it starts, we recommend that you format as many floppy disks as you will need to store all the data you plan to back up. You may use the same set of floppies each time you back up the same group of files — preferably on a regular schedule.

The floppy disks that are created by hard disk to floppy disk BACKUP are "nonstandard" disks in that they do not have a standard file directory. On a floppy disk created with track by track mode, the directory command displays the following information:

: DYNABYTE : BACKUP : 02/06/82 : DISK#01

This display tells you that the floppy disk is a DYNABYTE BACKUP disk. It gives you the archive date that you entered when you created the disk, and the number of this disk in the current backup set.

File by file mode prints the same information, plus one additional directory entry:

: FILEONLY

This entry tells you that the disk was created in file by file mode and must be restored in the same mode.

The floppy disks created by hard disk to floppy disk BACKUP are also write protected. They cannot be read by any utility or command except BACKUP. Therefore, the files thus copied cannot be accessed until they have been restored by BACKUP.

It is very important to keep all the floppy disks for one backup session together and properly numbered, because BACKUP must restore the disks in the exact order in which they were created. BACKUP does not allow you to begin a restore operation with any disk but the first, and must process each disk in numerical order. If one disk in a set is lost or misplaced, the others are useless.

7.1.3.1 Choosing Track or File Mode

Whether you select track by track or file by file mode to backup your data will depend on your situation. You should weigh the relative value to you of compacted data storage, the speed of copying and subsequent recovery, and number of files and user areas to be copied. Each mode offers some advantages.

If you are copying all the files, and if the source disk is close to full, track by track transfer takes less floppy disk space than file by file. File by file stores more information about the individual files than does track by track. Also, file by file transfer does not start a new file if close to the end of a track. Instead, it goes to the top of a new track, so all tracks may not be completely full. On the other hand, if there is considerable empty space on the source disk, file by file transfer will take less floppy space, as it does not copy any of the empty space.

Since track by track mode copies all user areas, it is much faster than file by file if you want to copy several user areas. To copy another user area in file by file mode, you must exit BACKUP and switch to the new user area at system level.

The primary advantage of file by file backup is that it allows you to restore one or more selected files without restoring the whole set. Track by track transfers must be restored in their entirety.

7.1.3.2 File by File Copy

If you select the file by file mode, BACKUP next asks you for the file name. Both "*" and "?" are allowed as wildcard characters so that you can transfer groups of files with common name elements. If you want to transfer all files in your user area, simply type "*.*".

WHICH BACKUP MODE ? <CR>

FILENAME ("*" & "?" ARE ALLOWED) (FILENAME.TYP)?

BACKUP next asks you for the source drive. In file by file mode, the source must be a hard disk drive.

SOURCE DRIVE (A - P)?

BACKUP next asks for the destination which, in file by file mode, must be a floppy disk drive.

DESTINATION DRIVE (A - P)?

BACKUP then displays the type of hardware on each drive, and also the number of directory entries. For example:

SOURCE = 4.7 MB FUJITSU DIR ENTRIES = 0512
DESTINATION = 8" SS DD FLOPPY DIR ENTRIES = 0128

You are then prompted for the archive date. You can enter any date you want, and it will be stored as a directory entry on your backup floppies.

ARCHIVE DATE (MM/DD/YY)?

After you have entered the date, BACKUP tells you to insert the first floppy in your set and type the carriage return to continue. For example, if you had specified drive E as the destination drive, BACKUP would print

INSERT FLOPPY DISK #01 IN DRIVE E

HIT RETURN TO CONTINUE....

As the files are transferred, BACKUP displays one line for each file at the terminal, and continuously increments the number of records until the file is completely transferred. It then prints the new file name, again incrementing the number of records until the file is finished. The completed file list for one backup session might look like this:

```
FPYLDR .COM 00075 RECORDS
FUJLDR .COM 00046 RECORDS
MWLDR .COM 00093 RECORDS
MINILDR .COM 00017 RECORDS
```

If all the files to be transferred will not fit on one floppy disk, BACKUP fills the first floppy, then pauses and requests the second disk. For example:

INSERT FLOPPY DISK #02 IN DRIVE E

HIT RETURN TO CONTINUE....

After you insert the second disk and type the carriage return, BACKUP continues copying files as before, printing the name and record count for each file as it copies. If a third disk is needed, BACKUP again pauses and asks

you to change disks. It continues this way until all files have been transferred. BACKUP then tells you that the backup is complete and asks you to hit a carriage return.

BACKUP COMPLETE

HIT RETURN TO CONTINUE....

You are again presented with the three options that began the program, and you can continue to backup up files or exit as you choose.

Again, the backup disks created by this process are write protected. They cannot be read by any CP/M or Dynabyte utility except BACKUP. Therefore, the files thus copied cannot be accessed until they are restored to hard disk by BACKUP.

7.1.3.3 Restoring File by File, Floppy Disk Set to Hard Disk

The same BACKUP program is used to restore the files to hard disk. You can restore all the files at once, or can select specific files. However, even if you are restoring just one file, the BACKUP program must process a set of floppy disks in numerical order.

After you call BACKUP, the same options are presented. For backup floppy disks created in file by file mode, you must select file by file mode, F, to restore to hard disk.

***** DYNABYTE BACKUP UTILITY VER. X.X RUNNING UNDER CP/M *****

**F = FILE BY FILE COPY
T = TRACK BY TRACK COPY
X = EXIT TO OPERATING SYSTEM**

WHICH BACKUP MODE ? F<CR>

You are again asked for file names, and again are allowed to use the wildcard characters "*" and "?" to select the file(s) to be restored.

FILENAME ("*" & "?" ARE ALLOWED) (FILENAME.TYP)?

When you are restoring files, the floppy disk must be specified as the source drive, and any hard disk can be specified as the destination drive. Again, BACKUP confirms your choices by displaying, for the two drives, their type and number of directory entries. For example, to restore files from drive E to drive D, the interaction would be:

SOURCE DRIVE (A - P) ? E<CR>

DESTINATION DRIVE (A - P) ? D<CR>

**SOURCE = 8" SS DD FLOPPY DIR ENTRIES = 0005
DESTINATION = 4.7 MB FUJITSU DIR ENTRIES = 0512**

When BACKUP restores files to hard disk, it does not overwrite any data on the hard disk. If the disk should contain a file having the same name and file type as one you are restoring, the file extension of the file already on the hard disk will be changed to "BAK".

BACKUP then asks you to insert the first floppy disk.

INSERT FLOPPY DISK #01 IN DRIVE E

HIT RETURN TO CONTINUE....

If you are restoring all files, BACKUP copies all the files from disk #01 back on to the hard disk, then requests the second floppy disk, and so on until all disks are restored.

If you are restoring selected files, BACKUP searches disk #01, copying all files that match the filename.typ you have specified, then requests the next disk. The disks are searched in numerical order until all requested files have been restored.

7.1.3.4 Track by Track Copy

Track by track backup from hard disk to floppy disks is very similar to the procedure just described for file by file backup. After you have formatted several floppy disks and called BACKUP, you are presented with the same list of options.

***** DYNABYTE BACKUP UTILITY VER. X.X RUNNING UNDER CP/M *****

**F = FILE BY FILE COPY
T = TRACK BY TRACK COPY
X = EXIT TO OPERATING SYSTEM**

When you are asked

WHICH BACKUP MODE ?

you specify T for track to track copy. You are then asked for the source drive

SOURCE DRIVE (A - P) ?

and you specify the drive of the logical hard disk drive you want to back up. The next question

DESTINATION DRIVE (A - P) ?

should be answered with the floppy disk drive that will be used for your backup copies. BACKUP next asks for the archive date:

ARCHIVE DATE (MM/DD/YY) ?

You can enter any date you want, and it will be stored as a directory entry on your backup floppies.

After displaying the device types and number of directory entries, BACKUP tells you the size of the buffer in bytes, then how many tracks will fit into the buffer. The more tracks the buffer will accommodate, the faster the transfer will be. For example:

```

SOURCE = 4.7 MB FUJITSU    DIR ENTRIES = 0512
DESTINATION = 8" SS DD FLOPPY  DIR ENTRIES = 0128

INTERNAL RAM MEMORY BUFFER SIZE = 42737 BYTES
# OF SOURCE DISK TRACKS BUFFERED = 06

```

One line prints at the terminal,

```

READING TRACK # 0000    WRITING TRACK #0000

```

and the track numbers iterate until the floppy disk is full. BACKUP asks you to insert the second floppy disk and continues thus until the whole logical hard disk has been copied. When BACKUP is done, it prints the message

```

BACKUP COMPLETE

```

```

HIT RETURN TO CONTINUE....

```

After hitting the carriage return, you can begin another BACKUP job or exit.

7.1.3.5 Restoring Track by Track, Floppy Disk Set to Hard Disk

You can restore from floppy to any logical hard disk of the same size as the logical hard disk from which you originally did the backup. The backup mode must be T, the source must be your floppy drive, and the destination must be the hard disk. Note that all files on the hard disk are erased before the restore copying begins.

The following example assumes restore from floppies on drive E to hard disk D.

```

*** DYNABYTE BACKUP UTILITY VER. X.X RUNNING UNDER CP/M ***

```

```

F = FILE BY FILE COPY
T = TRACK BY TRACK COPY
X = EXIT TO OPERATING SYSTEM

```

```

WHICH BACKUP MODE ? T<CR>

```

```

SOURCE DRIVE (A - P) ? E<CR>
DESTINATION DRIVE (A - P) ? D<CR>

```

```

SOURCE = 8" SS DD FLOPPY    DIR ENTRIES = 0004
DESTINATION = 4.7 MB FUJITSU  DIR ENTRIES = 0512

```

```

INTERNAL RAM MEMORY BUFFER SIZE = 42737 BYTES
# OF SOURCE DISK TRACKS BUFFERED = 06

```

```

READING TRACK # 00000    WRITING TRACK # 00000

```

As BACKUP reads the tracks, the numbers in the line above are iterated. The floppy disks are requested in sequence until all tracks are restored.

7.1.4 Copying between Like Devices

Copying from hard disk to hard disk and from floppy disk to floppy disk can only be done in track by track mode.

Both modes transfer the entire contents of the source disk, including directory entries, creating an exact copy of the source disk. Therefore, the files on the backup disks can be accessed directly by file name, just as they can on the source disk.

7.1.4.1 Floppy Disk to Floppy Disk Copy

For floppy to floppy backup, the source and destination disks must be of the same type and size and must be formatted identically, with one exception. The number of directory entries need not be the same.

The following example assumes source drive A and destination drive B. Both are floppy disk drives.

***** DYNABYTE BACKUP UTILITY VER. X.X RUNNING UNDER CP/M *****

**F = FILE BY FILE COPY
T = TRACK BY TRACK COPY
X = EXIT TO OPERATING SYSTEM**

WHICH BACKUP MODE ? T<CR>

**SOURCE DRIVE (A - P) ? A<CR>
DESTINATION DRIVE (A - P) ? B<CR>**

**SOURCE = 8" SS DD FLOPPY DIR ENTRIES = 0128
DESTINATION = 8" SS DD FLOPPY DIR ENTRIES = 0064**

**INTERNAL RAM MEMORY BUFFER SIZE = 42737 BYTES
OF SOURCE DISK TRACKS BUFFERED = 06**

INSERT FLOPPY DISK #01 IN DRIVE B

**HIT RETURN TO CONTINUE....
BACKUP IN PROGRESS.**

READING TRACK # 00000 WRITING TRACK # 00000

BACKUP COMPLETE

HIT RETURN TO CONTINUE....

Since only one floppy disk is being backed up, the copy is complete when the destination disk is full. At this point, the destination disk is an exact

copy of the source disk, and a directory command on both disks will produce identical results. The files could be accessed from either floppy disk, with the same results.

7.1.4.2 Hard Disk to Hard Disk Copy

For hard disk to hard disk copies, the two hard disks must be identical, the logical drives must be the same size, and the number of directory entries must be the same.

Hard disk to hard disk backup generally is used if a set of files are to be extensively altered but it is likely that one or more of the files will be needed in its original condition. Programmers are likely to use this mode during program development, since recovery is much faster than from a floppy disk.

In the following example, the source drive is A and the destination drive is D.

```
*** DYNABYTE BACKUP UTILITY VER. X.X RUNNING UNDER CP/M ***
```

```
F = FILE BY FILE COPY
T = TRACK BY TRACK COPY
X = EXIT TO OPERATING SYSTEM
```

```
WHICH BACKUP MODE ? T<CR>
```

```
SOURCE DRIVE (A - P) ? A<CR>
DESTINATION DRIVE (A - P) ? D<CR>
```

```
      SOURCE = 4.7 MB FUJITSU      DIR ENTRIES = 0512
DESTINATION = 4.7 MB FUJITSU      DIR ENTRIES = 0512
```

```
INTERNAL RAM MEMORY BUFFER SIZE = 42737 BYTES
# OF SOURCE DISK TRACKS BUFFERED = 06
```

BACKUP prints one line at the terminal,

```
READING TRACK # 00000      WRITING TRACK # 00000
```

and iterates the track number as it reads and writes them. When completed, it prints the message

```
BACKUP COMPLETE
```

```
HIT RETURN TO CONTINUE.
```

At this point, disk A and disk D are identical, and the files can be accessed from either drive. To restore the data from drive D to drive A, the interaction would be identical to that above, except that the source drive would be D and the destination drive would be A.

7.1.5 Error Messages

BACKUP protects your data from damage if you incorrectly use the program. If you make a mistake, BACKUP will refuse your instruction and issue an error message. A summary and explanation of BACKUP error messages follow:

1. ***** BACKUP ABORTED, COPY NOT WRITTEN *****

An error occurred which caused backup to abort the copy process. The copy operation was NOT completed and must be restarted. Try to determine the cause of the abort and correct it before attempting to run the BACKUP utility again. This error message is usually accompanied by another error message to define the error in more detail.

2. ***** ERROR, WRONG OPERATING SYSTEM VERSION ***
BACKUP ONLY WORKS WITH CP/M 2.2 OR MP/M 1.1**

The operating system you are using does not support BACKUP. Only CP/M version 2.2, MP/M version 1.1 or MP/M version 2.1 are supported by the current version of BACKUP. You could get this error by running BACKUP under CP/M 1.4 or on a non-Dynabyte computer system.

3. ***** ERROR, CANNOT OPEN DISK QUEUE ***
NO OTHER USERS MAY ACCESS THE DISK DRIVES WHILE RUNNING BACKUP.**

When BACKUP is run in an MP/M environment it MUST be run off-line. This means that no other users can be accessing any of the disk drives in the system. This error occurs when another user is attempting to access a disk drive in the system and BACKUP is running. Determine which user is accessing a disk drive and insure that BACKUP is the only process running on the MP/M system.

4. ***** SELECT DISK ERROR ***
CURRENTLY CONFIGURED SYSTEM DOES NOT INCLUDE SPECIFIED DISK DRIVE**

This error occurs if you instruct BACKUP to use a source or destination drive that does not exist or that has not been installed on the current system. Only drives A through P are valid drive designations in CP/M and MP/M. Determine which drives you will be using for the BACKUP operation. Then insure that these drives exist and are installed in the current operating system. Restart BACKUP and enter the proper drive designations.

5. ***** SPECIFIED FILE NOT ON SOURCE DISK*****

The source drive does not contain the specified file. This error is usually caused by misspelling the file name or by specifying the wrong source disk drive. Another possible cause for this error may be that the file has a "SYS" system attribute. Only "DIR" directory attribute files can be read with BACKUP in the file by file mode. Determine the problem that caused the error, correct it and restart BACKUP.

6. * BAD SECTOR FOUND ON SOURCE DRIVE *****

This error is caused by a physical media error on the source drive. If the source drive is a floppy disk, the disk is probably damaged in some way. There is no way to recover a floppy disk set if one of the disks is damaged. You should use the original floppy disk set to recover the data.

If the source drive is a hard disk, there is probably a defect on the hard disk media or in the hard disk hardware or controller. There is no way to recover a hard disk with a media defect. Use the PIP utility to move as much data as possible off of the hard disk and reformat the hard disk.

7. * BAD SECTOR FOUND ON DESTINATION DRIVE *****

This error is caused by a physical media error on the destination drive. If the destination drive is a floppy disk, the disk is probably damaged in some way. Insert a different, formatted diskette and try the backup operation again.

If the destination drive is a hard disk, there is probably a defect on the hard disk media or in the hard disk hardware or controller. Reformat the hard disk and make sure that the bad track table is properly configured. Then try the backup operation again.

8. * BACKUP ABORTED, CANNOT READ SOURCE DISK *****

This error results from the same conditions as error message #6. Follow the recovery actions described under error #6 above.

9. * BEGIN RETRY *****

BACKUP displays this message upon retrying a backup operation. When you substitute a new floppy disk for a damaged one, BACKUP informs you that it is attempting the operation again.

10. * INCORRECT DISK FORMAT ***
REPLACE OR REFORMAT DESTINATION DISK**

This error occurs when the formats do not match between the destination disk and the source disk during a track by track backup. The destination and source disks MUST be the same density and have the same number of sides. This error can also occur on a hard disk to floppy backup operation if one of the diskettes in the set of floppies is formatted differently from the others in the set. Format the destination floppy disk or floppy disk set to match the source set and restart the BACKUP operation.

11. * THIS DISK WAS NOT CREATED BY BACKUP PROGRAM *****

This error occurs when a restore operation is attempted on a floppy disk that was not created by BACKUP. To be restored by BACKUP, a disk must have been created by BACKUP. Locate the correct floppy disk or floppy disk set and restart the BACKUP operation.

12. * TWO DIFFERENT SIZE FLOPPIES ARE NOT ALLOWED FOR BACKUPS *****

This error occurs when you attempt a track by track BACKUP between floppy disks with different formats. The two disks MUST be formatted with the same number of sides (single or double) and the same density (single or double). The number of directory entries may differ between the floppy disks, however. If you receive this error message, format a floppy disk to match the source disk and restart the BACKUP operation.

13. * TWO DIFFERENT SIZE HARD DISKS ARE NOT ALLOWED FOR BACKUPS *****

This error occurs when you attempt a track by track backup between two unmatched logical hard disks. The two hard disks MUST be exactly the same size and type. If you want to perform track by track copies between two logical hard disk drives, always format your hard disk using a configuration option that divides the hard disk into equal size logical disks. You may also get this error by specifying the wrong source or destination drive.

14. * YOU HAVE INSERTED THE WRONG DISK # ***
YOU HAVE INSERTED DISK #XX IN DRIVE X**

This error occurs during a restore operation from a floppy disk set to the hard disk if you have inserted one of the disks in the wrong sequence. Each disk in the set MUST be inserted in the order that it was created. Insert the correct diskette in the drive and hit the return key.

15. * THERE ARE NO FILES ON THE SOURCE DISK THAT
MATCH THE SPECIFIED FILENAME *****

BACKUP displays this message when it cannot find a specified file on the source drive. You may have misspelled the file name or specified the wrong source disk drive. Another cause may be that the specified file has a "SYS" system attribute. Only "DIR" directory attribute files can be read with BACKUP in the file by file mode. Determine the problem that caused the error, correct it and restart BACKUP.

16. * DISK FULL *****

This error may occur during a file by file copy from a floppy disk set to a hard disk. BACKUP is informing you that the hard disk does not have enough storage space for the new file(s) and cannot restore any more files from the floppy disk set. Either erase some extraneous files from the hard disk and restart the BACKUP operation or restart the BACKUP operation and specify another hard disk drive as the destination drive.

17. * DISK DIRECTORY FULL *****

This error may occur during a file by file copy from a floppy disk set to a hard disk. BACKUP is informing you that the hard disk directory is full and cannot restore any more files from the floppy disk set.

Either erase some extraneous files from the hard disk and restart the BACKUP operation or restart the BACKUP operation and restore to another hard disk drive.

18. ***** COMMAND ERROR *****

FILE BY FILE COPY IS ONLY ALLOWED FROM;

**FLOPPY TO HARD DISK
OR
HARD DISK TO FLOPPY**

This error is caused by attempting to use file by file backup mode from a floppy disk to another floppy disk or from a hard disk to another hard disk. As the message indicates, a file by file backup can only be performed from a floppy disk to a hard disk or from a hard disk to a floppy disk. Restart BACKUP and specify source and destination drives that follow these rules.

19. ***** COMMAND ERROR *****

INVOKE BACKUP BY:

**BACKUP /SD (S=SOURCE, D=DESTINATION) TRACK BY TRACK
BACKUP /SD/FILENAME.TYP FILE BY FILE**

BACKUP has the capability of being interactive and asking the user questions to determine which mode, source drive and destination drive to use. It also has the capability of being used in a batch mode type of operation and having all of its operating parameters specified on the command line along with the "BACKUP" command itself. This error occurs when the command line parameters did not follow the correct convention that the BACKUP program is expecting. Restart BACKUP with the correct command line parameters or simply enter "BACKUP" alone on the command line and BACKUP will query you for the appropriate response.

7.2 HCOPY

HCOPY is the utility used to copy one Cartridge Module hard disk platter to another hard disk platter. The 32 megabyte cartridge module hard disk drive contains two platters. One platter is fixed and the other is removable. The 64 megabyte CMD unit has one removable platter and three fixed platters. The 96 megabyte CMD unit also has one removable platter and five fixed platters. HCOPY allows you to copy from any of the fixed platters to the removable platter or the other way round. HCOPY can also be used to copy from one fixed platter to another fixed platter. The removable platter is usually used to backup the fixed platters. This way, you can back-up your fixed platter every night and store the removable platter away in a safe place. If, the next day, you crash your fixed platter, you can recover by running HCOPY and copying from the removable platter you stored away back onto the fixed platter that was crashed.

There are logical drives on each hard disk platter, one logical drive on the outer tracks and another on the inner tracks. HCOPY copies one platter at a

time, so it copies two logical drives at a time. You cannot use HCOPI to copy only one logical drive (use PIP to do that). So be careful when you run HCOPI that you do not inadvertently erase a day's work.

HCOPI should always be run off-line. This means that no other users on the system should be doing anything! A good way to insure this is to reboot the system with a disk configured for only one terminal. You can then run HCOPI from this single terminal and be assured that no other users interfere. This is very important. HCOPI will allow you to perform a copy while other users are still on-line, but erratic performance may result.

To run HCOPI simply type:

A>HCOPI<CR>

HCOPI then signs on:

DYNABYTE HARD DISK COPY UTILITY

VERSION X.XX - FOR DOS 3.XX

ENTER **R - FOR REMOVAL PLATTER**
 F1 - FOR FIXED PLATTER # 1
 F2 - FOR FIXED PLATTER # 2
 F3 - FOR FIXED PLATTER # 3
 F4 - FOR FIXED PLATTER # 4
 F5 - FOR FIXED PLATTER # 5

SOURCE ?

You should now select the platter you wish to copy from. This is the platter that will be read. You should push the write protect button on the front panel of the hard disk drive for the platter you are going to read from. (Don't push the button for the other platter or HCOPI won't be able to write to it). This prevents you from destroying your original should you enter the wrong choice.

After you enter the source platter, HCOPI asks for the destination platter:

DESTINATION ?

Once again you have a choice of platters. You must select the platter that you did not use above (HCOPI does not permit you to copy a platter onto itself!). After you have specified the platter to write to, HCOPI asks you to type a key to begin:

HIT ESCAPE TO REBOOT, OR ANY OTHER KEY TO BEGIN

You may hit the escape key if you do not wish to go on with the copy procedure (if you entered the platters in the wrong order, for instance). You should type any other key to begin the copy procedure.

As HCOPI copies each track from one platter to the other, it prints the track number on the console in hex notation. There are 808 (0-807) tracks on each

platter in a 32 megabyte drive. This is 327 in hex. The track numbers are displayed until the number 327 appears:

000 001 002 003 004 005 006 007 008 009 00A 00B 00C 00D 00E ...

After all the tracks have been copied, the verify procedure begins. HCOPIY tells you that the copy is complete and that it is beginning the verify pass.

HCOPIY reads each sector from the platter that it wrote to and verifies that it can be read. As each track is verified, its track number is displayed on the console in hex notation:

COPY COMPLETE, BEGIN VERIFY PASS...

000 001 002 003 004 005 006 007 008 009 00A 00B 00C 00D 00E ...

After the verify operation is complete, HCOPIY displays a completion message and returns to the operating system:

OPERATION COMPLETE.

A>

Any errors during the actual copy operation or the verify operation are reported by one of the following messages:

**DRIVE SELECT ERROR
TRACK SEEK ERROR
INVALID HEAD#
DESTINATION MAY NOT BE SAME AS SOURCE
TRACK MISMATCH
HEAD MISMATCH
SECTOR MISMATCH
CHECKSUM ERROR**

If any of these errors appear during the copy operation, then you should try to run the copy procedure again. If it still fails, try to run HFORMAT on the destination platter to clear any bad sectors that may be on it. If it still fails, then you have hardware problems and should have your computer serviced.

The HCOPIY program can also be invoked by a single command line that includes the source and destination platters. For example:

A>HCOPIY /F1R<CR>

Simply enter a space and a slash after the HCOPIY command. After the slash you may enter a F1, F2, F3, F4, F5, or R. The first designation after the slash is the source platter and the second is the destination platter. The above example would copy from the fixed platter number one to the removable platter. /RF1 would copy from the removable platter to fixed platter number one.

If the slash option appears on the command line, then HCOPIY asks no questions. It simply begins immediately with the copy process.

8.0 PRINTERS, CONSOLES, AND MODEMS

The printers, consoles, and modems attached to your computer are communication devices for getting data in and out. This section explains how to connect them and the software that controls access to them.

Section 8.1, CONSOLE AND PRINTER CONNECTIONS, explains the pin assignments and configurations required by a number of different printers and consoles.

Section 8.2, MULTIPLE PRINTERS, discusses the software utilities that install printers and consoles, assign printers to consoles, and change those assignments when necessary.

Section 8.3, AUTO-ANSWER MODEMS, covers both the physical installation of modems and the software used to access them.

8.1 Console and Printer Connections

DOS 3 allows a variety of terminals and printers to be connected to a Dynabyte computer. For the devices to "talk" to the computer, they must be properly plugged into the back panel. For every port that is supported by DOS 3, there is either a connector on the back panel of the computer or on a cable that extends out of the computer.

There are several ways that a device can be supported by DOS 3. This section explains how to connect some standard devices to a Dynabyte computer. To boot DOS 3, you must have a console on CPU2 (CPU serial port #2). (You may have a printer on CPU1, but it is not required.) You must also have the console configured for 9600 baud, inhibited parity, one start bit, and either one or two stop bits. If the terminal connected to CPU2 is configured any other way, you will not be able to boot DOS 3.

There are two connector patterns supported by Dynabyte. One is for serial RS232 (or current-loop) devices; the other is for parallel devices. Table 8.1 shows the pin assignments for each type. Make sure that the device you connect to a port has the proper pin connections.

The software I/O drivers for CPU1 and CPU2 use the CTS (clear to send) signal to insure that a data buffer in an output device is ready to accept data. CTS is monitored automatically in hardware on all of the octaport ports.

The CTS signal is an EIA (RS232) compatible signal that functions as follows. If the printer or output device is ready to receive data, then CTS must be held at the positive EIA level or open circuited (no connection). If the printer or output device is not ready to receive data, then CTS must be held at the negative EIA level. CTS is then used to synchronize transfers to the data buffer of the output device.

Table 8.1 shows pin configurations for a number of devices.

Table 8.1 Pin Assignments for Serial and Parallel Ports

A. SERIAL PORTS

PIN #	FUNCTION
2	DATA IN (EIA)
3	DATA OUT (EIA)
5	TERMINAL READY (EIA)
7	GND (Ground)

B. PARALLEL PORT

PIN #	FUNCTION
1	DATA IN 0
2	DATA IN 1
3	DATA IN 2
4	DATA IN 3
5	DATA IN 4
6	DATA IN 5
7	DATA IN 6
8	DATA IN 7
9	GND (Ground)
10	NOT IN READY
11	SENSE
12	NOT FLAG 1 OUT
13	NOT PORT INT
14	DATA OUT 0
15	DATA OUT 1
16	DATA OUT 2
17	DATA OUT 3
18	DATA OUT 4
19	DATA OUT 5
20	DATA OUT 6
21	DATA OUT 7
22	GND (Ground)
23	NOT OUT BUSY
24	OUT STROBE
25	NOT FLAG 2 OUT

NOTE: All parallel connections are TTL level signals.

Table 8.2 Pin Configurations for Standard Devices

Note: The following table shows the required pin connections between the serial and parallel ports on a Dynabyte computer and a number of common printers and terminals. Some of the printers require jumpers on the DB25 pin connectors on the printer side. These are for Clear to Send and Carrier Detect signals that are not needed for connection to a Dynabyte computer. Do not jumper these pins together on the Dynabyte side of the connector — jumper them on the cable only on the printer side.

A. TERMINALS

1. IBM 3101

IBM Pin #	DYNABYTE Pin #
2	2
3	3
+ 4	
5	
6 +	
7	7
+ 8	
20 +	

2. All Other Terminals

Terminal Pin #	DYNABYTE Pin #
2	2
3	3
7	7

Table 8.2 Pin Configurations For Standard Devices (cont.)

B. PRINTERS

1. Centronics 701, 779, 703, Epson MX-80

Centronics Pin #	DYNABYTE Pin #
1	24
2	14
3	15
4	16
5	17
6	18
7	19
8	20
9	21
11	23
17	22

8.2 Pin Configurations for Standard Devices (cont.)

2. Centronics 737

Centronics Pin #	DYNABYTE Pin #
1	24
3	14
5	15
7	16
9	17
11	18
13	19
15	20
17	21
21	23
31	22

3. Diablo 1600 Series and 630 Series

Diablo Pin #	DYNABYTE Pin #
2	2
3	3
+ 4	
+ 6	
7	7
20	5

For Diablo 1600 Series Printers: Inside the printer, a black wire goes from pin 20 of I/O to the HBRO-4 board (controller) pin 3. This is CTS logic high. Remove this wire from pin 3 and plug it into pin 2 (logic low). The Diablo 630 has an HBRO-5 board. Jumper Pin 5 to Pin 6 on the HBRO-5 board.

Table 8.2 Pin Configurations for Standard Devices (cont.)

4. Diablo Hyterm

Diablo Pin #	DYNABYTE Pin #
2	2
3	3
+ 5	
+ 6	
7	7
+20	

5. NEC Spinwriter, Models 5510 and 7710

NEC Spinwriter Pin#	DYNABYTE Pin #
3	3
+ 4	
+ 5	
+ 6	
7	7
- 8	
19	5
+20	

5510 - Inside the front panel of the NEC is a DIP switch assembly. Switch 5 should be disabled (down).

7710 - There is one group of eight unmarked switches located on the front panel underneath the smoked plastic cover. Switch 4 must be up. Switch 2 and 8 must be down. Inside the printer will be one data board called the JHW Board. There is a group of eight switches on this board. All must be down.

Table 8.2 Pin Configurations for Standard Devices (cont.)

6. Qume, Sprint 9

Qume Pin #	DYNABYTE Pin #
3	3
4	5
+ 6	
7	7
8	
+ 9	

7. Tally

Tally Pin #	DYNABYTE Pin #
3	3
+ 11	
19	5
+ 7	
14	7

Note: Tally pin numbers 11 and 19 are connected to each other and to Dynabyte pin 5. Similarly, Tally pin numbers 7 and 14 are connected to each other and to Dynabyte pin 7.

Table 8.2 Pin Configurations for Standard Devices (cont.)

8. **TI810**

TI810 Pin #	DYNABYTE Pin #
3	3
+ 6	
7	7
- 8	
+ 9	
11	5

9. **TI820**

TI820 Pin #	DYNABYTE Pin #
3	3
+ 6	
7	7
- 8	
11	5
+ 20	

8.2 Multiple Printers

DOS 3 supports up to four printers. Each of the printers can be a completely different type. For instance, you could have several very fast line printers for quick printouts and also several high quality character printers for word processing, all going at the same time.

Dynabyte has written a utility to handle the switching needed to print on several different printers. Most software written to run under CP/M is designed to communicate to a single printer. This makes it necessary to provide a means of switching between printers on the system.

This section explains exactly how to install multiple printers on the system and how to use them.

8.2.1 Installation

Multiple printers are installed using the DYNASYS utility, which configures a new DOS 3 system disk. During the DYNASYS process, you are prompted for the physical ports to assign to each console and printer. As mentioned in section 3, you have many physical ports from which to choose this assignment:

**DYNASYS VERSION X.XX FOR DYNABYTE DOS 3
CP/M 2.2 SYSTEM REGENERATION UTILITY**

CHARACTER I/O DEVICE ASSIGNMENTS

CPU1 - CPU2 = CPU SERIAL PORTS	CPUP = CPU PARALLEL PORT
OCT1 - OCT16 = OCTAPORT PORTS	MOD1 - MOD8 = AUTO-ANSWER MODEM
USR1 - USR8 = USER I/O DRIVERS	

CONSOLE	LIST	READER	PUNCH
C0) 0 = CPU2	L0) 0 = CPU1	R0) 0 = CPU1	P0) 0 = CPU1
C1) 1 =	L1) 1 =	R1) 1 =	P1) 1 =
C2) 2 =	L2) 2 =	R2) 2 =	P2) 2 =
C3) 3 =	L3) 3 =	R3) 3 =	P3) 3 =

When DYNASYS prompts you for a printer assignment, it prints the printer number that it is asking for:

L0) 0 = ?

You may then enter any of the mnemonics above to assign a specific port as #0. For instance, to make CPU1 (CPU serial port #1) printer #0:

L0) 0 = ? CPU1<CR>

After you enter the mnemonic and a carriage return, DYNASYS makes the assignment and prompts you for the physical port to assign to printer #1. You may simply hit the return key if you have no more printers to assign or you may continue for up to four printers.

8.2.2 PRINTON

The PRINTON utility is used to select one of the printers as the current output device. You may choose any one of the devices that were assigned as printers during DYNASYS. A printer must be selected before it can receive data from the computer. To select a particular printer, enter the command PRINTON followed by a space and the number of the printer you want to use:

```
A>PRINTON 1<CR>
```

```
PRINTER ASSIGNMENT UTILITY REV X.X - FOR DOS 3.XX
```

```
PRINTER #0 CHANGED TO PRINTER #1
```

```
A>
```

In the above example, PRINTON informs you that it has run, and that printer number 1 is now the currently assigned printer.

If you specify an invalid printer number, you will receive an error message:

```
A>PRINTON 8<CR>
```

```
PRINTER ASSIGNMENT UTILITY REV X.X - FOR DOS 3.XX
```

```
INVALID PRINTER NUMBER
```

```
A>
```

If you specify the currently selected printer, PRINTON will simply reselect this printer:

```
A>PRINTON 1<CR>
```

```
PRINTER ASSIGNMENT UTILITY REV X.X - FOR DOS 3.XX
```

```
PRINTER #1 CHANGED TO PRINTER #1
```

```
A>
```

After you have successfully run PRINTON, enter a Control-P if you want the same characters that are displayed on the console screen to also be sent to the printer, as a test of the new assignment.

8.3 CONSOLE

The CONSOLE utility is used to select one of the terminals as the current I/O device. You may choose any one of the devices that were assigned as consoles during DYNASYS. To select a particular console (or terminal), enter the command CONSOLE followed by a space and the number of the console you want to use:

A>CONSOLE 1<CR>

CONSOLE ASSIGNMENT UTILITY REV X.XX - FOR DOS 3.XX

CONSOLE #0 CHANGED TO CONSOLE #1

A>

In the above example, CONSOLE informs you that it has run, and that console number 1 is now the currently selected console. As a result, the "A>" prompt will now appear on console number 1. Although the operating system will now direct its command prompts to console number 1, control may be easily changed to another console.

If you specify an invalid console number, you will receive an error message:

A>CONSOLE 8<CR>

CONSOLE ASSIGNMENT UTILITY REV X.XX - FOR DOS 3.XX

INVALID CONSOLE NUMBER

A>

If you specify the currently selected console, CONSOLE will simply reselect this console:

A>CONSOLE 1<CR>

CONSOLE ASSIGNMENT UTILITY REV X.XX - FOR DOS 3.XX

CONSOLE #1 CHANGED TO CONSOLE #1

A>

8.4 Auto-Answer Modems

A MODEM enables you to communicate with your computer from remote sites via a telephone line by providing the interface between digital and analog systems. Your computer sends and receives digital signals. The telephone transmission system handles analog signals. MODULATION is the process whereby a computer's digital signal is changed so that it may be more efficiently transmitted through the telephone lines' analog transmission medium. DEMODULATION is simply the inverse of modulation: converting the analog signal back to its original digital form. The term MODEM reflects its function as MODulator-DEMulator.

In addition to supporting the common acoustic coupler modem, DOS 3 also supports the AUTO-ANSWER MODEM. The auto-answer modem is installed directly in the computer and is connected to a telephone line. It automatically "answers the phone" when a remote user with an acoustic coupler modem calls the telephone number assigned to the computer. An auto-answer modem accepts incoming calls from remote terminal users by continually monitoring the modem port for incoming signals. Without the auto-answer feature, someone at the computer site must manually answer the computer's phone line.

DOS 3 supports two types of auto-answer modems:

1. MICROMODEM 100

manufacturer:
 Hayes Micro Computer Products
 5835 Peachtree Corners East
 Norcross, GA 30092
 (404) 449-8791

2. MM-103 MODEM

manufacturer:
 Potomac Micro-Magic, Inc.
 5201 Leesburg Pike
 Suite #604
 Falls Church, VA 22041
 (703) 379-9660

These modems are discussed individually in Sections 8.4.1.1 and 8.4.1.2 respectively.

8.4.1 Installation

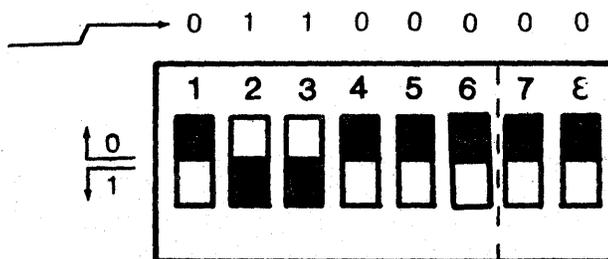
Each of the two DOS 3-supported auto-answer modem boards may be installed in any slot on the Dynabyte S-100 bus. Up to 8 modem boards can be installed but only one may be in use at a time. Read the technical manual for your modem board before installing the board into your system. Beyond the instructions in the manual, the only adjustment you have to make to integrate the modem board into a Dynabyte system is to reset the I/O ADDRESS. When you first receive them, the PMMI and D.C. Hayes modem boards will be configured for I/O port 80 hex. However, this port is reserved by a fully implemented DOS 3 system and therefore must be reset before installing the modem board.

The I/O address is set by the DIP (Dual In-line Package) switch. On the D.C. Hayes modem board, the DIP switch is the green switch box on the right side of the board. On the PMMI modem board it is the red switch box located in the middle of the board. You should set the position of the switch to correspond to the modem port that is assigned to a logical device during DYNASYS (see Section 3.2). For example, MOD1 should be set for 60H; MOD2 should be set for 64H, etc. The following table summarizes the appropriate DIP switch settings for each modem port. There are only 6 bit settings; even though there are 8 bit positions on the D.C. HAYES modem, the last 2 are reserved for special functions.

DIP SWITCH SETTINGS

Port	Setting	Bit Values
MOD1	60H	0110 0000
MOD2	64H	0110 0100
MOD3	68H	0110 1000
MOD4	6CH	0110 1100
MOD5	70H	0111 0000
MOD6	74H	0111 0100
MOD7	78H	0111 1000
MOD8	7CH	0111 1100

DIP SWITCH



It makes no difference whether you first physically install the modem board and then use DYNASYS or vice versa. To make your modem board operational, you

must use DYNASYS to assign a MOD (modem) port and to assign characteristics to the modem. Remember that your DYNASYS assignments are not in effect until you reboot your computer system. Any component of a new system configuration that is established with DYNASYS is not reflected until your computer is booted under that system.

8.4.1.1 D.C. Hayes

One of the two auto-answer modem boards that DOS 3 supports is the D.C. Hayes' model Micromodem 100. Be sure to thoroughly read the D.C. Hayes manual before installing the modem board. The only additional setup requirement is to reset the I/O ADDRESS. Read the discussion on Installation for instructions on correctly setting the switches for the I/O ADDRESS.

As with the PMMI modem, many of the characteristics of the D.C. Hayes modem are set by the software. Using the DYNASYS program described in Section 3.2, you may assign certain functional characteristics to the operation of your D.C. Hayes modem. If "DC HAYES" is entered as the MODEM TYPE, you are automatically prompted to assign the modem's characteristics.

The only difference in assigning characteristics to the D.C. Hayes and the PMMI modems is that baud rates for the PMMI modem are completely software-assigned. If the baud rate for the D.C. Hayes modem is other than the standard baud rate of 300, then "NS" (for Non-Standard) is specified and the baud rate is established with the hardware.

The following table summarizes, for each characteristic, the possible responses.

BAUD RATES:	300	NS		
STOP BITS:	1	2		
PARITY:	ODD	EVEN	NONE	
WORD LENGTH:	5	6	7	8
PASSWORD:	Any 8 or less characters			

We recommend that, unless you are certain to be using only one type of acoustic coupler modem in conjunction with your modem board, you set the BAUD RATE to 300. This will ensure that your modem board is compatible with the baud rates of all modems. One is the most common setting for STOP BITS. If PARITY is specified as ODD or EVEN, you should set your WORD LENGTH to 7; otherwise, you would normally set WORD LENGTH to 8.

The D.C. Hayes modem board is available from either a vendor in your area or directly from D.C. Hayes Associates, Inc.

8.4.1.2 PMMI

As mentioned already, DOS 3 also supports the auto-answer modem, model MM-103 which is manufactured by Potomac Micro-Magic, Inc. (PMMI). Read the PMMI manual before installing the modem board. The only additional setup requirement is to reset the I/O ADDRESS. Read the discussion on Installation for instruction on correctly setting the switches for the I/O ADDRESS. Many of the characteristics of the PMMI modem board are assigned by the software.

Using the DYNASYS program described in Section 3.2, you may specify certain functional characteristics to the operation of your PMMI modem. The MODEM TYPE is established as "PMMI". You will then be prompted to assign further characteristics to the modem's operation. The following table summarizes these parameters and their possible values.

BAUD RATES:	110	150	300	600
STOP BITS:	1	2		
PARITY:	ODD	EVEN	NONE	
WORD LENGTH:	5	6	7	8
PASSWORD:	Any 8 or less characters			

We recommend that, unless you are certain to be using only one type of acoustic coupler modem in conjunction with your modem board, you set the BAUD RATE to 300. This will ensure that your modem board is compatible with the baud rates of all modems. One is the most common setting for STOP BITS. If PARITY is specified as ODD or EVEN, you should set your WORD LENGTH to 7; otherwise, you would normally set WORD LENGTH to 8.

The PMMI modem board is available from either a vendor in your area or from PMMI directly.

8.4.2 Modem Usage

DOS 3 communicates with the installed modem board just as it does with any other terminal, with one exception. Everytime DOS 3 inputs from or outputs to the modem, it checks the status of the phone line. If no one is calling the computer, DOS 3 simply places that terminal output in a suspended state until the phone rings. When the phone does ring, DOS 3 answers the phone and sends out a carrier tone. Upon hearing this carrier tone, the calling party should place the phone handset into the acoustic modem and pause for a few seconds to allow the two modems to establish connection. One or two carriage returns should be typed to "clear" out the modem board. DOS 3 then queries:

ENTER # OF NULLS?

You should then type the appropriate number of null characters to be sent after each carriage return. The function of a null character is to consume time while the print head returns to the beginning of the line. If your console is a CRT, enter "0". Most printers and slow teletype devices need from 3 to 7 null characters to allow the carriage enough time to return to the beginning of the line before printing subsequent characters. To determine exactly the optimum null character value for your device, you may experiment. Start with 10 and decrease this value until the point at which characters are printed as the carriage is moving to the return position at the beginning of the line. Your setting should be one above this point.

Upon accepting a value for null characters, DOS 3 prompts you for the password:

ENTER PASSWORD :

You have five tries to enter the correct password (i.e., the password established with DYNASYS). To be accepted, the password must be entered

exactly as it was during DYNASYS. The password characters will not be echoed at your terminal to ensure password confidentiality. If your password entry is incorrect, DOS 3 responds:

++ INCORRECT ++

If five incorrect responses are entered, the phone hookup is disconnected and you must redial. Upon receiving the correct password, DOS 3 signs you on by responding:

SIGNING ON ...

A>

You are now able to do ANYTHING from your remote terminal that you could from a terminal connected directly to the computer.

To sign-off, simply hang up your remote phone anytime you have a system level prompt: A>. DOS 3 automatically disconnects and awaits the next caller.

9.0 ADVANCED FEATURES

This section provides instructions for the experienced computer user to modify and customize DOS 3 for a particular application.

Section 9.1, User Installed I/O Drivers, explains the procedure for installing a non-Dynabyte I/O driver. DOS 3 will support up to eight user-installed I/O drivers. DOS 3 directly supports the CPU serial and parallel ports, the octaport 8-port serial board, and an auto-answer modem.

You can install the non-Dynabyte driver to:

- Interface with non-Dynabyte equipment
- Add line protocol (ETX, DCL/DC3, ACK/NAK, etc.) or otherwise modify an existing driver
- Customize output for a particular printer (i.e., to add form feed capability to a printer)

This section explains how to write an I/O driver, how to install the driver into the DOS 3, and how to use it.

Section 9.2, COLD AND WARM BOOTS, defines the cold and warm boot procedures, and describes how they can be tailored to a particular need. It includes pre-listing the logged devices and using chain modules to put applications program "up and running" upon booting. Finally, COLD MESSAGE DISPLAY, Section 9.2.3, describes how to create a customized display in lieu of the standard DYNABYTE DOS 3.XX sign-on message.

9.1 User-Installed I/O Drivers

DOS 3 supports up to eight user-installed I/O drivers. DOS 3 directly supports several types of I/O devices -- the CPU serial and parallel ports, the Octaport 8 port serial board and an auto-answer modem. However, sometimes you need to communicate with some other type of I/O device or simply modify one of the existing drivers.

Eight of these user-defined I/O devices may be used in a DOS 3 system. This section will explain exactly how to write an I/O driver for a user device, how to install the driver in DOS 3, and how to use it.

To write a user I/O driver, you MUST understand Z80 assembly language programming. Writing and installing an I/O driver is not a difficult process, but it does require some basic knowledge and experience. Dynabyte does not recommend that a novice install user I/O drivers.

On the distribution disk is a file called "USERIO.MAC". This is the source code file for two I/O drivers that have already been written for the Microsoft M80 assembler. Some minor modifications will be needed to assemble this file under a different Z80 assembler.

The USERIO.MAC file is "ORG"ed at 0000 hex. Actually, there is no "ORG" at all, so the Microsoft M80 assembler will produce a relocatable "REL" type of file. The Digital Research Linking utility, "LINK", can then use this "REL" file to produce a "SPR" type of file. The "SPR" file is in page relocatable form, which is then loaded by DYNASYS and merged into the CPM.SYS file. The process to produce the "SPR" file will be explained in more detail later in this chapter.

The first code assembled in the USERIO.MAC file is a jump table. This table contains 6 jump vectors to routines located later in the file:

```
JP  CINIT      ;INITIALIZE ALL USER I/O DEVICES
JP  INSTAT     ;POLL USER INPUT DEVICE
JP  OTSTAT     ;POLL USER OUTPUT DEVICE
JP  INPUT      ;INPUT FROM USER DEVICE
JP  OUTPUT     ;OUTPUT DATA TO USER DEVICE
```

The first jump vector, "CINIT", should jump to a routine that will be called only once during system initialization. This routine should contain all the code needed to initialize any I/O device, such as setting up baud rates, UART parameters or board configurations. If your devices require no initialization, then this jump vector should point to a RET instruction.

The CINIT routine is the first routine loaded after the jump vector table. Consult Appendix C for a listing of CINIT as part of USERIO.MAC. On entry, Register pair DE points to the start of the system data page.

The four other jump vectors are used to communicate to the actual user I/O devices. Each of these four jump vectors have certain entry and exit parameters:

ENTRY:

```
D REGISTER = USER DRIVER NUMBER (1-8)
C REGISTER = CHARACTER TO OUTPUT (OUTPUT ONLY)
```

EXIT:

```
A REGISTER = 0/0FFH FLAG FOR READY/NOT READY
              (INSTAT/OTSTAT ONLY)
A REGISTER = CHARACTER INPUT (INPUT ONLY)
```

On entry to each of the four jump vectors, the D register will contain the number of the user I/O device for the call. By examining the D register and then branching to the appropriate routine, you can write routines to handle up to eight user I/O devices. The D register will contain the appropriate value for each of the four jump vectors.

The C register will contain the character to send to the output device when the OUTPUT jump vector is called. The C register has no meaning for the other jump vectors.

When the routine returns control back to the operating system (by executing a RET instruction), it must pass certain parameters back to inform the operating system about the condition of the device. The OUTPUT routine does not need to return a parameter. It simply performs the output function.

The INSTAT and OTSTAT routines MUST return the A register equal to either 0 or FF hex. If the routine returns a 0, then DOS 3 will assume the device is still busy and not ready to receive or send a character yet. If the routine returns a FF hex in the A register, then DOS 3 will assume the device IS ready and call the appropriate routine (either INPUT or OUTPUT) to send or receive the character.

The INPUT routine must read the character from the device and return the character in the A register.

In the USERIO.MAC file on the distribution disk you will find two user I/O drivers that have already been written. These two drivers will communicate with the two CPU serial ports. There are already drivers for these two ports written for DOS 3. These are called "CPU1O.SPR." You can use the already written drivers by using the CPU1 and CPU2 mnemonics inside of DYNASYS for console, printer, reader, or punch assignments. The drivers have simply been rewritten in the USERIO.MAC file as an example for writing user I/O drivers. You may also use the drivers to modify the routines used to communicate with the two CPU serial ports. To add an ETX ACK protocol for instance. These two user I/O drivers can be assigned in DYNASYS just as the ones above by entering the mnemonics USR1 and USR2 for CPU1 and CPU2 respectively. You will find that both the USR and CPU mnemonics will function the same.

The user should study this existing source code file, USERIO.MAC, to determine how to write his own I/O drivers. Watch for the treatment of the D register particularly. This register is used to vector between the different device handlers.

The first routine, after the jump vector table, should be the initialize routine. This routine is labeled, "CINIT", in the USERIO.MAC file. In this routine should be the routines necessary to set up your I/O device. In the USERIO.MAC file, there is an example that configures CPU1 and CPU2 baud rates from parameters stored in System Data Page. If your device needs any initialization, then the routines to perform this should be included here. This may include setting up the correct baud rate, setting UART parameters, or initializing RAM storage locations. This routine is called once and only once, immediately after the user I/O drivers are installed.

The next four routines that need to be written are the actual device handling routines. As mentioned above, there are four routines to perform four different functions:

1. INSTAT - To poll the input device for input ready
2. OTSTAT - To poll the output device for output ready
3. INPUT - To input the character from the device
4. OUTPUT - To output the character to the device

The INSTAT routine will be called every time DOS 3 needs to get a character from the input device. The device number that it wants to poll will be in the D register as a value 1 through 8. If you are simply writing a driver for only one device, then you can ignore the D register, otherwise you must examine the D register to see which device to poll for the input.

The INSTAT routine must simply "POLL" the input device and return the status of it. It must not actually input the character from the device (INPUT does

that). If you must read the character from the device in order to poll it, then store the character away to be retrieved by the INPUT routine. The INSTAT routine must return the status of the device in the A register. It should send back a 0 in the A register if the device has not received a character. It should return a FF hex in the A register if the device does have a character. The routine should not "loop" waiting for the device, it MUST return immediately after being called with the status of the device.

The OTSTAT routine is very similiar to the INSTAT routine above, except it should poll for the status of the OUTPUT device. Once again, the device number to be polled is in the D register. If you are simply writing a driver for only one device, then you can ignore the D register. Like the routine above, the OTSTAT routine should return a 0 or FF in the A register to return the status of the output device. If the device is ready to output another character, then a FF hex should be returned in the A register. If the device is not ready to output another character, then a 0 should be returned. Once again, this routine should NOT "loop" waiting for the device to become ready, but should return with the status immediately after being called.

The next two routines, INPUT and OUTPUT, perform the actual character output and input to the devices.

The INPUT routine should input the character from the device and return with the character in the A register. The INPUT routine should NOT examine the status of the device. The status will already have been checked by the operating system. DOS 3 will ONLY call the INPUT routine after the INSTAT routine has said that the device is ready. So you are ALWAYS guaranteed that the device will have a character by the time INPUT is called. You do not need to examine the status of the device, simply read the character from the device and return with the character in the A register. As in the above routines, the D register will contain the device number to perform the input from.

The OUTPUT routine is very similiar to the INPUT routine, except that it performs an output function. Once again, the device number to output to will be in the D register as a value 1 through 8. As in the routine above, you do not need to examine the status of the device. OUTPUT will ONLY be called after the device status (through OTSTAT) has already been examined and returned with a ready value. The character in the C register is the character that should be sent to the device.

Those are the five routines that need to be written. You should follow the supplied examples in the USERIO.MAC file to guide you in writing user I/O drivers.

After writing the I/O drivers, you will need to install them in DOS 3. As we mentioned above, the user I/O drivers need to be supplied in "SPR" page relocatable form. See the Digital Research CP/M manual for more information about the "SPR" type of file.

After assembling your user I/O drivers you must produce a file:

USERIO.SPR

The method for producing the "SPR" file requires some special utilities:

1. Assembler that produces a ".REL" file (such as Microsoft "M80")
2. Digital Research's "LINK" utility

First, the source code file must be created with no ORG statement. This will force the assembler to produce a relocatable type of file. Next, the Digital Research LINK utility is used to produce the "SPR" file from the "REL" file directly:

```
A>LINK USERIO.SPR=USERIO[OP,L0]
```

To use the USERIO drivers, you must run the DYNASYS program. Using the "CA" option in DYNASYS, you can assign USR1-USR8 to any console, driver, reader, or punch channel. After the drivers are assigned, use the "CD" and "WR" options to create a new system disk. When the operating system "calls" any of the user I/O drivers, it will load the D register with the number of the I/O driver that you assign during DYNASYS. So, the D register will be loaded with a value between 1 and 8 for the eight user I/O drivers USR1-USR8:

**DYNASYS VERSION X.XX - FOR DYNABYTE DOS 3.XX
CP/M 2.2 SYSTEM REGENERATION UTILITY**

CHARACTER I/O DEVICE ASSIGNMENTS

CPU1 - CPU2 = CPU SERIAL PORTS	CPUP = CPU PARALLEL PORT
OCT1 - OCT16 = OCTAPORT PORTS	MOD1 - MOD8 = AUTO-ANSWER MODEM
USR1 - USR8 = USER I/O DRIVERS	

CONSOLE	LIST	READER	PUNCH
C0) 0 = CPU2	L0) 0 = CPU1	R0) 0 = CPU1	P0) 0 = CPU1
C1) 1 =	L1) 1 =	R1) 1 =	P1) 1 =
C2) 2 =	L2) 2 =	R2) 2 =	P2) 2 =
C3) =	L3) 3 =	R3) 3 =	P3) 3 =

ENTER MENU ITEM TO CHANGE (RETURN TO LEAVE AS IS) ?

Once the USERIO.SPR file has been created, using the I/O drivers is as easy as any of the other I/O drivers inside of DOS 3.

That's all there is to writing, installing and using the USER I/O DRIVERS. We suggest that you first "play" with the supplied example user I/O drivers for the two CPU serial ports. It is a good idea to go through the entire procedure of:

1. Edit USERIO.MAC for your devices
2. Assemble USERIO.MAC to produce USERIO.REL
3. Link USERIO.REL to produce USERIO.SPR
4. Run DYNASYS using "CA" option to install drivers
- 4.1 Run DYNASYS "CD" and "WR" options to create a new system disk

After you have done the steps a few times, you will be able to understand the sequence better and modifying the source file will become much easier.

Once again, let us point out that MOST users will not have to bother with the USER I/O DRIVERS. MOST users will be able to use the supplied I/O drivers for the CPU ports and the octoport ports. This chapter and the user I/O drivers have been included to provide the user with more versatility for the DOS 3 system.

9.2 Cold and Warm Boots

DOS 3 allows two different methods of booting the system. The cold boot is accomplished by either powering on or by pressing the reset button.

The warm boot can be accomplished by entering CTRL-C as the first character in a command line at the keyboard or by a running program branching to address 00.

9.2.1 Cold Boot

The cold boot process is performed in three stages. The results after each of the three stages is shown in Figure 9.1.

When a cold boot is triggered by powering on or pressing the reset button, the ROM code is executed. The ROM is the primary loader. The size of the ROM varies with the booting device (see Section 4.0, THE BOOT ROM). The ROM size also controls how much of the disk is to be read into memory. If the ROM is 256K bytes, it must be a floppy environment and the first sector of the first track of the floppy disk is read into memory locations 80H-FF hex.

If the ROM is 512K, you may cold boot from either a floppy or hard disk. The third sector from the first track of the hard disk is read into locations 0-1FF hex.

If the ROM is 2048K, you are booting from a cartridge tape. The first 8K blocks from the tape are read into memory locations 0-1FFF hex. This small system from the tape, now in memory, only lets you format the hard disk on the system and copy an operating system to the disk.

DOS 3 BOOT/LOAD OPERATION

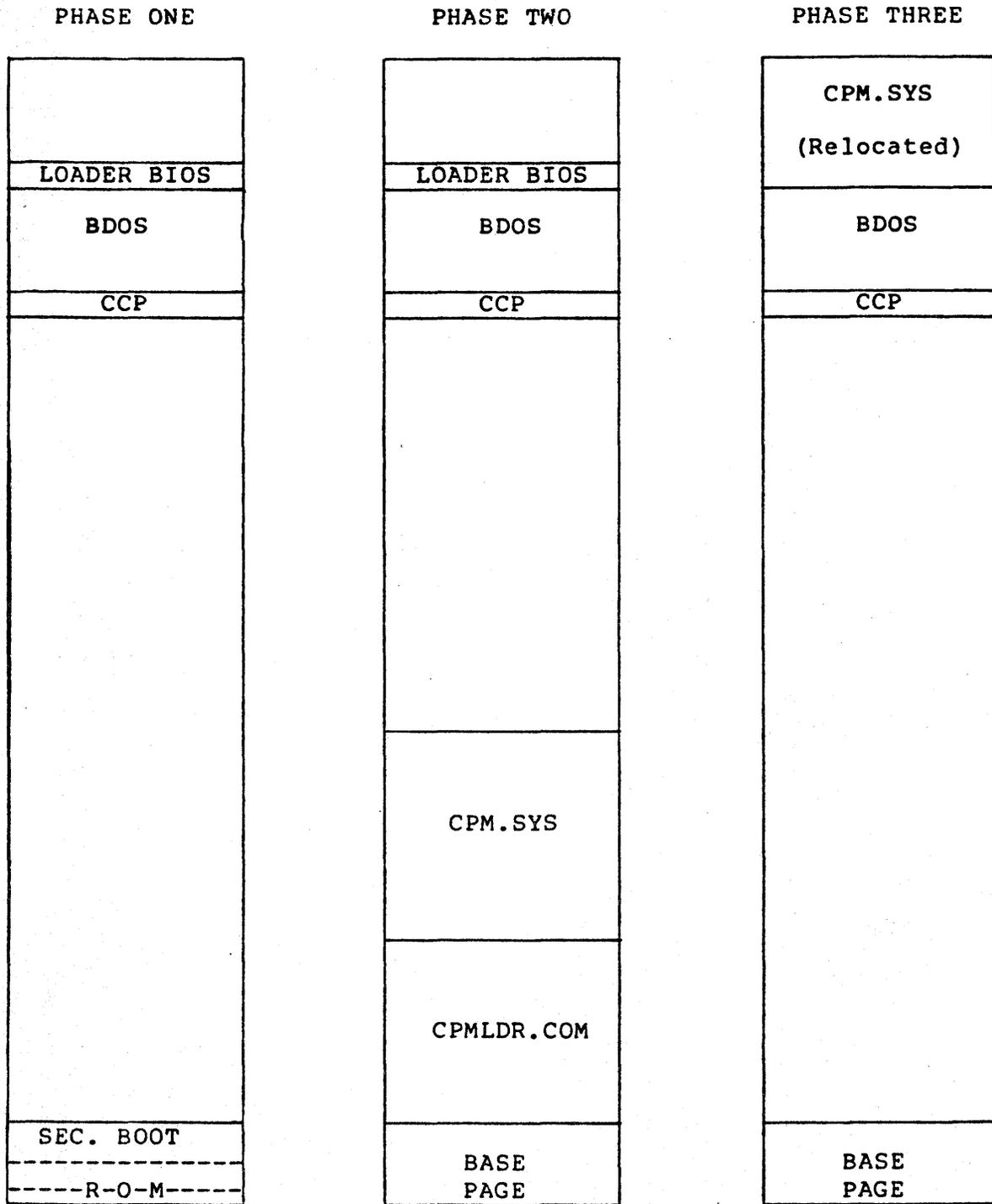


Figure 9.1

The program just read into memory (the secondary loader) will be executed. It then reads in more programs and data from the booting device.

In a floppy environment, the second through twenty-sixth sectors from track 0 and the first 26 sectors from track 1 are read into memory starting with the address specified by MOVCPM (see Section 3.4). In a hard disk environment, all of track 0 is read in. This loads CCP, BDOS, and the LOADER BIOS. Phase one ends when control is passed from the secondary boot to the CCP.

In phase two, CCP auto loads the file CPMLDR.COM at 100 hex as a standard COM file. CPMLDR reads the file CPM.SYS (created by DYNASYS) from the booting device. CPM.SYS is the Dynabyte BIOS in page relocatable form. Then CPMLDR relocates CPM.SYS to run at the actual BIOS base address. CPMLDR examines the size of the CPM.SYS in relocatable format and does a memory test of the BIOS memory area to see if there is enough room to completely load CPM.SYS. If there is not enough memory, an error message is displayed, and the boot process halts. You should then boot a previously generated system and run MOVCPM to move CCP down to make more room for CPM.SYS. When CPM.SYS is loaded, phase two is complete.

In phase three, the CPMLDR moves the relocated CPM.SYS to the area above BDOS, overwriting LOADER BIOS and then jumps to CCP and DOS 3 signs on.

9.2.2 Warm Boot

A warm boot causes software control to be given to the warm boot code in the BIOS. The warm boot code reads CCP and BDOS into memory from the warm boot device and gives control to the CCP.

There are six parameters within DYNASYS that relate to the booting process:

1. Cold boot log device
2. Warm boot log device
3. Cold boot chain command
4. Warm boot chain command
5. Cold boot message display
6. Load Map display or suppression

9.2.3 Disk Log

During the cold boot procedure, the CCP examines a user-defined parameter that determines which disk will be the initial logged disk drive. The CL parameter (set in DYNASYS) allows you to set the logged drive to any drive. If you assign drive B as the cold boot logged device, the system comes up with the B> prompt. This prepares the system for use faster if you prefer a logged drive other than drive A.

In the warm boot process the logged drive is determined before control is passed to the new copy of CCP.

9.2.4 Chain Modules

DOS 3 is capable of executing a single predefined command line at the end of either a cold or warm boot. This single command line is defined using the CM option of DYNASYS. In this way a computer operator can power on the computer system and be up and running an application package (a word processing package, accounts receivable, etc.) without ever communicating with the operating system.

During the cold boot process, before the CPMLDR gives control to the CCP, the CPM.SYS file is examined to determine if a cold boot chain command has been installed. If no chain command is installed, control is passed to the CCP. If there is a chain command installed, that command is placed in the CCP for execution.

During the warm boot procedure, the warm boot program checks the system data page to determine if a warm boot chain command is present. If one is present, it is loaded in CCP and control is given to CCP. If there is no warm boot chain command, control is passed immediately to the CCP.

9.2.5 Cold Boot Message Display

This feature enables you to give the operating system a customized look by substituting the standard DYNABYTE DOS 3 sign-on message for something more friendly, such as a company logo.

The cold boot sign-on message must be an ASCII file, prepared in advance. The last character of the file must be a \$. The name of the file must be entered via the DL option of DYNASYS prior to cold booting the system.

During the cold boot process, CPMLDR checks the system data page to determine if a cold boot message display has been installed. If it has, the file is retrieved and copied to the screen until the first occurrence of a \$. The \$ terminates the message. If there is no message entered, the standard sign-on message is displayed.

9.2.6 System Load Map

The system load map appears on the display prior to the cold boot message. The system load map shows where system routines reside in system memory and their length. The details of this map are explained in Appendix B.

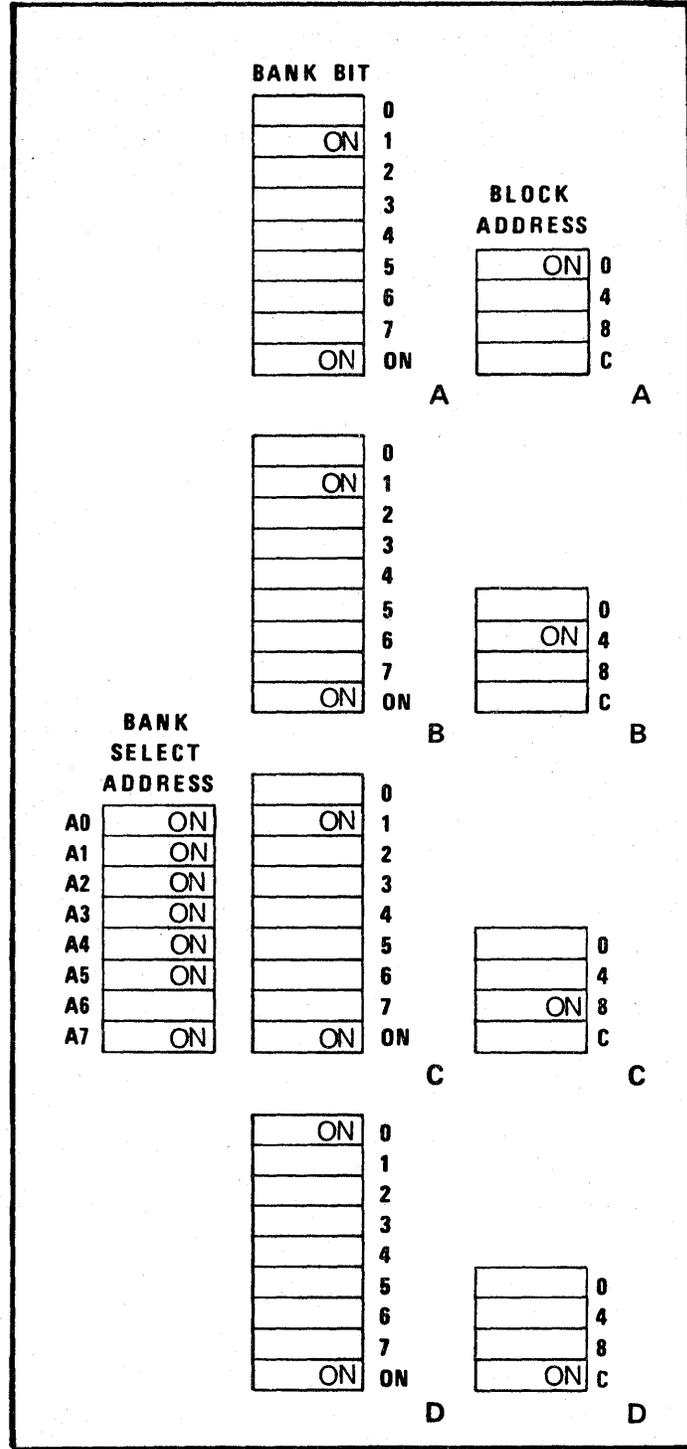
The system load map display can be suppressed via the DL option in DYNASYS. It is suggested that the map be displayed until the system has become stable.

APPENDIX A**MEMORY BOARD SWITCH SETTINGS**

DOS 3 supports a maximum of 64K of dynamic memory called Random Access Memory (RAM). The switch settings on the memory board should match those illustrated on the following page.

Both DOS 4 and DOS 5 memory board configurations will be able to run DOS 3 without modifying the switch settings. Regardless of the amount of memory in the computer, the most DOS 3 will access is 64K.

64K DYNAMIC MEMORY



ON = Jumper cap on or RIGHT side of switch depressed (Closed)
 BLANK = Jumper cap off or LEFT side of switch depressed (Open)

APPENDIX B

SYSTEM LOAD MAP

When DOS 3 is booted, the system memory map is displayed. This display can be omitted from the booting procedure if so desired via the DYNASYS (Section 3.1) program. This information shows the user which modules of the operating system remain in system memory and where they reside.

The system load map shows the base address and the length of each module in hexadecimal. Please note that each of the system modules begins on a new 100 hex boundary.

DYNABYTE DOS 3.XX LOADER

SYSBASE	DAT	0000H	0100H
TPA	DAT	0100H	C600H
CCP	DAT	C700H	0806H
BDOS	SPR	CF06H	0DFAH
EXEC	SPR	DD00H	02FFH
SYSTEM	DAT	E00H	0100H
CPUIO	SPR	E100H	008EH
FUJITSU	SPR	E200H	047DH
FUJITSU	DAT	E700H	0468H
FLOPPY	SPR	EC00H	0518H
FLOPPY	DAT	F200H	022DH
MINIWINI	SPR	F500H	04FCH
MINIWINI	DAT	FA00H	03CAH
SYSTEM	TOP	FDFH	0000H

57K CPM 2.2 SYSTEM INSTALLED

DYNABYTE DOS 3.XX

SYSBASE.DAT

The System Base Page is always 0-FF hex. It is used by CP/M for cold and warm boot start information, BDOS jump vectors, and I/O byte storage. For more information on the System Base Page refer to the Digital Research CP/M Alteration Guide.

TPA.DAT

The Transient Program Area is where user programs are executed. The size of the TPA is the maximum size for a user program allowable with this configuration.

CCP.DAT

The base address of the Console Command Processor is determined by the MOVCPM (Section 3.4) program. It is always 806 hex bytes in length. See the Digital Research CPM 2.2 User's Guide for more information on CCP.

BDOS.SPR

The Basic Disk Operating System program is always DFA hex bytes in length. For more information on BDOS refer to Digital Research CP/M 2.2 User's Guide and CP/M 2.2 Interface Guide.

EXEC.SPR

This is the base module of the Dynabyte BIOS. This module gets control via calls from BDOS and vectors control to appropriate modules.

SYSTEM.DAT

The System Data Page is always 100 hex in length. It is set up by DYNASYS and therefore contains information on which modules are installed, where in memory they reside, which logical device letter is associated with physical devices, which I/O ports are assigned to devices, and which of six cold and warm boot parameters are present.

SYSTEM.TOP

SYSTEM.TOP indicates the last byte of memory used by Dynabyte BIOS. It literally refers to the top of allocated memory. Any memory space above this will not be addressed and therefore is wasted. The address of SYSTEM.TOP is needed to do the calculations for MOVCPM (see Section 3.4).


```

INTTBL EQU DSKTBL+16 ;OFFSET TO CPU I/O INIT TABLE
CLOGON EQU INTTBL+4 ;OFFSET TO COLD BOOT LOGON DRIVE
WLOGON EQU CLOGON+1 ;OFFSET TO WARM BOOT LOGON DRIVE
CMESS EQU WLOGON+1 ;OFFSET TO COLD BOOT MESSAGE
CCHAIN EQU CMESS+2 ;OFFSET TO COLD BOOT CHAIN ADDRESS
WCHAIN EQU CCHAIN+2 ;OFFSET TO WARM BOOT CHAIN ADDRESS
RDRSTP EQU WCHAIN+2 ;OFFSET TO READER/PUNCH BIT STRIP
LNKTBL EQU RDRSTP+1 ;OFFSET TO LINKAGE TABLES

```

```

;
PAGE

```

```

;
;-----
; COLD INIT ROUTINE
;-----
;

```

```

PROCEDURE:

```

```

1) INITIALIZE THE UARTS

```

```

ENTRY: DE = ADDRESS OF SYSTEM DATA PAGE

```

```

EXIT: NO PARAMETERS RETURNED

```

```

;
CINIT:

```

```

;
LD A,1 ;RESET UARTS AND DISABLE INTERRUPTS
OUT (84H),A
OUT (94H),A

```

```

;
LD HL,INTTBL
ADD HL,DE ;POINT TO INIT TABLE FOR CPU I/O

```

```

;
LD A,(HL) ;GET THE HI/LO 1 PARAMETER
OUT (84H),A ;AND OUTPUT IT

```

```

;
INC HL
LD A,(HL) ;GET THE BAUD FOR CPU 1
OUT (85H),A ;AND OUTPUT IT

```

```

;
INC HL
LD A,(HL) ;GET THE HI/LO 2 PARAMETER
OUT (94H),A ;AND OUTPUT IT

```

```

;
INC HL
LD A,(HL) ;GET THE BAUD FOR CPU 2
OUT (95H),A ;AND OUTPUT IT

```

```

;
RET ;INITIALIZATION COMPLETE NOW

```

```

;
PAGE

```

```

;
;-----
; INPUT STATUS ROUTINE
;-----
;

```

```

;      PROCEDURE:
;          1)  SET UP PARAMETERS FOR APPROPRIATE I/O ROUTINE
;          2)  CHECK INPUT STATUS FOR THAT DEVICE
;
;      ENTRY:  D = DEVICE NUMBER (1-16)
;
;      EXIT:   A = 00 = NO CHARACTER IS READY TO BE RECEIVED
;             = FF = CHARACTER READY TO BE RECEIVED
;
;
;      INSTAT:
;          LD      C,83H          ;SET DEFAULT I/O TO CPU1
;
;          DEC     D              ;CPU I/O 1 ?
;          JR      Z,GSTAT       ;YES -->
;
;          LD      C,93H          ;SET I/O TO CPU2
;          DEC     D              ;CPU I/O 2 ?
;          JR      Z,GSTAT       ;YES, -->
;
;          LD      C,81H          ;SET I/O TO CPUP
;
;      GSTAT:
;          IN      A,(C)          ;GET STATUS BYTE
;          AND     8              ;CHARACTER READY TO BE RECEIVED ?
;
;      GNSTAT:
;          RET     Z              ;NO, JUST RETURN
;
;          LD      A,0FFH         ;ELSE RETURN READY STATUS
;          RET
;
;      PAGE
;
;-----
;
;      CPU INPUT ROUTINE
;-----
;
;      PROCEDURE:
;          1)  SET-UP PARAMETERS FOR APPROPRIATE INPUT PORT
;          2)  GET CHARACTER
;
;      ENTRY:  D = DEVICE NUMBER (1-16)
;
;      EXIT:   A = 8 BIT CHARACTER
;
;
;      INPUT:
;          LD      C,80H          ;SET DEFAULT TO CPU 1
;
;          DEC     D              ;CPU 1 ?
;          JR      Z,GINPU       ;YES -->
;
;          LD      C,90H          ;SET UP FOR CPU 2
;          DEC     D              ;CPU 2 ?
;          JR      Z,GINPU       ;YES -->

```

```

;
; LD C,91H ;SET UP FOR CUP
;
GINPU:
; IN A,(C) ;GET CHARACTER
; RET
;
; PAGE
;
;-----
; CPU OUTPUT STATUS
;-----
;
; PROCEDURE:
; 1) SET UP PARAMETERS FOR APPROPRIATE I/O DEVICE
; 2) GET OUTPUT STATUS FOR THAT DEVICE
;
; ENTRY: D = DEVICE NUMBER (1-16)
;
; EXIT: A = 00 = DEVICE NOT READY FOR OUTPUT
;       = FF = DEVICE READY FOR OUTPUT
;
;
; OISTAT:
; DEC D ;CPU 1 STATUS NEEDED ?
; JR Z,OST1 ;YES -->
;
; DEC D ;CPU 2 STATUS NEEDED ?
; JR NZ,OSTIP ;NO, GET PARALLEL STATUS
;
; IN A,(93H) ;GET STATUS BYTE FOR CPU 2
; AND 10H ;UART READY FOR MORE OUTPUT ?
; RET Z ;NO, RETURN NOT READY
;
; IN A,(81H)
; AND 80H ;IS CLEAR TO SEND READY ?
; RET Z ;NO, RETURN NOT READY
;
; LD A,0FFH ;ELSE RETURN OUTPUT READY
; RET
;
; OST1:
; IN A,(83H) ;GET STATUS BYTE FOR CPU 1
; AND 10H ;UART READY FOR MORE OUTPUT ?
; RET Z ;NO, RETURN NOT READY
;
; IN A,(81H)
; AND 20H ;IS CLEAR TO SEND READY ?
; RET Z ;NO, RETURN NOT READY
;
; OSTIN:
; LD A,0FFH ;ELSE RETURN OUTPUT READY
; RET
;
; OSTIP:

```

```

IN      A, (81H)          ;GET PARALLEL PORT STATUS
CPL                    ;CONVERT TO ACTIVE HIGH
AND     2                ;CLEAR TO SEND READY ?
JR      OSTIN            ;RETURN STATUS VALUE
PAGE

;
;-----
;          CPU OUTPUT ROUTINE
;-----
;
;  PROCEDURE:
;      1)  SET UP PARAMETERS FOR APPROPRIATE OUTPUT PORT
;      2)  GET OUTPUT STATUS FOR IT
;
;  ENTRY:  D = DEVICE NUMBER (1-16)
;          C = CHARACTER TO OUTPUT
;
;  EXIT:   NO PARAMETERS RETURNED
;
;
; OUTPUT:
LD      A,C              ;PUT CHARACTER INTO A
;
LD      C,86H           ;SET DEFAULT OUTPUT FOR CPU1
;
DEC     D               ;CPU 1 OUTPUT NEEDED ?
JR      Z,GOUTPUT      ;YES --?
;
LD      C,96H           ;SET OUTPUT FOR CPU2
DEC     D               ;CPU 2 OUTPUT NEEDED ?
JR      NZ,OUTPLL      ;NO, OUTPUT TO PARALLEL PORT
;
; GOUTPUT:
OUT     (C),A           ;OUTPUT THE CHARACTER
RET
;
; OUTPLL:
OUT     (97H),A        ;OUTPUT CHARACTER TO PARALLEL PORT
;
LD      A,0FBH         ;STROBE MASK, BIT 2 LOW
OUT     (87H),A        ;STROBE
CPL
OUT     (87H),A
CPL
OUT     (87H),A
RET
;
END

```

Macros:

Symbols:

CCCHAIN	0028	CINT'	000F'	CLOGON	0024	CMESS	0026
CON'TBL	0000	DSK'TBL	0010	GINPU	0049'	GNSTAT	0039'
GOUTPU	007E'	GSTAT	0035'	INPUT	003D'	INSTAT	0029'
INT'TBL	0020	LNK'TBL	002D	LST'TBL	0004	OST1	005F'
OSTIN	0068'	OSTIP	006C'	OTSTAT	004C'	OUTPLL	0081'
OUTPUT	0073'	PUN'TBL	000C	RDRSTP	002C	RDR'TBL	0008
WCHAIN	002A	WLOGON	0025				

No Fatal error(s)

APPENDIX D**FILES ON DISTRIBUTION MEDIA**

Dynabyte supplies a list of all of the files that should come with your system. This information is stored as ASCII file CPMDIST.DES. To print this file out use either the TYPE command with a CTRL-P (to turn on the printer) or use PIP to copy the file to the printer.

There are two files on the distribution media that are used to recreate DOS 3 back onto two floppy disks. The file names are COPY1.SUB and COPY2.SUB. To get a listing of these two files either PIP the files to the printer or use the TYPE command with the CTRL-P option set.

Description of Files on DOS 3 Distribution Disk

System BOOT Files

CPM.SYS BIOS FOR CURRENT SYSTEM IN RELOCATABLE FORM (NEEDED FOR BOOT)
 CPMLDR.COM DOS 3.XX SYSTEM LOADER (NEEDED FOR BOOT)

System Re-generation Files

DYNASYS.COM SYSTEM RE-GENERATOR
 DYNAGEN.COM SYSTEM TRANSFER UTILITY

MOVCPM.COM SYSTEM SIZE REGENERATOR

MWCPM.SPR SPR FILE FOR GENERATING A NEW MICROPOLIS SYSTEM (FOR MOVCPM)
 FUJCPM.SPR SPR FILE FOR GENERATING A NEW FUJITSU SYSTEM
 FPYCPM.SPR SPR FILE FOR GENERATING A NEW FLOPPY SYSTEM
 MINICPM.SPR SPR FILE FOR GENERATING A NEW MINI WINCHESTER SYSTEM

MWCPM.COM 57K MICROPOLIS SYSTEM (CREATED BY MOVCPM.COM)
 FUJCPM.COM 57K FUJITSU SYSTEM (CREATED BY MOVCPM.COM)
 FPYCPM.COM 57K FLOPPY SYSTEM (CREATED BY MOVCPM.COM)
 MINICPM.COM 57K MINI WINCHESTER SYSTEM (CREATED BY MOVCPM.COM)

EXEC.SPR EXEC ROUTINE FOR GENERATING A NEW SYSTEM
 CPUIO.SPR CPU MODULE
 OCTAPORT.SPR OCTAPORT MODULE
 MODEM.SPR MODEM MODULE
 USERIO.SPR USERIO MODULE

FLOPPY.SPR FLOPPY DISK DRIVER MODULE
 FLOPPY.DAT FLOPPY DISK DATA MODULE
 FUJITSU.SPR FUJITSU WINCHESTER HARD DISK (8") DRIVER MODULE
 FUJITSU.DAT FUJITSU WINCHESTER HARD DISK DATA MODULE
 MICROP.SPR MICROPOLIS WINCHESTER HARD DISK (8") DRIVER MODULE
 MICROP.DAT MICROPOLIS WINCHESTER HARD DISK DATA MODULE
 DEBLOCK.SPR DISK DEBLOCKING MODULE
 DEBLOCK.DAT DISK DEBLOCKING DATA MODULE
 MINIWINI.SPR MINI WINCHESTER HARD DISK (5 1/4") DRIVER MODULE
 MINIWINI.DAT MINI WINCHESTER HARD DISK DATA MODULE

Dynabyte System Utilities

FFORMAT.COM	FLOPPY DISK FORMAT/CHECK UTILITY
FUJFMT.COM	FUJITSU WINCHESTER (8") HARD DISK FORMAT/CHECK UTILITY
WFORMAT.COM	MICROPOLIS WINCHESTER (8") HARD DISK FORMAT/CHECK UTILITY
WINFMT5.COM	MINI WINCHESTER (5 1/4") HARD DISK FORMAT/CHECK UTILITY
QA.COM	DISTRIBUTION DISK FILE CHECKSUM VERIFICATION UTILITY
DYNASTAT.COM	SYSTEM STATUS UTILITY
CONSOLE.COM	CONSOLE DEVICE SWITCHING UTILITY
PRINION.COM	PRINTER DEVICE SWITCHING UTILITY
READON.COM	READER DEVICE SWITCHING UTILITY
PUNCHON.COM	PUNCH DEVICE SWITCHING UTILITY
BACKUP.COM	DYNABYTE DISK BACKUP UTILITY

Digital Research System Utilities

PIP.COM	FILE TRANSFER UTILITY
SUBMIT.COM	BATCH PROCESSOR
XSUB.COM	EXTENDED SUBMIT
ED.COM	EDITOR
ASM.COM	8080 ASSEMBLER
DDT.COM	DEBUGGER
LOAD.COM	HEX TO COM FILE UTILITY
STAT.COM	DRIVE STATUS
DUMP.COM	FILE DUMP

System Software Example Source Code Files

DUMP.ASM	SOURCE FOR DUMP.COM (ASSEMBLE WITH DIGITAL RESEARCH ASM.COM)
USERIO.MAC	SOURCE FOR USERIO MODULE (ASSEMBLE WITH MICROSOFT M80.COM)

DOS 3.XX Distribution Disk Copy Submit Utilities

COPY1.SUB	SUBMIT UTILITY TO COPY DISTRIBUTION DISK #1 FILES
COPY2.SUB	SUBMIT UTILITY TO COPY DISTRIBUTION DISK #2 FILES

Tape Utility Files

DTIP.COM	TAPE FILE READ/WRITE UTILITY
DYNABYTE.TAP	TAPE BOOT FILE (MUST BE FIRST FILE ON BOOT TAPE)
LOADER.TAP	TAPE SYSTEM LOADER (MUST BE SECOND FILE ON BOOT TAPE)
WFORMAT.TAP	TAPE VERSION OF MICROPOLIS 8" HARD DISK FORMATTER
FUJFMT.TAP	TAPE VERSION OF FUJITSU 8" HARD DISK FORMATTER

WINFMT5.TAP TAPE VERSION OF MINI WINICHESTER 5.25" HARD DISK FORMATTER
HDTAPGEN.TAP TAPE VERSION OF FOR SYSTEM GENERATION TO HARD DISK

CPMTAPE.TIP TAPE SUBMIT FILE TO BUILD BOOT TAPE FROM DISK

FUJCPM.SYS PRE-CONFIGURED FUJITSU SYSTEM FOR HDTAPGEN.TAP
MWCPM.SYS PRE-CONFIGURED MICROPOLIS SYSTEM FOR HDTAPGEN.TAP
MINICPM.SYS PRE-CONFIGURED MINIWINI SYSTEM FOR HDTAPGEN.TAP

END OF DESCRIPTIONS

The following is a listing of the SUBMIT files used to create copies of the original distribution disks from a hard disk.

```
;
;   COPY1.SUB
;
; THIS SUBMIT GENERATES DOS 3.XX DISTRIBUTION DISK #1
;
; FORM OF SUBMIT IS :
;           A>SUBMIT COPY1 SOURCE DESTINATION
;
;   WHERE "SOURCE" IS THE SOURCE DISK DRIVE (IE. "A")
;   AND "DESTINATION" IS THE DESTINATION DISK DRIVE (IE. "B")
;
$1:PIP $2:=$1:CPMLDR.COM
$1:PIP $2:=$1:CPM.SYS
;
$1:PIP $2:=$1:MWCPM.SPR
$1:PIP $2:=$1:FUJCPM.SPR
$1:PIP $2:=$1:FPYCPM.SPR
$1:PIP $2:=$1:MINICPM.SPR
;
$1:PIP $2:=$1:DYNASYS.COM
$1:PIP $2:=$1:DYNAGEN.COM
$1:PIP $2:=$1:PIP.COM
$1:PIP $2:=$1:SUBMIT.COM
;
$1:PIP $2:=$1:MOVCPM.COM
$1:PIP $2:=$1:MWCEM.COM
$1:PIP $2:=$1:FUJCPM.COM
$1:PIP $2:=$1:FPYCPM.COM
$1:PIP $2:=$1:MINICPM.COM
;
$1:PIP $2:=$1:EXEC.SPR
$1:PIP $2:=$1:CPUIO.SPR
$1:PIP $2:=$1:OCTAPORT.SPR
$1:PIP $2:=$1:MODEM.SPR
$1:PIP $2:=$1:USERIO.SPR
;
$1:PIP $2:=$1:FLOPPY.SPR
$1:PIP $2:=$1:FLOPPY.DAT
$1:PIP $2:=$1:FUJITSU.SPR
$1:PIP $2:=$1:FUJITSU.DAT
$1:PIP $2:=$1:MICROP.SPR
$1:PIP $2:=$1:MICROP.DAT
$1:PIP $2:=$1:DEBLOCK.SPR
$1:PIP $2:=$1:DEBLOCK.DAT
$1:PIP $2:=$1:MINIWINI.SPR
$1:PIP $2:=$1:MINIWINI.DAT
;
$1:PIP $2:=$1:FUJFMT.COM
$1:PIP $2:=$1:FFORMAT.COM
$1:PIP $2:=$1:WFORMAT.COM
$1:PIP $2:=$1:WINFMT5.COM
```

```

;
$1:PIP $2:=$1:COPY1.SUB
;
$1:PIP $2:=$1:CPMDIST.DES
;
; DISTRIBUTION TRANSFER FOR DISTRIBUTION DISK #1 COMPLETE
;

```

```

;
; COPY2.SUB
;
; THIS SUBMIT GENERATES DOS 3.XX DISTRIBUTION DISK #2
;
; FORM OF SUBMIT IS :
;
; A>SUBMIT COPY2 SOURCE DESTINATION
;
; WHERE "SOURCE" IS THE SOURCE DISK DRIVE (IE. "A")
; AND "DESTINATION" IS THE DESTINATION DISK DRIVE (IE. "B")
;
$1:PIP $2:=$1:CPMLDR.COM
$1:PIP $2:=$1:CPM.SYS
;
$1:PIP $2:=$1:CPMTAPE.TIP
$1:PIP $2:=$1:DTIP.COM
$1:PIP $2:=$1:DYNABYTE.TAP
$1:PIP $2:=$1:LOADER.TAP
$1:PIP $2:=$1:WFORMAT.TAP
$1:PIP $2:=$1:FUFMT.TAP
$1:PIP $2:=$1:WINFMT5.TAP
$1:PIP $2:=$1:HDTAPGEN.TAP
$1:PIP $2:=$1:FUJCPM.SYS
$1:PIP $2:=$1:MWCPM.SYS
$1:PIP $2:=$1:MINICPM.SYS
;
$1:PIP $2:=$1:DYNASTAT.COM
$1:PIP $2:=$1:CONSOLE.COM
$1:PIP $2:=$1:PRINTON.COM
$1:PIP $2:=$1:READON.COM
$1:PIP $2:=$1:PUNCHON.COM
;
$1:PIP $2:=$1:BACKUP.COM
;
$1:PIP $2:=$1:PIP.COM
$1:PIP $2:=$1:SUBMIT.COM
$1:PIP $2:=$1:XSUB.COM
$1:PIP $2:=$1:ED.COM
$1:PIP $2:=$1:ASM.COM

```

```
$1:PIP $2:=$1:DDT.COM
$1:PIP $2:=$1:LOAD.COM
$1:PIP $2:=$1:STAT.COM
$1:PIP $2:=$1:DUMP.COM
$1:PIP $2:=$1:DUMP.ASM
$1:PIP $2:=$1:USERIO.MAC
;
$1:PIP $2:=$1:COPY2.SUB
;
$1:PIP $2:=$1:CPMDIST.DES
;
; DISTRIBUTION TRANSFER FOR DISTRIBUTION DISK #2 COMPLETE
;
```

Description of Files on the Optional Third DOS 3 Distribution Disk

To support the CMD hard disk drive, Dynabyte provides an optional third distribution disk.

System BOOT Files

CEMLDR.COM DOS 3.XX SYSTEM LOADER (NEEDED FOR BOOT)
CPM.SYS BIOS FOR CURRENT SYSTEM ON RELOCATABLE FORM

System Re-generation Files

CMDCPM.SPR SPR FILE FOR GENERATING A NEW CMD SYSTEM
CMDCPM.COM BOOTSTRAP LOADER FOR CMD
CMD.SPR LOAD MODULES USED BY DYNASYS
CMD32.DAT CMD HARD DISK DATA MODULE
CMD64.DAT CMD HARD DISK DATA MODULE
CMD96.DAT CMD HARD DISK DATA MODULE

Dynabyte System Utilities

HFORMAT.COM CMD FORMAT/CHECK UTILITY
HCOPY.COM CMD BACKUP UTILITY

Tape Utility Files

HFORMAT.TAP TAPE VERSION OF CMD FORMAT UTILITY
CMDCPM.SYS PRE-CONFIGURED CMD SYSTEM FOR HDTAPGEN

Digital Research System Utilities

PIP.COM FILE TRANSFER UTILITY

The following is a listing of the SUBMIT files used to create copies of the original distribution disks from a hard disk.

```
;
;   3XXDIS3.SUB
;
; THIS SUBMIT GENERATES DOS 3.XX DISTRIBUTION DISK #3
;
; FORM OF SUBMIT IS :
;   A>SUBMIT 3XXDIS3 DSKDRIVE
;
; WHERE DSKDRIVE IS THE FLOPPY DRIVE
;
DSKRESET $1
;
PIP $1:=E:CPMLDR.COM
PIP $1:=E:CPM.SYS
;
PIP $1:=E:CMDCPM.SPR
PIP $1:=E:CMDCPM.COM
PIP $1:=E:CMD.SPR
PIP $1:=E:CMD32.DAT
PIP $1:=E:CMD64.DAT
PIP $1:=E:CMD96.DAT
PIP $1:=F:HFORMAT.COM
PIP $1:=F:HCOPY.COM
PIP $1:=F:HFORMAT.TAP
PIP $1:=E:CMDCPM.SYS
PIP $1:=E:PIP.COM
;
QAGEN /$1
;
; DISTRIBUTION TRANSFER FOR DISTRIBUTION DISK #3 COMPLETE
```


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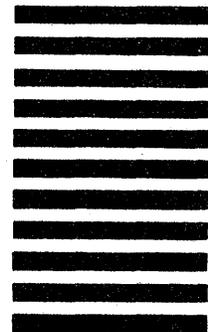
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