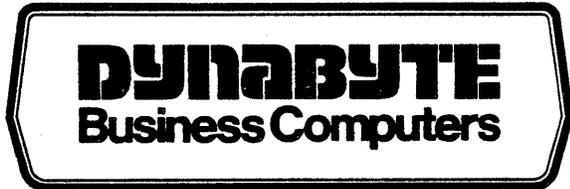


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**Monarch
MP/M II
User's Guide**



411159
Rev. C

MONARCH
MP/M II
USER'S GUIDE

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MONARCH
MP/M II
USER'S GUIDE

P/N 411159
Rev. C

TABLE OF CONTENTS

INTRODUCTION	i
Monarch MP/M II Features	i
Scope of this Manual	ii
Documentation Conventions	iii
 Section 1	
GETTING STARTED WITH MP/M II	1-1
Getting Started from Diskettes.	1-1
Getting Started from Cartridge Tape	1-12
 Section 2	
FORMAT	2-1
Overview.	2-1
Logical versus Physical Drives.	2-1
FORMAT'S Relationship to DYNASYS.	2-1
Compatibility Between Operating Systems	2-1
System Warm-up.	2-2
Reformatting.	2-2
Diskettes.	2-2
Description	2-2
Formatting Diskettes.	2-4
Menu Prompt FORMAT.	2-4
Side Selection	2-5
Density.	2-5
Directory Entries	2-6
Rapid FORMAT.	2-7
Standard Options FORMAT	2-9
Aborting FORMAT	2-9
Transferring Data Between Computers	2-9
Winchester Hard Disks.	2-10
Description	2-10
Formatting Winchester Hard Disks.	2-10
Configuring the Winchester Hard Disk.	2-13

Reformatting Logical Winchester Drives	2-15
The Drive Check Option	2-17
 Section 3	
DYNASTAT and DYNASYS	3-1
DYNASTAT	3-1
Console Assignments	3-3
Console Mask	3-3
Printer Assignments	3-4
Disk Drive Assignments	3-5
MP/M II Memory Segment Partition	3-5
System Speed	3-6
Port Setup Parameter Values	3-6
Memory Disk	3-7
DYNASYS Overview.	3-8
DYNASYS	3-11
EZ Option: Easy Configuration	3-11
AL Option: Assign / Setup All Parameters	3-12
CA Option: Character I/O Assignments	3-12
AS Option: Asynchronous Port Setup	3-17
SS Option: Synchronous Port Setup	3-19
DA Option: Disk Drive Assignments	3-22
Floppy Disk Drives	3-24
Winchester Hard Disk Drives	3-24
Memory Disk	3-25
DC Option: Display Current Configuration	3-25
LS Option: Load / Save Parameter File	3-27
The Load (LP) Option	3-27
The Save (SP) Option	3-28
The Clear (CP) Option	3-28
CD Option: Create System Disk	3-29
The Write (WR) Option	3-29
The Transfer (TR) Option	3-30
EX Option: Exit to Operating System	3-31

Section 4

FILESAVE and BACKUP. 4-1

FILESAVE. 4-1

 Using FILESAVE 4-2

 Restoring Files 4-4

BACKUP 4-6

 BACKUP versus PIP 4-6

 Invoking BACKUP 4-7

 Copying from Hard Disk to a Diskette Set 4-7

 Choosing Track or File Mode 4-8

 File by File Copy 4-9

 Restoring File by File, Diskette Set to Hard Disk 4-10

 Track by Track Copy 4-11

 Restoring Track by Track, Diskette Set to Hard Disk. 4-12

 Copying Between Like Devices 4-13

 Diskette to Diskette Copy 4-13

 Hard Disk to Hard Disk Copy 4-14

 Error Messages 4-15

Section 5

TAPE 5-1

 Description 5-1

 Cartridge Tape Media 5-1

 Testing the Cartridge Tape System 5-1

 Invoking Tape 5-2

TAPE Options 5-3

 Save Set Feature 5-5

Examples 5-5

Executable Instruction File 5-10

Error Messages 5-11

 TAPE Error Messages 5-12

 Tape Abort Errors 5-12

Preventive Maintenance 5-13

Technical Data 5-14

 TAPE Record Format 5-14

 Cartridge Drive Data Format 5-15

 DS-100, DZ-80B I/O Connections 5-16

APPENDICES

A.	UTILITY SUMMARY.	A-1
B.	MP/M II COMMAND GUIDE	B-1
C.	I/O HANDSHAKING LINES.	C-1
D.	INSTALLING AN IPL PROM	D-1
E.	USER'S COMMENTS FORM	E-1

INTRODUCTION

Monarch MP/M II is a multi-user, multi-tasking operating system that enhances the Digital Research MP/M II. MP/M II allows up to seven operators to simultaneously use the system. MP/M II also supports all standard and expansion I/O ports on the Monarch computer, allowing up to 17 devices — consoles and printers -- to be attached to a single Monarch computer. It also allows multi-tasking, permitting an individual operator to perform up to 16 separate tasks on the computer from a single console.

Dynabyte's enhanced version of MP/M II is totally compatible with the Digital Research MP/M II. You may use every one of the Digital Research facilities and features as outlined in the Digital Research MP/M II manuals. This manual describes Dynabyte's enhanced MP/M II utilities that are identified by the label DV N.N (Dynabyte Version N.N). All Monarch MP/M II utilities run under Digital Research MP/M II V2.1.

Monarch MP/M II Features

Dynabyte has developed a number of utilities that enhance your MP/M II operating system. These utilities allow you to format diskettes and Winchester hard disks, copy whole disks or individual files onto diskettes or cartridge tape, generate a new MP/M II system disk and display your system's current configuration.

- **DYNASYS Utility**

DYNASYS allows you to alter MP/M II system parameters such as logical drive designations and printer and console baud rates. When you add expansion units to your Monarch computer, DYNASYS will configure your system to accommodate your new hardware.

- **FORMAT Utility**

FORMAT allows you to format diskettes and Winchester hard disks. FORMAT supports single or double-sided diskettes. You may format diskettes in standard IBM single-density or double-density for greater storage capacity.

- **FILESAVE, BACKUP and TAPE Utilities**

FILESAVE copies files from the Winchester hard disk to diskette and restores them back to the hard disk. FILESAVE can copy files that exceed the size of a diskette.

BACKUP copies data between diskettes and hard disks. BACKUP copies files of any size, and in all user areas of a disk. BACKUP can also copy system tracks.

TAPE performs several tape unit functions. TAPE initializes the tape unit, creates copies of data and command files from floppy or hard disk onto magnetic cartridge tape by drive name and restores data to the disks.

- **Memory Disk**

The memory disk is a portion of memory that is configured as a disk. The memory disk temporarily stores files for high speed access.

- **Hardware Support**

Monarch MP/M II supports all of the features of the Monarch computer. These include 10 standard serial ports, 8 optional serial ports, high speed RS-422 communications ports, floppy disk drives, Winchester hard disk drives, and 1/4" cartridge tape.

Scope of this Manual

This manual provides a cookbook approach to installing Monarch MP/M II for the first time user and a detailed description of each Dynabyte utility. These utilities enhance rather than replace the MP/M II software. All Dynabyte utilities are identified by the label DVN.N — Dynabyte Version N.N.

This Monarch MP/M II User's Guide supplements the Digital Research MP/M II User's Guides. Dynabyte's Monarch MP/M II utilities run under the Digital Research MP/M II V2.2.

The Monarch MP/M II User's Guide is written for the user who is new to business microcomputer systems, and also for the advanced user who is already familiar with microcomputers but not well acquainted with Monarch MP/M II.

You should also have a copy of the Monarch User's Guide which describes how to install and operate your Monarch computer. The Monarch User's Guide provides the necessary information for attaching consoles, printers, and cables to your computer, and interpreting any diagnostic messages that may appear when the computer is turned on.

If you are new to microcomputers, we recommend that you read one of the many texts on basic computer concepts available at bookstores and computer stores. A glossary of terms is also provided in an appendix of your Monarch User's Guide.

The Monarch MP/M II User's Guide is organized into the following sections:

Section 1: Getting Started With MP/M II

This section will get you started with your new MP/M II operating system. It shows you how to format diskettes and hard disks, configure your system, make a copy of the MP/M II Distribution Diskettes and install MP/M II onto the Winchester hard disk from diskettes or cart-

ridge tape. Once installed onto the hard disk, you may boot MP/M II directly from the hard disk.

Section 2: FORMAT

This section details how to format and configure diskettes and the Winchester hard disk. You may configure your hard disk drive(s) into multiple logical drives.

Section 3: DYNASYS and DYNASTAT

Section 3 details the DYNASYS utility that customizes your MP/M II operating system. It includes instructions for assigning logical disk drives, assigning character I/O devices, defining port setup parameter values, generating a new system and writing your new system to disk. DYNASTAT, also described in this section, displays your current system configuration.

Section 4: FILESAVE and BACKUP

Section 4 discusses the FILESAVE and BACKUP utilities that copy data to and from diskettes and hard disk drives.

Section 5: TAPE

This section describes the Dynabyte TAPE utility, and contains instructions for using cartridge tape media. It also provides detailed instructions for transferring (or backing up) files from the Winchester drive or diskettes to cartridge tape.

Appendix A summarizes the Dynabyte utilities that enhance MP/M II.

Appendix B acquaints you with the most commonly used MP/M II commands and provides examples of their use.

Appendix C describes how MP/M II handles the I/O handshaking lines.

Appendix D describes how to install an IPL PROM.

Appendix E is a User's Comment Form. We ask that you complete and return this form so that we can accommodate your information needs.

Documentation Conventions

The definitions and use of terms in this manual are consistent with those used throughout the microcomputer industry. We have also developed conventions to help you identify screen displays and user entries.

Screen Displays

This manual contains many examples of console screen displays. These displays are shown in bold type, for example:

```
DYNASYS Version N.NN - For Monarch MP/M II DVN.NN
MP/M II V2.2 System Regeneration Utility
```

User Entries

Pressing the RETURN key is represented as <CR>.

Pressing the ESCape key is represented as <ESC>.

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

```
MONARCH MP/M II DVN.N
0A>DIR<CR>
```

In the above display, the Monarch MP/M II version number is displayed first and then the MP/M II system level prompt ~~0A~~>. When you receive the system prompt, you may enter a command to the system. In the example above, the user has entered the DIRectory command by typing DIR and then pressing a carriage return.

1. GETTING STARTED WITH MP/M II

In most cases, your Monarch computer arrives without any software on the hard disk. We recommend that you transfer the operating system files from the Distribution Diskettes or the cartridge tape onto your hard disk system.

Depending on whether your distribution media is diskette or tape, follow the instructions in the appropriate section:

To Install From	Follow
Diskettes	Section 1.1
Cartridge tape	Section 1.2

1.1 Getting Started from Distribution Diskettes

This section will show you how to:

- 1) make backup copies of your Distribution Diskettes,
- 2) transfer your MP/M II software onto your Winchester hard disk, and
- 3) reconfigure your system to boot from the hard disk.

The two Dynabyte MP/M II Distribution Diskettes contain the complete MP/M II operating system and utility files. You should always use your backup copies whenever you need to boot from a diskette; retain your original diskettes for safekeeping.

When MP/M II is first booted from Distribution Diskette #1, drive A is automatically assigned to the floppy drive, drives B and C are assigned to the Winchester hard disk and drive D is assigned to the memory disk. Drive E is assigned to the second floppy drive in case you have added one to your Monarch.

The Dynabyte utility DYNASTAT displays your current system configuration. This is how the DYNASTAT command would display the original configuration:

Disk Drive Assignment
A:= F1
B:= WIN1
C:= WIN2
D:= MEM1
E:= F2

To have quick and convenient access to the MP/M II operating system on the hard disk, you need to be able to boot the system directly from your hard disk. To do this, you must reassign drive A to the Winchester hard disk.

The steps described below will change the drive assignments so that you will be able to boot from the hard disk. When you are finished, your new drive

assignments will look like this:

Disk Drive Assignment
A:= WIN11
B:= WIN12
C:= MEM1
D:= F1

You may wish to reconfigure MP/M II later in some other manner. This procedure describes a standard first-time installation for a Monarch computer with one 19MB Winchester hard disk.

Overview.

Section 1.1 covers the following steps:

1. Boot MP/M II from Distribution Diskette #1.
2. Format the Winchester hard disk.
3. Copy the MP/M II operating system and utility files onto the Winchester hard disk.
4. Log onto the Winchester hard disk.
5. Format two diskettes.
6. Copy the MP/M II operating system onto one of the formatted diskettes.
7. Copy the MP/M II utility files from the Winchester onto the formatted diskettes.
8. Reconfigure your disk drives.
9. Install MP/M II onto the Winchester hard disk.
10. Reboot MP/M II from the Winchester hard disk.

Before you begin.

- Always wait at least 30 minutes after the computer has been turned on before formatting a diskette or the Winchester hard disk. If you format a disk while the computer is cold, you may find errors when you attempt to

read the disk later.

- Be sure that you have read your Monarch User's Guide and properly installed your Monarch computer.
- You should have at least two blank diskettes on which to copy your Distribution Diskettes.
- Follow the steps below while you are at the console.

WARNING

It is very important that you do not alter the Distribution Diskettes. The steps in this section show you how to make a copy of the Distribution Diskettes. Use the copy for your work and store the originals in a safe place.

STEP 1 — Boot MP/M II from Distribution Diskette #1

1. Turn on the computer and the console. The computer will run a series of diagnostics, and then prompt you for the boot medium:

Boot Menu:

F - Boot Floppy H - Boot Hard Disk
T - Boot Tape R - Repeat Diagnostics

2. Insert Distribution Diskette #1 in the floppy drive and turn the lever down. The label on the distribution diskette should face up and the long open slot should point toward the computer.
3. Type F to boot from the floppy drive.

Your Selection? **F**
4. You will see the MP/M II operating system prompt **QA>**. Your system is ready to accept commands.

QA>

STEP 2 — Format the Winchester hard disk

FORMAT formats and checks the hard disk for any bad sectors. This example shows you how to format a system with one 19MB Winchester hard disk. Refer to Section 2 of this manual if you need to format other than one 19MB hard disk. For first time installation there should be no files on the hard disk.

1. At the system prompt (**QA>**), type:

0A>FORMAT<CR>

2. The FORMAT menu will appear on the screen and you will be prompted for a selection. Type FP to format the Winchester drive.

Your selection ? FP<CR>

3. You will be prompted for the number of physical drives to format.

Enter format option or <RETURN> to exit option: 1<CR>

4. You will see the screen display below. Press <CR>.

This option will ERASE EVERYTHING on the drive
that you have just selected.

Press <RETURN> to start format (any other key exits to menu)<CR>

5. Formatting will take about 10 minutes. When completed, the screen will display a bad track table and flag all the bad sectors. The operating system automatically substitutes good tracks for any bad ones which may be flagged. To accept the operating system's substitutions, type <CR>.

Enter one of the above options or <RETURN> to accept:<CR>

6. You will then see the Winchester configuration options menu. Select Option S to configure a single physical drive.

Enter configuration option or <RETURN> for main menu: S<CR>

7. Your next prompt will be for the number of logical drives on your system. Since you want option B (2 drives), press <CR>:

Select option or <RETURN> for option B: <CR>

When the message below appears, press <CR>:

Operation Complete, Press <RETURN> to resume: <CR>

You will then be returned to the Winchester Configuration Options menu.

8. Press <CR>. You will return to the FORMAT menu.

9. Select the EX option and press <CR> to return to the operating system prompt.

EX<CR>

STEP 3 — Copy the MP/M II files onto the Winchester hard disk

Distribution Diskette #1 should still be in the floppy disk drive. Use the

MP/M II PIP utility to copy the MP/M II files onto the Winchester.

1. Type:

```
ØA>PIP B:=A:*. *[OVR]<CR>
```

The screen will display the files as they are being copied onto the hard disk.

2. Wait until your console displays the system prompt ØA>.
3. Take Distribution Diskette #1 out of the floppy drive.
4. Insert Distribution Diskette #2 into the floppy drive and type the following command:

```
ØA>DSKRESET<CR>
```

5. Copy the files from Distribution Diskette #2 onto the Winchester hard disk.

```
ØA>PIP B:=A:*. *[OVR]<CR>
```

6. Wait until your console displays the system prompt ØA> and then remove Distribution Diskette #2 from the floppy drive.

STEP 4 — Log onto the Winchester

You will now need to work from the system files located on the Winchester drive (drive B). To log onto the Winchester drive, type:

```
ØA>B:<CR>
```

The system prompt will now look like this:

```
ØB>
```

STEP 5 — Format two diskettes

Remember that formatting a disk erases everything that is already on it. So be sure that the diskette you format doesn't have data on it that you need. Remember also that you can write on an 8-inch diskette only if the write-protect notch is covered.

1. Make sure that your Distribution Diskette #2 is not in the floppy disk drive.
2. Insert a blank diskette into the floppy drive. Insert the diskette with its label face up. If the diskette has no label, insert it with the smooth unseamed side up. This diskette must be in the drive before you try to run the FORMAT utility.

3. Type:

```
ØB>FORMAT A:SSL<CR>
```

where

A is the floppy drive
S designates single-sided diskette
S designates single-density
l designates 64 directory entries

Your system will confirm these values before prompting you to press the carriage return to start the actual formatting of the diskette.

4. Press <CR> to start the formatting. If FORMAT tells you that the diskette is bad, verify that it is in the drive properly and that the floppy drive door is closed completely. Try to format again. If this doesn't work, try another diskette.
5. When the format operation is complete, your console will display the message below. To return to the system prompt, type <CR>.

```
Format completed O.K., Press <RETURN> to continue:<CR>
```

You will see the system prompt again.

```
ØB>
```

6. Repeat steps 1 through 5 to format another diskette. Leave the newly formatted diskette in the drive.

STEP 6 — Copy the MP/M II operating system onto a formatted diskette

After you have formatted the two diskettes, you will make one of them a system diskette so that you can boot from it. This is done by using DYNASYS to copy the MP/M II operating system onto one of the diskettes you just formatted.

1. At the system prompt, type:

```
ØB>DYNASYS<CR>
```

2. Select the CD (Create System Disk) option of DYNASYS.

```
Enter menu item ? CD<CR>
```

3. Select the WR option from the Create System Disk menu.

```
Your selection ? WR<CR>
```

4. You will be asked where the system files are located and onto which drive they will be written.

(WR) System files Located on Disk Drive (A-P) ?B<CR>

Write System To Disk Drive (A-P) ? A<CR>

5. You will then be asked if you wish to accept the default parameters in GENSYS.

Do You Want To Accept All The Default Parameters In GENSYS (Y/N)? Y<CR>

6. You will be prompted to place the diskette in the drive:

Please Place Proper Disks In Drive, Then Press <RETURN> To Continue:

Press <CR> to start the formatting process. The system displays:

Please Wait. Writing System to Floppy Drive A.

7. The screen will then rapidly scroll during the GENSYS process. When the process is completed, you will see:

Press <RETURN> to Display Menu.

8. Press <CR> to return to Create System Disk menu.
9. Select the EX option and press <CR> to exit to the main DYNASYS menu.

EX<CR>

10. Select the EX option and press <CR> to exit to the operating system.

EX<CR>

You should see:

DYNASYS COMPLETE

ØB>

11. Leave the new system diskette in the floppy disk drive.

STEP 7 — Copy the MP/M II files from the Winchester hard disk to the formatted diskettes

You should still be logged onto the Winchester hard disk drive, as indicated by the ØB> prompt. Be sure also that your new diskette with the operating system is still in the floppy disk drive. Enter the following command exactly as shown because the spaces are very important.

1. ØB>SUBMIT COPY1 B A<CR>

Your screen will display the files as they are copied from the Winchester onto the diskette. When this is complete you will

receive the following message:

COPY1 complete

The system prompt will reappear:

OB>

2. Remove the diskette from the drive and label it COPY — MP/M II Disk 1 of 2 DVn.n, where n.n is the version number on the Distribution Diskette.
3. Insert the second formatted diskette into the floppy drive. Type:

OB>DSKRESET<CR>

OB>SUBMIT COPY2 B A<CR>

4. Your screen will display the files as they are copied from the Winchester onto the diskette. When this is complete you will receive the following message:

COPY2 complete

The system prompt will reappear:

OB>

5. Remove the diskette from the drive and label it COPY — MP/M II Disk 2 of 2.

STEP 8 — Reconfigure Your System

You will next reconfigure your system with DYNASYS so that MP/M II will boot directly from the Winchester hard disk. To do this, you must run DYNASYS to reassign the Winchester as logical drive A. You should still be logged onto the Winchester disk drive OB>.

1. Type:

OB>DYNASYS<CR>

2. Select the DA option from the main DYNASYS menu.

Enter Menu Item? DA<CR>

3. Select A when it asks you which drive you want to change.

Drive to change A-P (<RETURN> To Leave As Is)? A<CR>

4. The following prompts appear, line by line. Type in the indicated response.

```

A: = ? <RETURN> To Set To Null  WINI1<CR>
B: = ?  WINI2<CR>
C: = ?  MEM1<CR>
D: = ?  F1<CR>
E: = ?  <CR>

```

After you enter that last carriage return, the top part of the screen display should look like this:

```

A: WINI1
B: WINI2
C: MEM1
D: F1
E: F2

```

Since there is only one floppy drive, you should remove the E:F2 designation from the configuration. You will be prompted again for the drive to change.

```

Drive To Change A-P (<RETURN> To Leave As Is) ? E<CR>

```

```

E: = ? (<RETURN> To Set To Null) <CR>

```

The Winchester is assigned to two logical drives -- A and B -- because it was divided into two drives when you formatted it. The memory disk will now be drive C and the floppy drive on your Monarch will be drive D.

```

A: WINI1
B: WINI2
C: MEM1
D: F1

```

5. Press <CR> to confirm the new assignments. You will return to the main DYNASYS menu.

NOTE: These new assignments will not be in effect until the computer is reset (Step 10).

STEP 9 — Install a new system on the Winchester

You will now generate a new system onto the Winchester hard disk while you are still in DYNASYS.

1. From DYNASYS, you will be prompted to select a menu item.

```

Enter Menu Item ? CD<CR>

```

2. You will be prompted to select an option from the Create System Disk

Menu.

Your Selection ? WR<CR>

3. You will be asked where the source files are located and then onto which drive to write the new system. For the current configuration, the source and destination drives are the same.

(WR) Source Files Located on Disk Drive (A-P) ? B<CR>

Write System To Disk Drive (A-P) ? B<CR>

Do You Want To Accept All The Default Parameters In GENSYS (Y/N) ? Y<CR>

Please Wait. Writing system to Winchester Drive B.

5. Then it will display the files being copied and inform you:

****GENSYS DONE****

Press <RETURN> to display menu: <CR>

6. You will then return to the Create System Disk menu.
7. Press EX<CR> to return to the main DYNASYS menu.
8. Press EX<CR> to return to the operating system prompt. You will see:

DYNASYS COMPLETE

ØB>

STEP 1Ø — Reboot from the Winchester hard disk

You may now boot the system from the Winchester hard disk. The new system configuration that you entered in Step 8 will become effective when you boot from the hard disk.

1. Remove any diskette from the floppy disk drive.
2. Press the reset button on the rear of the computer.
3. The computer will run a series of diagnostics and prompt you for the boot drive. Select H to boot from the hard disk.

Your Selection ? H

4. You are now logged onto the Winchester hard disk, logical drive A.

ØA>

Your system is now configured as a four-drive system. Drives A and B are on the Winchester hard disk, drive C is the memory disk, and drive D is the

floppy disk drive. This can be seen from the following list of disk drive assignments, as it would appear using DYNASTAT.

Disk Drive Assignment
A:= WIN11
B:= WIN12
C:= MEM1
D:= F1

1.2 Getting Started from Cartridge Tape

To install MP/M II from cartridge tape to the Winchester hard disk, you must follow the steps in this section. You can run MP/M II from the Winchester hard disk only. You cannot run MP/M II from cartridge tape. MP/M II that is distributed on cartridge tape sets up your drive assignments like this:

Disk Drive Assignment
A:= WIN11
B:= WIN12
C:= MEM1
D:= F1

You may wish to reconfigure MP/M II later in some other manner. This procedure describes a standard first-time installation for a Monarch computer with one 19MB Winchester hard disk. Note that the tape unit is not assigned as a drive. The tape unit does not provide on-line data storage, and so is not a drive. It is simply an external backup or load device.

Hardware Requirements.

To boot MP/M II from the cartridge tape, your Monarch must have an IPL (Initial Program Load) PROM, version 2.2 or higher, on the main logic board. See Appendix D if you need to install the IPL PROM.

Overview.

1. Boot MP/M II from cartridge tape.
2. Format the Winchester hard disk.
3. Copy MP/M II from cartridge tape to the Winchester.
4. Reboot MP/M II from the Winchester.

Before You Begin.

- Always wait at least 30 minutes after the computer has been turned on before initializing a tape or formatting the Winchester hard disk. If you format media while the computer is cold, you may find errors when you later attempt to read the disk or tape.
- Be sure that you have read your Monarch User's Guide and properly installed

your Monarch computer.

- Follow the steps below while you are at the console.

Follow the instructions below to boot MP/M II from cartridge tape, format the Winchester hard disk, copy MP/M II from tape to the Winchester hard disk and reboot MP/M II from the Winchester.

STEP 1 — Boot MP/M II from cartridge tape

1. Turn on the computer and the console. The computer will run a series of diagnostics and then prompt you for the boot medium.
2. Carefully insert the cartridge tape in the cartridge drive slot. The label on the cartridge tape should face up and the tape head point toward the computer.
3. Type T to boot from the tape.

Your Selection ? T

STEP 2 — Format the Winchester hard disk

You will be prompted to format the Winchester or to make the Winchester hard disk bootable. You will first format the Winchester. This example shows you how to format one 19MB Winchester hard disk. Refer to Section 2 of this manual if you need to format other than one 19MB hard disk. For first time installation, there should be no files on the hard disk.

1. Type FW to format the Winchester.

Enter menu item FW<CR>

2. The FORMAT menu will appear on the screen. Choose the FP option.

Your selection ? FP<CR>

3. You will be prompted for the number of physical drives to format.

Enter format option or <RETURN> to exit option: 1<CR>

4. You will receive the following warning. Press <CR>.

This option will ERASE EVERYTHING on the drive
that you have just selected.

Press <RETURN> to start format (any other key exits to menu) <CR>

5. Formatting takes about 10 minutes. When formatting is complete, the screen will display a bad track table and flag all the bad sectors. The operating system automatically substitutes good tracks for any bad ones

which are flagged. To accept the operating system's substitutions, type <CR>.

Enter one of the above options or <RETURN> to accept: <CR>

6. You will then see the hard disk configuration menu. Select option S.

Enter configuration option or <RETURN> for main menu: S<CR>

7. You will next be prompted for the number of logical drives on your system. Press a <CR>. You will be informed when the operation is complete.

Select option or <RETURN> for option B: <CR>

Operation Complete, Press <RETURN> to resume: <CR>

8. You will then be returned to the Winchester Configuration Options menu. Press <CR> twice. You will return to the FORMAT menu.

9. Select the EX option and press <CR> to return to the main menu.

STEP 3 — Copy MP/M II from cartridge tape to the Winchester

1. At the main menu, now select the WB option to write the MP/M II operating system and files onto the Winchester hard disk.

Enter menu item WB<CR>

2. The menu will ask you which operating system you want to write onto the Winchester hard disk. You must choose option 3, which generates an MP/M II system onto the Winchester.

Your Selection? 3<CR>

3. You will be informed when the operation is complete. Type <CR> to exit the WB option.

Please wait. Writing system.

Operation complete.

Press Return for menu. <CR>

STEP 4 — Reboot MP/M II from the Winchester

1. Remove the cartridge tape from the tape slot.
2. Press the reset button on Monarch's back panel.
3. The computer will run a series of diagnostics and prompt you for the boot drive. Select H to boot from the hard disk.

Your Selection ? H

4. You are now logged onto the Winchester hard disk, logical drive A. MP/M II is now ready to accept commands.

0A>

If you want any other configuration, you may use DYNASYS to change the defaults. See Section 3 for a complete description of DYNASYS.

Notes

2.0 FORMAT

Overview

FORMAT is the first utility you run on a new Monarch computer. FORMAT partitions the disks, providing a "map" for future disk access. You should need to format a disk only once -- when you first use it. FORMAT completely erases any previous data that may be on a disk.

Disk drives write data onto a disk and read information from them. MP/M II supports two kinds of disks -- 8-inch diskettes and Winchester hard disks. Both diskettes and Winchester hard disks must be formatted before you can use them. Diskettes are encased in a square plastic jacket and resemble flexible 45 RPM records. Winchester disks are invisible to the user since they reside inside the computer. Sections 2.1 and 2.2 discuss diskettes and Winchester disks. See Section 5 for information on using tapes.

When disks are formatted, some of the storage capacity is allotted to the operating system and the directory areas. Storage capacity refers to the maximum number of bytes that can be stored on a disk. A byte is equal to a single typed character. For example, a 200-word report takes up approximately 1 kilobyte (abbreviated as K) or 1,024 bytes of space. The formatted Winchester hard disk contains 16.68 megabytes (abbreviated as MB) or 16,000,000 bytes of storage capacity. The storage capacity of a formatted diskette is either 256K for single-density or 512K for double-density.

Logical versus Physical Drives

MP/M II distinguishes between logical and physical drives. The physical drive in your system is the actual Winchester hard disk. That Winchester, however, may be formatted into one or several logical drives. The idea of logical drives makes an operating system more versatile. Figure 2.1 illustrates the relationship between the physical and the logical drive.

FORMAT's Relationship to DYNASYS

In Section 1, you prepared your Winchester drive by booting from either diskette or cartridge tape. In general, you must first run FORMAT to choose the number of logical drives to set up on your Winchester drive, then you run DYNASYS to assign drive letters to each logical drive. If you booted from cartridge tape, however, these utilities were run automatically.

Compatibility between Operating Systems

When a disk is formatted by an operating system, it creates a directory area for that disk. Because the directory structures vary, disks formatted under one operating system often cannot be read under a different operating system. The following guidelines apply to MP/M II:

- MP/M II can read disks formatted under another Digital Research operating system, such as MP/M-86, CP/M-80 and CP/M-86.

- MP/M II cannot read disks formatted under a non-Digital Research operating system without a specialized utility.
- The OASIS and UNI-DOL operating systems can read disks formatted under MP/M II if you use a special software utility.

System Warm-Up

Always wait at least 30 minutes after the computer has been turned on before you format a disk -- whether you use a floppy disk or Winchester hard disk. This allows time for the temperature of the computer to stabilize. If you format a disk while the computer is cold, you may find errors when you attempt to read the disk later.

Reformatting

Disks are rarely reformatted because doing so erases the disk's entire contents. FORMAT erases the system tracks, the directory, and all program and data files that may reside on the disk.

If data resides on a hard disk that must be reformatted, the disk must first be backed up. Some possible reasons for reformatting a hard disk are:

- System errors are detected on the Winchester drive
- The directory or data is damaged
- A new operating system will be installed on the hard disk

FORMAT provides an FL option that allows you to reformat a logical drive instead of the entire physical drive.

2.1 Diskettes

2.1.1 Description

Diskettes offer an inexpensive way to store data. They also allow data to be easily transported because they are small and light. Unlike the Winchester hard disk, they can be removed from the computer. They provide virtually unlimited data storage capacity since you can always buy more diskettes.

A diskette is magnetically coated on both sides. Its plastic jacket has a slot through which the drive's read and write mechanism can reach the magnetic surface. The disk drive engages and moves the magnetic medium through a hole in the jacket. A notch on the edge of the jacket indicates whether or not the disk can be written on. If the notch is covered on an 8-inch floppy, then data can be stored or "written" onto the diskette. If the notch is uncovered, the disk is "write protected" and cannot be written to.

All Monarch floppy disk drives are 8-inch single-sided drives. You should use only single-sided diskettes in your Monarch disk drives. The diskettes themselves may be formatted either double-density or single-density, depending on

the diskettes you buy.

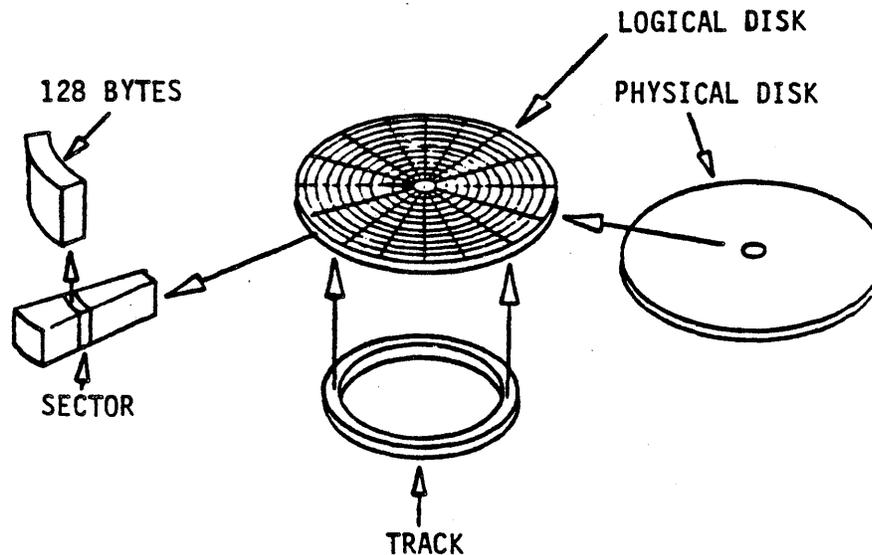


Figure 2.1
Physical Disk and Logical (Formatted) Disk

Each sector on a formatted disk has a "header", which is a preliminary space into which a location address for the track and the sector is written. This allows information stored on the diskettes to be located.

The formatted storage capacity for each single-sided 8-inch diskette is:

Single-density:

77 tracks
26 sectors per track
128 bytes per sector
256K formatted capacity

Double-density:

77 tracks
26 sectors per track
256 bytes per sector
512K formatted capacity

If you intend to format your disk as double-density, you must purchase an 8-inch diskette that is specified as double-density. Always remember to purchase certified media. Your Monarch User's Guide provides a list of certified brands.

2.1.2 Formatting Diskettes

The FORMAT utility is used to prepare a diskette for use by MP/M II. The density of a diskette and the maximum number of directory entries are also determined by the FORMAT utility. Remember that the FORMAT utility erases all data that exist on a diskette.

The following sections address the three ways you can use FORMAT on diskettes. You may format diskettes by:

Menu prompt	FORMAT prompts you with menus to set each formatting parameter.
Rapid Format	You specify all FORMAT parameters in one command line.
Standard options	FORMAT assigns default values to the formatting parameters.

2.1.3 Menu Prompt FORMAT

Insert the diskette to be formatted into the floppy disk drive and close the drive door. To invoke FORMAT, type FORMAT and press <CR>.

```
SA>FORMAT<CR>
```

FORMAT then asks you which option you want:

```
***** Monarch Format Utility Version X.XX For MP/M II DV1.X *****
```

```
FF) Format Floppy Disk  
FP) Format Physical Winchester Drive  
FL) Reformat Logical Winchester Drive  
CK) Check Drive Format  
EX) Exit Format Utility
```

Your selection ?

Enter FF to indicate that you want to format a diskette. You will then be asked to enter the drive letter of the floppy disk drive.

Floppy Format Option

Enter drive to format (A-P) or <RETURN> to exit to main menu:

If you are not sure which drive letter is assigned to your floppy drive, exit FORMAT and run the DYNASTAT utility. It will display your current system configuration. For more information on this utility see Section 3.

If you make an invalid response, you will receive one of the following error messages:

Invalid Reply
Drive Not On System
Not a Floppy Drive

If you have a single-sided drive, FORMAT next asks you to select single or double-density formatting. If you have a double-sided drive with a double-sided diskette inserted in it, FORMAT next prompts you for side selection.

2.1.3.1 Side Selection

The standard floppy disk drive on a Monarch computer is a single-sided drive. Unless you have added a double-sided drive to your system, the FORMAT utility will automatically format all single-sided diskettes as single-sided. If you have added a double-sided drive and if there is a double-sided diskette in that drive, then FORMAT will prompt for side selection. (Make sure that you are using double-sided diskettes.)

Side Selection

S - For Single Sided
D - For Double Sided

Enter side selection or <RETURN> for single sided :

2.1.3.2 Density

FORMAT next prompts you for density selection. All 8-inch drives on Monarch computers are capable of formatting either single or double-density.

The IBM standard format for an 8-inch diskette is single-density with 64 directory entries. A Monarch diskette formatted this way can be read by most 8-inch floppy disk systems from other manufacturers.

If you format your diskette for double-density, the diskette is in a non-standard format. Some other manufacturers' systems can read a Monarch double-density diskette, but some cannot. However, double-density provides you with twice the storage capacity on the same disk, so if the disk is going to be used exclusively on a Monarch computer, we recommend that you format it for double-density to gain the extra storage space. To select density, FORMAT prompts you with:

Density Format Selection

S - For Single Density
D - For Double Density

Enter density format or <RETURN> for Single Density :

You may enter S or D followed by <CR> to select the density you want to use, or just press <CR> to select single-density format.

2.1.3.3 Directory Entries

FORMAT now prompts for the number of directory entries to reserve on the diskette. You have a choice of 64, 128, or 256 directory entries. A directory is similar to a table of contents of a book. It tells MP/M II where files are located.

We recommend that you use 64 directory entries with single-sided, single-density 8-inch diskettes if you want them to be 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. We recommend the following number of directory entries for each configuration:

CONFIGURATION	NO. OF DIRECTORY ENTRIES
Single-sided, single-density	64
Single-sided, double-density	128
Double-sided, double-density	256

To determine the number of directory entries to reserve, FORMAT prompts:

NUMBER OF DIRECTORY ENTRIES

1 - For 64 Directory Entries
2 - For 128 Directory Entries
3 - For 256 Directory Entries

Enter # of directory entries or <RETURN> for 128 Entries :

Follow your choice with <CR>. Or you may simply press <CR> to select 128 entries.

After typing your entry, your selections are confirmed:

Floppy Drive X Selected For Format**Xxxxxx-Sided, Xxxxxx-Density, And nnn Directory Entries****Insert Disk To Format In Drive X****And****Press <RETURN> to format or <ESC><RETURN> to exit :**

Press return to begin formatting. FORMAT then displays a running count of each track as it is being formatted:

Formatting Track 00

If, during the format process, FORMAT finds a bad sector on the diskette and is unable to format it, the error is reported as follows:

Format Error on Track 00. Press <RETURN> For Menu

FORMAT will try several times to format that sector and if unsuccessful, will give up and report the above message. This usually indicates a damaged diskette. If this occurs, you will be returned to the Selection Confirmation display and prompted to insert a new floppy disk into the floppy drive. The damaged diskette should be removed and discarded. You may then insert the new diskette into the floppy drive. Press return, and FORMAT will then begin to format the new diskette with the options you have previously selected.

The screen will prompt you for another diskette to format. You may format multiple diskettes in this manner. To exit from the format routine, press the escape key and carriage return and then choose the exit option from the format menu.

2.1.4 Rapid FORMAT

The rapid FORMAT option allows you to specify the format parameters with a single line entry. To use this option, first insert the diskette to be formatted into the floppy disk drive and close the drive door. Type FORMAT, the drive letter of the floppy disk drive, a colon, and the codes that specify the parameters you want. For example, if you want to use floppy drive D to format a diskette as single-sided, double-density, 128 directory entries, enter:

OA>FORMAT D:SD2<CR>

The following chart presents all available FORMAT options and their codes.

FORMAT PARAMETER CODES

FORMAT OPTION	CHOICE AVAILABLE	CHARACTER (S) TO ENTER
1. Floppy Drive	Drive A through P	A: - P:
2. Side Selection	Single-Sided	S
	Double-Sided	D
3. Density	Single-Density	S
	Double-Density	D
4. Number of Directory Entries	64	1
	128	2
	256	3

For example, let's assume that your floppy disk drive is drive D and that you want to format a diskette in the IBM standard format. You will format your diskette as:

1. Drive D = D:
2. Single-Sided = S
3. Single-Density = S
4. 64 Directory Entries = 1

To format your diskette with these values, enter the FORMAT command and its parameters on the same line:

```
ØA>FORMAT D:SS1<CR>
```

For any other selection, refer to the FORMAT PARAMETER CODES above to determine the appropriate characters.

After typing your entry, your selections are confirmed. In the example used above, the console would report:

Floppy Drive D Selected For Format

Single-Sided, Single-Density, And 64 Directory Entries

Insert Disk To Format In Drive D

And

Press <RETURN> to format or <ESC><RETURN> to exit :

After pressing <CR>, your screen will display a running count of the tracks:

Formatting Track 00

Or you will receive a bad track message if a bad track is found. The FORMAT utility will notify you when the format has been successfully completed.

2.1.5 Standard Options FORMAT

The standard options procedure formats one or more diskettes as single-sided, single-density floppy disks with 128 directory entries.

To use this method, insert the diskette to be formatted into the floppy disk drive and close the drive door. Enter FORMAT, the drive letter, and a colon. For example, if your floppy disk drive is drive D, enter:

```
0A>FORMAT D:<CR>
```

Before the formatting is started, your default parameters will be confirmed:

Floppy Drive D Selected For Format

Single-Sided, Single-Density, And 128 Directory Entries

Insert Disk To Format In Drive D

And

Press <RETURN> to format or <ESC><RETURN> to exit :

When formatting is complete, you are prompted to either format another floppy disk or exit FORMAT.

To format another diskette with the same standard options, remove the previously formatted diskette, insert a new diskette into the floppy disk drive and press <CR>. You may continue this process until you have formatted all the diskettes you want formatted with the standard format option. When you are finished, press the escape key and <CR> and you will be returned to the operating system.

2.1.6 Aborting FORMAT

Before FORMAT informs you that it is formatting tracks, you may end the format procedure by pressing the escape key and then <CR>. The format procedure will be aborted and you will return to the main FORMAT menu.

2.1.7 Transferring Data Between Computers

You may easily transfer information stored by another computer, including a Dynabyte 5000 series computer, to a Monarch computer. Information stored on diskettes that are formatted to the IBM standard can be transferred between most computers. The IBM standard format is single-sided and single-density with 64 directory entries. The standard options FORMAT procedure described above automatically assigns these values.

If your information is currently stored on 8-inch single-sided diskettes formatted as single-density with 64 directory entries, simply use these diskettes on your Monarch system.

If your information is stored on 5.25-inch diskettes or 8-inch diskettes formatted for double-density or for any number of directory entries other than 64, use your Dynabyte 5000 series computer to copy the information onto 8-inch diskettes formatted for single-sided, single-density, 64 directory entries. If your Dynabyte 5000 series computer has only 5.25-inch floppy drives and no 8-inch floppy drives, consult your local Dynabyte dealer who has the proper equipment to copy your floppy disks.

2.2 Winchester Hard Disks

2.2.1 Description

Winchester hard disks can read data much faster and have a greater storage capacity than floppy disks. They are also more convenient in that they are housed inside the computer. You don't have to insert and remove them or physically file them.

The Winchester hard disk system is a 5.25-inch disk system. It is hermetically sealed with low flying recording heads that rest very close (approximately 20 micro inches) to the surface of the disks.

Your Monarch computer is capable of supporting up to four Winchester hard disk systems -- one in the main cabinet and three in the optional expansion cabinet.

The first track -- track 0 -- of a Winchester system is reserved for the operating system; the remaining tracks are used for directories, file storage and bad track substitution.

A single Winchester system in a Monarch computer contains three physical hard disk platters. 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 drives from the point of view of the Monarch computer. This process of dividing the space on a single Winchester system is referred to as "configuring" the disk (accomplished via the FORMAT program, which is described below).

The various configurations are designed to give you a range of choices suitable to your application. For instance, you may choose one large logical drive, two medium sized logical drives, or four smaller 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 best fitted to your application.

Winchester hard disks must be formatted before you can use them for storing information. Formatting a disk 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" -- each space is assigned a specific location on the disk. (See Figure 2.1) Both formatting and configuring a Winchester system are accomplished with the FORMAT utility.

2.2.2 Formatting Winchester Disks

Use the FORMAT utility to format the Winchester disk systems. To run FORMAT, enter FORMAT and <CR> after the system prompt:

BA>FORMAT<CR>

FORMAT displays the following main menu:

FF) Format Floppy Disk
FP) Format Physical Winchester Drive
FL) Reformat Logical Winchester Drive
CK) Check Drive Format
EX) Exit Format Utility

Your selection ?

Enter FP and <CR> to indicate that you want to format and check the physical Winchester drive (or drives) on your system:

Your selection ? **FP<CR>**

The following menu is then displayed:

Format Physical Winchester Drive

- 1) Physical Drive 1
- 2) Physical Drive 2
- 3) Physical Drive 3
- 4) Physical Drive 4
- All) All Physical Drives

Enter format option or <RETURN> to exit option :

Enter 1 followed by <CR> unless you have a disk expansion unit connected to your Monarch.

If you have more than one Winchester hard disk drive on your system, you may format all logical drives simultaneously by entering ALL and <CR>. Or, you may format any single Winchester drive by entering the number of the drive followed by <CR>. The Winchester drive that resides in your Monarch computer is physical drive #1. To determine the numerical assignment for additional Winchester drives, refer to the information accompanying your disk expansion unit.

Be very careful when entering your drive selection, because this FORMAT option will erase everything on the drive that you have selected. FORMAT will issue a warning before it actually begins to format the Winchester.

W A R N I N G

This option WILL ERASE EVERYTHING on the drive that you have just selected.

Press <RETURN> to start format (any other key exits to menu) :

Press a carriage return to begin formatting the Winchester. FORMAT displays a running count of the tracks as they are being formatted and checked.

Formatting Track 0000
Checking Track 0000

After the drives have been formatted and checked, the bad track table will be displayed. Do not be alarmed; this display requires no action. The FORMAT utility automatically scans the Winchester for bad sectors, places them in tables, reports them to MP/M II and substitutes good sectors in their place.

Winchester Bad Track Table						
Physical	1)	2)	3)	4)	5)	6)
Drive	7)	8)	9)	10)	11)	12)
1	13)	14)	15)	16)	17)	18)
	19)	20)	21)	22)	23)	24)
Physical	1)	2)	3)	4)	5)	6)
Drive	7)	8)	9)	10)	11)	12)
2	13)	14)	15)	16)	17)	18)
	19)	20)	21)	22)	23)	24)
Physical	1)	2)	3)	4)	5)	6)
Drive	7)	8)	9)	10)	11)	12)
3	13)	14)	15)	16)	17)	18)
	19)	20)	21)	22)	23)	24)
Physical	1)	2)	3)	4)	5)	6)
Drive	7)	8)	9)	10)	11)	12)
4	13)	14)	15)	16)	17)	18)
	19)	20)	21)	22)	23)	24)

"T*****" (Logical bad track number)
"D*,H*,C****" (Drive,head,cylinder number)

Enter one of the above options or <RETURN> to accept : <CR>

In the above display of the bad track table, no bad tracks are shown. Any bad tracks discovered by the FORMAT utility will appear after the track number which will be substituted for it. Pressing <CR> will accept bad track substitutions as presented in the Winchester Bad Track Table.

Tracks 1-24 are reserved for bad track substitution on each Winchester hard disk drive. Any bad track found during FORMAT will be substituted for one of these tracks. If any of these tracks (1-24) is bad, "65535" will appear after that track.

In addition to accepting the bad track substitution provided by the FORMAT utility, there are two ways to manually substitute good tracks for bad. To make a substitution for a physical track identified by drive, head, and cylinder number, enter "D" followed by the drive number, "H" followed by the head number; then enter "C" followed by the cylinder number. For example, if a bad track is identified by drive 1, head 2, cylinder 41, enter D1, H2, C41:

Enter one of the above options or <RETURN> to accept: D1,H2,C41

You may also make manual substitutions for logical tracks identified as bad tracks. For example, if you have identified track 68 as a bad track, enter "T68" and <CR>:

Enter one of the above options or <RETURN> to accept : T68<CR>

After your entry, "68" will appear next to "1" in the table, i.e.,

1) 68

After typing <CR> to accept the assigned bad track substitutions, or after manual reassignment of tracks, the FORMAT utility next asks you how you want to configure the Winchester.

2.2.3 Configuring the Winchester Hard Disk

The following menu is displayed:

Winchester Configuration Options

- S) Configure A Single Physical Drive Into One Or More Logical Drives
- M) Configure Multiple Physical Drives Into One Logical Drive

Enter configuration option or <RETURN> for main menu :

You are given two basic configuration options: the S option configures a single Winchester drive into one or more logical drives; the M option configures more than one physical drive into one logical drive.

2.2.3.1 Configuring A Single Physical Drive Into One Or More Logical Drives

If you select the S option, FORMAT will then ask you to select the logical drive configuration you want. The following menu is displayed:

 Single Drive Configuration Options

19MB HARD DISK DRIVE

- A) 1 DRIVE : 16.69MB : 2048 DIRECTORY ENTRIES
 B) 2 DRIVES : 8.34MB : 1024 DIRECTORY ENTRIES
 C) 4 DRIVES : 4.16MB : 512 DIRECTORY ENTRIES

Select option or <RETURN> for option B :

Enter A, B, or C to select a configuration or press <CR> to select option B.

2.2.3.2 Configuring Multiple Physical Drives Into One Logical Drive

If you select the M option, FORMAT will ask you which physical drives you want to configure as one logical drive. The following prompt is displayed:

Enter the number of each physical drive to configure,
 separated by commas (for example, 1, 2, 3, 4) ?

You may select any combination of physical drives to configure as a single logical drive as long as the drive numbers are consecutive. For example, in response to the prompt you may enter drives 2, 3, 4. You may not enter non-consecutive drives, such as 1, 3, 4.

Always separate the drive number entries by a comma, and press the carriage return after the last drive number entry.

The size and number of directory entries reserved depends on the number of physical drives you have selected to configure as a single logical drive. To determine the capacity of your new physical drive and the number of directory entries reserved for use, refer to the table below:

<u>Number of Drives</u>	<u>Formatted Capacity</u>	<u>Directory Entries</u>
2 19MB Winchester Drives	30.88MB	4096
3 19MB Winchester Drives	46.32MB	6144
4 19MB Winchester Drives	61.76MB	8192

FORMAT will display the actual capacity of the drives you have configured:

Selected drive contains XX megabytes

After you have configured your hard disk drive(s) using either the S or the M option, you will be returned to the original Configuration Options menu:

Winchester Configuration Options

- S) Configure A Single Physical Drive Into One Or More Logical Drives
- M) Configure Multiple Physical Drives Into One Logical Drive

Enter configuration option or <RETURN> for main menu :

If you have one or more remaining hard disks on your system that have not yet been configured, you may enter S or M and continue as described in the previous sections.

If you are finished configuring all hard disks, enter <CR> and you will be returned to the main FORMAT menu.

FORMAT will then ask you to select the logical drive configuration you want.

Single Drive Configuration Options

19MB HARD DISK DRIVE

- A) 1 DRIVE : 16.69MB : 2048 DIRECTORY ENTRIES
- B) 2 DRIVES : 8.34MB : 1024 DIRECTORY ENTRIES
- C) 4 DRIVES : 4.16MB : 512 DIRECTORY ENTRIES

Select option or <RETURN> for option B :

Option A, B and C determine the number and size of the logical drives on the Winchester hard disk. Pressing only <CR> will automatically give you option B.

After you have configured your hard disk drive, you will be returned to the original Configuration Options menu. Enter <CR> to exit to the main FORMAT menu.

2.2.4 Reformatting Logical Winchester Disk Drives

The FORMAT utility also provides an option to reformat a logical drive that has already been formatted. This option is especially useful for formatting a single logical drive on which you have received a hard disk error.

To use this option, first enter the FORMAT command and <CR>.

0A>FORMAT<CR>

FORMAT will then display the main FORMAT menu:

***** Monarch Format Utility Version X.JX For MP/M II DVLX *****

FF) Format Floppy Disk
FP) Format Physical Winchester Drive
FL) Reformat Logical Winchester Drive
CK) Check Drive Format
EX) Exit Format Utility

Your selection ?

Enter "FL" and <CR>. You will then be prompted for the letter of the logical drive you want to format:

Reformat Logical Winchester Drive

Enter logical drive to format (A-P) :

Respond with the letter of the drive to be reformatted, followed by <CR>. FORMAT will then warn you that use of this option will erase all existing information on the drive you have indicated.

W A R N I N G

This option will ERASE EVERYTHING on the drive that you have just selected.

To begin the formatting of the drive, press <CR>. The Reformat option will display a running count of each track as it is being formatted and checked:

Press <RETURN> to start format (any other key exits to menu) :

Formatting Track 0000
Checking Track 0000

When finished, the Reformat option will display the Winchester Bad Track Table:

Winchester Bad Track Table						
Physical	1)	2)	3)	4)	5)	6)
Drive	7)	8)	9)	10)	11)	12)
1	13)	14)	15)	16)	17)	18)
	19)	20)	21)	22)	23)	24)
Physical	1)	2)	3)	4)	5)	6)
Drive	7)	8)	9)	10)	11)	12)
2	13)	14)	15)	16)	17)	18)
	19)	20)	21)	22)	23)	24)
Physical	1)	2)	3)	4)	5)	6)
Drive	7)	8)	9)	10)	11)	12)
3	13)	14)	15)	16)	17)	18)
	19)	20)	21)	22)	23)	24)
Physical	1)	2)	3)	4)	5)	6)
Drive	7)	8)	9)	10)	11)	12)
4	13)	14)	15)	16)	17)	18)
	19)	20)	21)	22)	23)	24)

"T*****" (Logical bad track number)
 "D*,H*,C****" (Drive,head,cylinder number)

Enter one of the above options or <RETURN> to accept : <CR>

Press <CR> to accept track substitutions as displayed, or refer back to Section 2.2.2 to enter track substitutions manually.

2.3 The Drive Check Option

The Drive Check option verifies the format of both floppy and hard disks. This option reads each track on the disk and verifies that the disk is formatted correctly. Any errors on the disk are reported.

This operation does not write on the disk nor does it erase it. You may use the drive check option to verify a disk that has data on it. The integrity of the disk is maintained and you do not lose any data.

To use the Drive Check option, enter the FORMAT command followed by <CR>:

A>FORMAT<CR>

FORMAT then displays the main menu:

```
FF) Format Floppy Disk
FP) Format Physical Winchester Drive
FL) Reformat Logical Winchester Drive
CK) Check Drive Format
EX) Exit Format Utility
```

Your selection ?

Enter "CK" followed by <CR>. The Drive Check option will then be displayed:

Drive Check Option

Enter drive to check (A-P) or <RETURN> to exit to main menu :

Enter the letter of the drive you want to check and <CR>.

The Drive Check option will then report the type of disk drive you have selected to check and will inform you that the check is in progress:

Drive X is a nn MB Winchester Drive
Drive X is a nnn KB Floppy Drive

Check in progress
Press <ESC> to stop

The Drive Check option reports each track as it is being checked:

Checking Track 0000

If the option is completed with no errors found, your screen will display:

Check Completed OK. No errors were found.

Press <RETURN> for menu :

Pressing <CR> will return you to the main Drive Check menu and you can then check another drive or exit to the operating system.

If the FORMAT Drive Check option has found a bad track, it will print one or more error messages. The error message identifies the problem and prints out the track and sector number containing the error. For example, it may display:

Timeout error on Logical Track XX, Sector XX.

Any diskettes that have been identified as containing bad tracks should be discarded. Any hard disks identified as having bad tracks should be reformatted.

3.0 DYNASTAT and DYNASYS

The DYNASTAT utility displays the configuration tables that show the relationships between the physical and logical parts of your computer system. DYNASTAT also displays the system's current values -- baud rates, stop bits, parity, etc. The DYNASYS utility allows you to change these assignments to accommodate your particular system.

The MP/M II operating system supplied on your Distribution Diskettes is pre-configured to support four consoles and one printer plugged into the asynchronous ports on the back of the Monarch. You would need to use DYNASYS if you wish to add other character I/O devices or if your devices require other than the default parameters. You would also need to use DYNASYS if you want to change your logical disk drive assignments or create a bootable system disk. In GETTING STARTED (Section 1) you used the DYNASYS utility to change the logical drive assignments. This altered the original configuration loaded from the Distribution Diskettes so that you could boot from the Winchester hard disk.

Read this section carefully before using DYNASYS to change your system configuration. If you are changing the parameters for the character I/O devices, you may need your hardware manuals for specific information on baud rates, mask bits, parity, etc.

3.1 DYNASTAT

DYNASTAT is used to display the current assignments of character I/O devices, disk drives, and system parameters in MP/M II. DYNASTAT is especially useful for examining the system setup 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.

We recommend printing and saving a hard copy of the DYNASTAT display. This printed copy can be valuable if any problems arise. To obtain a hard copy of the configuration, simply press the CTRL and P characters at the same time. To deactivate the printer, press CTRL P again.

To run DYNASTAT, simply enter the command DYNASTAT and a carriage return. DYNASTAT will display all of the DYNASYS parameters and their current values, and then automatically return you to the operating system.

The following table shows the system parameters and the default values from the Distribution Diskette:

0A>DYNASTAT<CR>

DYNASTAT Version N.NN - For Monarch MP/M II DV1.X
MP/M II Vn.n System Status Utility

Console Assignment	Console Mask	Printer Assignment	Disk Drive Assignment	MEMORY SEGMENTS # BASE SIZE ATTR BANK
0= ASYN00	7	0= ASYN07	A:= F1	0= 7F - 81 - 80 - 00
1= ASYN01	7	1=	B:= WINI1	1= 01 - 7E - 00 - 00
2= ASYN02	7	2=	C:= WINI2	2= 00 - C0 - 00 - 01
3= ASYN03	7	3=	D:= MEM1	3= 00 - C0 - 00 - 02
4=		4=	E:= F2	4= 00 - C0 - 00 - 03
5=		5=	F:=	5= 00 - C0 - 00 - 04
6=		6=	G:=	
7=		7=	H:=	
8=		8=	I:=	
9=		9=	J:=	
10=		10=	K:=	
11=		11=	L:=	
12=		12=	M:=	System Speed = 6 MHZ
13=		13=	N:=	
14=		14=	O:=	
15=		15=	P:=	

Press <RETURN> for next page

Asynchronous Ports					Synchronous Ports				
	Baud	Stop/B	Bits/C	Parity	Baud	Stop/B	Bits/C	Parity	Clock
00)	9600	2	8	NONE	00)	9600	2	8	NONE INTERNAL
01)	9600	2	8	NONE	01)	9600	2	8	NONE INTERNAL
02)	9600	2	8	NONE	02)	9600	2	8	NONE INTERNAL
03)	9600	2	8	NONE	03)	9600	2	8	NONE INTERNAL
04)	9600	2	8	NONE	04)	9600	2	8	NONE INTERNAL
05)	9600	2	8	NONE					
06)	9600	2	8	NONE					
07)	9600	2	8	NONE					
08)	9600	2	8	NONE					
09)	9600	2	8	NONE					
10)	9600	2	8	NONE					
11)	9600	2	8	NONE					
12)	9600	2	8	NONE					
13)	9600	2	8	NONE					
14)	9600	2	8	NONE					
15)	9600	2	8	NONE					

RS-422 Communications Ports					
	Baud	Stop/B	Bits/C	Parity	Clock
00)	9600	2	8	NONE	INTERNAL
01)	9600	2	8	NONE	INTERNAL
02)	9600	2	8	NONE	INTERNAL
03)	9600	2	8	NONE	INTERNAL
04)	9600	2	8	NONE	INTERNAL

The first DYNASTAT screen displays five blocks of information. Each of these five blocks is described separately below:

- Console Assignments
- List (Printer) Assignments
- Disk Drive Assignments
- MP/M II Memory Segment Partition
- System Speed

3.1.1 Console Assignment

Under the "Console Assignment" heading are 16 lines of data, one for each console that can be assigned in MP/M II. They are represented by the numbers 0 through 15. After each console number appears the current assignment for that console. These assignments take the form of mnemonics, and are the same as those used with the CA option of DYNASYS (see Section 3.4.3):

Console Assignment
0= ASYN00
1= ASYN01
2= ASYN02
3= ASYN03
4=
5=
6=
7=
8=
9=
10=
11=
12=
13=
14=
15=

ASYN00 - ASYN15 = Asynchronous Serial Ports
 SYNC0 - SYNC4 = Synchronous Serial Ports
 COMM0 - COMM4 = Communication Ports

3.1.2 Console Mask

The Console Mask display appears next to the Console Assignment display. A mask setting will appear for every console assignment that has been made. In the example below, console numbers 0, 1, 2, and 3 are assigned the mask default value of 7.

Console Mask
7
7
7
7

3.1.3 Printer Assignment

Under the "Printer Assignment" heading are also 16 lines of data, one for each of the 16 possible printers that can be installed in MP/M II. They are represented by the numbers 0 through 15. 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:

Printer Assignment
0=
1=
2=
3=
4=
5=
6=
7=
8=
9=
10=
11=
12=
13=
14=
15=

ASYN00 - ASYN15 = Asynchronous Serial Ports
 SYNC0 - SYNC4 = Synchronous Serial Ports
 COMM0 - COMM4 = Communication Ports
 PARA0 = Parallel Port

3.1.4 Disk Drive Assignments

Under the "Disk Drive Assignments" heading are sixteen lines of data, one for each of the sixteen logical drives that can be installed on the MP/M II 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 (see Section 3.4.6):

Disk Drive Assignment	
A:= WINI1	F1 - F2 = Floppy Disk Drives
B:= WINI2	WINI1 - WINI6 = Winchester (5.25")
C:= MEM1	MEM1 = Memory Disk
D:= F1	
E:=	
F:=	
G:=	
H:=	
I:=	
J:=	
K:=	
L:=	
M:=	
N:=	
O:=	
P:=	

3.1.5 MP/M II Memory Segments

The MP/M II Memory Segments display appears in the upper right-hand corner of the DYNASTAT display. This area is used to display the Base, Size, Attributes and Bank of the Memory Segments, as defined by the MP/M II system generation program, GENSY. The maximum number of lines that can be displayed is eight: one for each user and one for the operating system. For more information on the GENSY program, refer to Section 5, "System Generation" in the Digital Research MP/M II System Implementor's Guide.

MEMORY SEGMENTS			
#	BASE	SIZE	ATTR BANK
0=	7F	- 81	- 80 - 00
1=	01	- 7E	- 00 - 00
2=	00	- C0	- 00 - 01
3=	00	- C0	- 00 - 02
4=	00	- C0	- 00 - 03
5=	00	- C0	- 00 - 04

3.1.6 System Speed

The Z80B microprocessor in your Monarch computer can operate at either 4 or 6 MHz. The System Speed display shown in the lower right-hand corner of the DYNASTAT display shows the current operating speed.

3.1.7 Port Set-Up Parameter Values

The second DYNASTAT screen displays the parameter values for asynchronous, synchronous, and RS-422 communications ports.

For information on options available for setting values to asynchronous ports, refer to the DYNASYS AS option, Section 3.4.4.

For information on options available for setting values to MODEM ports and the RS-422 communication ports, refer to the DYNASYS SS option, Section 3.4.5.

Asynchronous Ports					Synchronous Ports					
	Baud	Stop/B	Bits/C	Parity	Baud	Stop/B	Bits/C	Parity	Clock	
00)	9600	2	8	NONE	00)	9600	2	8	NONE	INTERNAL
01)	9600	2	8	NONE	01)	9600	2	8	NONE	INTERNAL
02)	9600	2	8	NONE	02)	9600	2	8	NONE	INTERNAL
03)	9600	2	8	NONE	03)	9600	2	8	NONE	INTERNAL
04)	9600	2	8	NONE	04)	9600	2	8	NONE	INTERNAL
05)	9600	2	8	NONE						
06)	9600	2	8	NONE						
07)	9600	2	8	NONE						
08)	9600	2	8	NONE						
09)	9600	2	8	NONE						
10)	9600	2	8	NONE						
11)	9600	2	8	NONE						
12)	9600	2	8	NONE						
13)	9600	2	8	NONE						
14)	9600	2	8	NONE						
15)	9600	2	8	NONE						

RS-422 Communications Ports					
	Baud	Stop/B	Bits/C	Parity	Clock
00)	9600	2	8	NONE	INTERNAL
01)	9600	2	8	NONE	INTERNAL
02)	9600	2	8	NONE	INTERNAL
03)	9600	2	8	NONE	INTERNAL
04)	9600	2	8	NONE	INTERNAL

3.2 Memory Disk

MP/M II provides a memory disk, which you may or may not want to use. A memory disk is a portion of the computer's internal memory that is configured as a disk. You can use the configured memory disk to temporarily store files for extremely high speed access. This disk actually resides in memory; if you use it, be aware that any time the system is reset or the machine loses power, any files on the memory disk will be lost. All files created on a memory disk should subsequently be stored on permanent media (the Winchester hard disk or floppy disks). Use of the memory disk is not recommended for critical data.

The memory disk is assigned during the DA (Drive Assignment) option of the DYNASYS utility. It is assigned in the same manner as a logical hard disk drive or a floppy drive.

The mnemonic for assigning a memory disk is MEM1.

The memory disk is assigned by default on the Distribution Diskettes. A DYNASTAT of assignments on the distribution media would show the drive assignments as:

Disk Drive Assignment
A:=F1
B:=WIN11
C:=WINI2
D:=MEM1

If you want to use the memory disk, we recommend that you assign MEM1 to a logical drive letter immediately following your Winchester disk logical drive assignments. For example, if your Winchester disk is configured for two logical drives, your assignments should be:

Disk Drive Assignment
A:=WIN11
B:=WINI2
C:=MEM1
D:=F1

The size of the memory disk is determined during boot. All memory that is not consumed by the operating system and your predefined user memory segments is assigned to the memory disk. If no memory is available for the memory disk and you try to use it, you will receive a select error on that disk.

3.3 DYNASYS Overview

The DYNASYS utility customizes the MP/M II operating system to your hardware. In GETTING STARTED (Section 1) you used the DYNASYS utility to change the logical drive assignments. You created a new system disk that reflected the new drive assignments so that you could boot from the Winchester hard disk. In this section, you will learn how to use DYNASYS to change your system configuration.

DYNASYS is a menu-driven utility with ten useful options. Each option is discussed in detail in Section 3.4. With DYNASYS you can alter system parameters when you add expansion units or additional consoles and printers to your Monarch computer. After running DYNASYS, you must reboot the system to implement the new DYNASYS configurations.

DYNASYS performs the following major functions:

- Creates system disks

A system disk boots or loads the MP/M II operating system into the computer's memory. The operating system resides on the outside tracks (0 and 1) of the floppy and on track 0 of the Winchester hard disk. Without an operating system in memory, you cannot access program or data files.

- Sets up system parameters

When you plug a character I/O device -- such as a printer or a terminal -- into the back of your Monarch, you must tell the operating system which port you have plugged the device into and what the device parameters are. DYNASYS allows you to set the parameters under which your I/O devices operate. After running DYNASYS, you must reboot the system to implement the new DYNASYS configuration.

- Assigns disk drives

DYNASYS assigns drive names to each logical drive set up by the FORMAT utility (Section 2).

- Maintains parameter files

When any system parameters are changed, DYNASYS will save these parameters.

- Displays configuration

DYNASYS displays the current system configuration. This allows you to check assignments before you actually create a new system disk. Each time a parameter is changed, the new configuration is displayed for verification.

To invoke DYNASYS simply type DYNASYS after the operating system prompt and the menu will appear on the screen.

0A>DYNASYS<CR>

**DYNASYS Version n.nn - For Monarch MP/M II DVn.n
MP/M II Vn.n System Regeneration Utility**

MAIN MENU OPTIONS

EZ)	Easy Configuration
AL)	Assign / Setup All Parameters
CA)	Character I/O Assignments
AS)	Asynchronous Port Setup
SS)	Synchronous Port Setup
DA)	Disk Drive Assignments
DC)	Display Current Configuration
LS)	Load / Save Parameter File
CD)	Create System Disk
EX)	Exit To Operating System

Enter menu Item ?

DYNASYS prompts 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. Once you are in a menu option, you will be prompted to set values for various system parameters.

Carefully study the function of each option before running DYNASYS. An incorrect configuration could prevent the new system disk from booting. Each of the menu items is discussed in detail later in this section, but first the function of each option is briefly described.

EZ) Easy Configuration

The EZ option allows easy configuration of your system. By using the EZ option you are not required to enter parameters for port assignments but rather accept the default parameters that have been set for the system. The EZ option will first prompt you with the CA (Character I/O Assignments) option. Here you will assign the physical ports to the CONSOLE and LIST logical devices. After making these assignments, the EZ option will direct you to the DA (Disk Drive Assignment) option, where you will assign the logical disk drives in your system. You will then be directed to the CD option, which will write your newly-created system to a disk. Finally, you will automatically be returned to the operating system.

AL) Assign / Setup All Parameters

The AL option successively invokes every menu option, starting with the CA option and progressing to the CD option. By guiding you through the steps, AL

gives you the opportunity to examine and change all system parameters.

CA) Character I/O Assignments

The CA option allows you to assign the physical ports to the character I/O logical devices. Up to sixteen physical ports may be assigned to the character I/O logical devices -- CONSOLE and LIST. Any default or previously established values will be displayed on the screen.

AS) Asynchronous Port Setup

The AS option is used to set up parameters for the asynchronous ports (the modular jacks on the back of Monarch). Options include baud rates, stop bits, bits per character and parity. Default assignments are displayed.

SS) Synchronous Port Setup

The SS option is used to set up parameters for the synchronous ports. There are two types of ports for synchronous character I/O devices: SYNChronous and COMMunications ports. The SYNC ports are for assigning devices to Monarch's RS-232 DB-25 port(s). The standard SYNC port is labeled MODEM on Monarch's rear panel. The COMM ports are for assigning devices to the RS-422 DB-15 port(s). The standard COMM port on Monarch's rear panel is labeled RS-422.

Options for SYNC and COMM ports include baud rates, stop bits, bits per character, parity and clock. Default assignments are displayed.

DA) Disk Drive Assignments

The DA option allows you to assign each of the up to 16 logical disk drives connected to the system. You may assign 8-inch floppy drives, Winchester drives, or the memory disk. Default or assigned drives are displayed.

DC) Display Current Configuration

On two screen displays, the DC option summarizes all of the DYNASYS parameters and their current values. This allows you to verify the parameters you have entered during the current DYNASYS program. You still have the opportunity to change any parameter values before you create a system disk or exit DYNASYS.

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. Alternatively, 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. Although the LS option will save all the specified parameters, it does not create a bootable disk.

CD) Create System Disk

The CD option creates a newly configured system disk that reflects the parameters you've specified in DYNASYS. The new system disk can then be used to boot MP/M II into the computer with the new parameters. The CD option also allows you to copy the boot portion, including all the DYNASYS parameters, from one disk to another.

EX) Exit to Operating System

When you are finished with the DYNASYS operation, the EX option returns you to the operating system prompt. If you change any parameters without using either the CD or LS option to save them, the EX option asks you if you want to exit without saving the parameters.

3.4 The DYNASYS Utility

At the system prompt, type DYNASYS. After invoking the DYNASYS utility, the following menu will be displayed on your screen.

MAIN MENU OPTIONS

EZ)	Easy Configuration
AL)	Assign / Setup All Parameters
CA)	Character I/O Assignments
AS)	Asynchronous Port Setup
SS)	Synchronous Port Setup
DA)	Disk Drive Assignments
DC)	Display Current Configuration
LS)	Load / Save Parameter File
CD)	Create System Disk
EX)	Exit To Operating System

Enter menu item ?

3.4.1 The EZ Option: Easy Configuration

The EZ option allows easy configuration of your system. By using the EZ option you are not required to enter parameters for port setups, but rather accept the default parameters that have been set for the system.

The EZ option will first prompt you with the CA (Character I/O Assignments) option. Here you will assign the physical ports to the CONSOLE and LIST logical devices. Refer to Section 3.4.3 for more information on character I/O assignments.

After making these assignments, the EZ option will direct you to the DA (Disk Drive Assignments) option where you will assign the logical disk drives

connected to your system. Refer to Section 3.4.6 for information on the DA option.

Next, you will be directed to the CD (Create System Disk) option to write your newly created system to a disk. Refer to Section 3.4.9 for information on the CD option. You will then be returned to the operating system.

3.4.2 The AL Option: Assign / Setup All Parameters

The AL option sequentially invokes each of the other menu options (except EX, which exits DYNASYS). The CA option is invoked first, then DA and so on until CD is called.

The AL option prompts you for responses to each menu item. Thus, you do not have to return to the main menu after completing each option. If you are not familiar with the DYNASYS program and want to change parameter values, it is wise to use the AL option to be prompted through each option.

If you are using DYNASYS to reconfigure only a few 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 want to modify.

If the AL option is not used, you are returned to the main menu display after completing each option.

3.4.3 The CA Option: Character I/O Assignments

The CA option allows you to assign the physical ports on a Monarch computer to any logical device such as a terminal (CONSOLE) or printer (LIST). Up to sixteen assignments may be made to each type of character I/O device.

In DYNASYS, each physical port is given a mnemonic name. Monarch supports several different types of ports. Port ASYN00 corresponds to the asynchronous port labeled 00 on the back of the Monarch. Likewise, ports ASYN01 through 07 correspond to the respective physical ports. SYNC00 corresponds to the synchronous port labeled MODEM on the back of the Monarch. The COMM00 port corresponds to the standard high speed RS-422 (DB-15) port. The PARA0 is the parallel port (labeled PARALLEL I/O on the back of the Monarch).

Figure 3.1 below shows the relationship between the physical ports and their mnemonic names. Installing expansion boards adds additional physical ports onto the system and they are numbered accordingly.

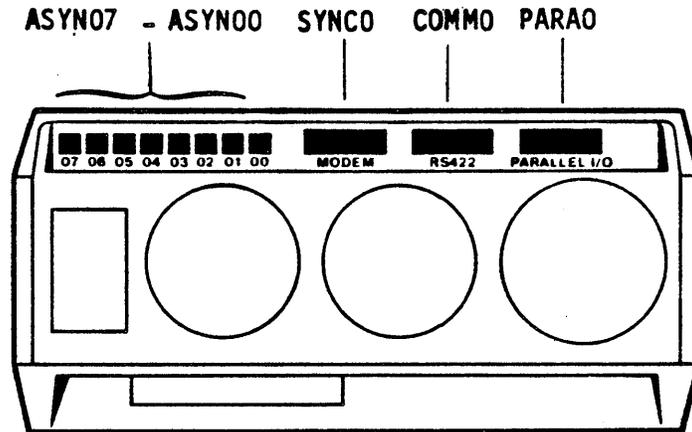


Figure 3.1
Monarch's Physical I/O Ports

You may assign any physical I/O device that your system supports to any logical device. You must, however, retain the $C0 = ASYN00$ default assignment. This is necessary to see the boot diagnostics and boot menu. You should also try to assign your consoles to the lower order ports and assign your printers to the high order ports. For example, on the Distribution Diskette, consoles are assigned to asynchronous ports $ASYN00$ through 03 and the printer is assigned to $ASYN07$. We also recommend that before starting the DYNASYS program, you carefully plan your port assignments and keep a record of them.

The menu provided by the CA option displays any default or previously established values. The following menu shows the default character I/O assignments provided on the Distribution Diskettes:

CHARACTER I/O DEVICE ASSIGNMENTS

Consoles	Mask	List Devices	
C0) = ASYN00	7	L0) = ASYN07	ASYN00-ASYN15 = Asynchronous Ports
C1) = ASYN01	7	L1) =	
C2) = ASYN02	7	L2) =	SYNC0 - SYNC4 = Synchronous Ports
C3) = ASYN03	7	L3) =	
C4) =		L4) =	COMM0 - COMM4 = Communication Ports
C5) =		L5) =	
C6) =		L6) =	PARA0 = Parallel Port
C7) =		L7) =	
C8) =		L8) =	
C9) =		L9) =	
C10) =		L10) =	
C11) =		L11) =	
C12) =		L12) =	
C13) =		L13) =	
C14) =		L14) =	
C15) =		L15) =	

Enter menu item to change (<RETURN> to leave as is) ?

Figure 3.2 shows the port assignments as provided on the Distribution Diskettes:

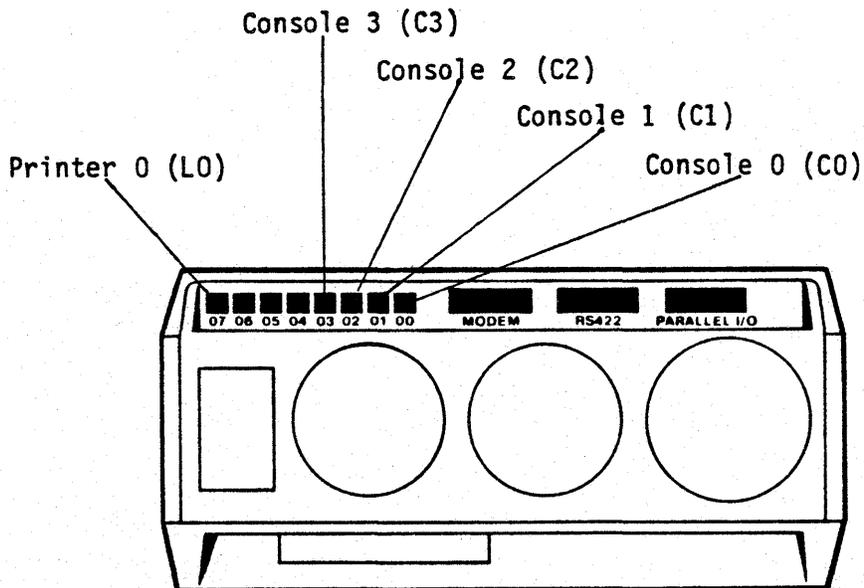


Figure 3.2
Default Physical Port Assignments

Any port can be assigned to any device, but can be used only if the hardware

is supported by the system. You may assign ports in any order and you do not have to assign every available port. For instance, you may use ASYN04 and ignore ASYN03. The system will not recognize any input or output from an unassigned port.

Let's assume in the following examples that, instead of the default system configuration, you want a system with three consoles and two printers. The new configuration would appear as below:

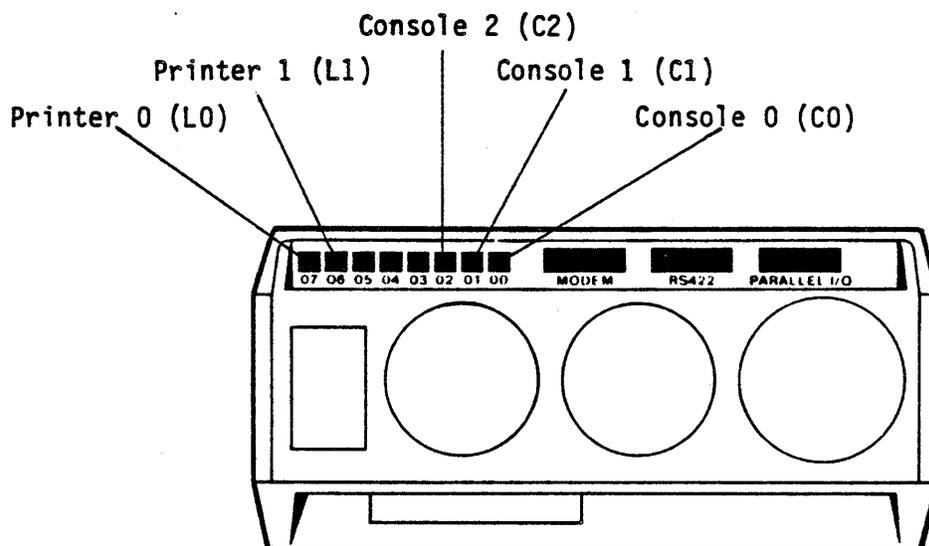


Figure 3.3
New Physical Port Assignments

To make a device assignment, enter the code for the logical device you want to assign or change. For example, to add a second printer to the original system configuration, you would assign ASYN06 to List 1. Enter the following in response to the prompt:

Enter menu item to change (<RETURN> to leave as is) ? L1<CR>

L1) = ? <RETURN> to set to null ASYN06<CR>

If you typed only a carriage return (the null option), then any port previously assigned to L1 would be de-assigned. The menu, when displayed, would show no assignment for L1. If, as shown above, you enter ASYN06 or any other physical port (followed by a carriage return), then you will be asked for the next logical device assignment (here, L2), and so on until you press only a carriage return in response to the prompt. (You will be given the null option only with the first logical device in the sequence.) When you respond with only a carriage return, the device assignment table will be displayed, reflecting any new assignments. In the above example, after typing ASYN06 and a carriage return, you will receive the following prompt:

L2 = ?

If you want to make one other assignment, ASYN05 to L2, enter ASYN05 (followed by a carriage return). Otherwise, in response to the above prompt, simply press a carriage return. The following table of device assignments will be displayed:

CHARACTER I/O DEVICE ASSIGNMENTS

Consoles	Mask	List Devices	
C0) = ASYN00	7	L0) = ASYN07	ASYN00-ASYN15 = Asynchronous Ports
C1) = ASYN01	7	L1) = ASYN06	
C2) = ASYN02	7	L2) =	SYNC0 - SYNC4 = Synchronous Ports
C3) = ASYN03	7	L3) =	
C4) =		L4) =	COMM0 - COMM4 = Communication Ports
C5) =		L5) =	
C6) =		L6) =	PARA = Parallel Port
C7) =		L7) =	
C8) =		L8) =	
C9) =		L9) =	
C10) =		L10) =	
C11) =		L11) =	
C12) =		L12) =	
C13) =		L13) =	
C14) =		L14) =	
C15) =		L15) =	

Enter menu item to change (<RETURN> to leave as is) ?

In our example, we will be using only three consoles. To remove the assignment for the fourth console (C3), enter the following in response to the prompt:

Enter menu item to change (<RETURN> to leave as is) ? C3<CR>

C3) = ? <RETURN> to set to null <CR>

In response to the prompt, simply press a carriage return. This will set C3 to null. The following table of device assignments will be displayed:

CHARACTER I/O DEVICE ASSIGNMENTS

Consoles	Mask	List Devices	
C0) = ASYN00	7	L0) = ASYN07	ASYN00-ASYN15 = Asynchronous Ports
C1) = ASYN01	7	L1) = ASYN06	
C2) = ASYN02	7	L2) =	SYNC0 - SYNC4 = Synchronous Ports
C3) =		L3) =	
C4) =		L4) =	COMM0 - COMM4 = Communication Ports
C5) =		L5) =	
C6) =		L6) =	PARA0 = Parallel Port
C7) =		L7) =	
C8) =		L8) =	
C9) =		L9) =	
C10) =		L10) =	
C11) =		L11) =	
C12) =		L12) =	
C13) =		L13) =	
C14) =		L14) =	
C15) =		L15) =	

Enter menu item to change (<RETURN> to leave as is) ?

Note that the new menu display reflects the assignments that were just made. The other logical devices may be assigned in a similar manner. When you have made all the assignments that you wish, enter only a carriage return in response to the above question. If the AL option is not in effect, you will return to the DYNASYS main menu.

In addition to assigning ports to a logical device, the CA option also allows you to assign a mask setting for consoles. The mask makes the input either 7 bits or 8 bits wide. If the port you are assigning is going to be connected to a standard CRT (console), the mask should always be set to 7. If the port is going to be used as a high speed communications port (for example, linking two computers), the mask should be set to 8. The default value for mask setting is 7.

If you want to change the bit mask assignments, specify the port as described below, but follow the port mnemonic by a comma and the mask value. For example, to set a mask of 8 to Console C3, enter ASYN03,8 in response to the prompt:

C3) = ? ASYN03,8<CR>

3.4.4 The AS Option: Asynchronous Port Setup

The AS option is used to set up parameters for the modular jack I/O ports on Monarch's rear panel. These ports are asynchronous serial RS-232 ports with RJ-12 connectors. The parameter values you can set for these ports are baud rates, stop bits, bits/character and parity. You should consult your hardware manual for specific information.

By using this option, you avoid having to change any hardware settings on your I/O devices. For example, if the printer you have assigned to ASYN07 runs at 1200 baud, you would need to change the baud rate parameter from the default of 9600 to 1200. The AS menu displaying the parameter values on your MP/M II Distribution Diskettes is shown below.

ASYNCHRONOUS PORT SETUP

ASYN Ports	Baud	Stop/B	Bits/C	Parity
A0) = ASYN00	9600	2	8	NONE
A1) = ASYN01	9600	2	8	NONE
A2) = ASYN02	9600	2	8	NONE
A3) = ASYN03	9600	2	8	NONE
A4) = ASYN04	9600	2	8	NONE
A5) = ASYN05	9600	2	8	NONE
A6) = ASYN06	9600	2	8	NONE
A7) = ASYN07	9600	2	8	NONE
A8) = ASYN08	9600	2	8	NONE
A9) = ASYN09	9600	2	8	NONE
A10) = ASYN10	9600	2	8	NONE
A11) = ASYN11	9600	2	8	NONE
A12) = ASYN12	9600	2	8	NONE
A13) = ASYN13	9600	2	8	NONE
A14) = ASYN14	9600	2	8	NONE
A15) = ASYN15	9600	2	8	NONE

Enter menu item to change (<RETURN> to leave as is) ?

To assign your own parameters for the Asynchronous Serial Ports, enter the letter and number corresponding to that port, beginning with the first port you want to reassign. To begin your assignments with the first port, enter A0 and a carriage return in response to the prompt:

Enter menu item to change (<RETURN> to leave as is) ? A0<CR>

Suppose that you want to change the assigned baud rate of port A0 to 19200. The following display will appear, and you would enter "19200". The number in parentheses is the default.

Baud rate = 50 75 110 134.5 150 300 600 1200 1800 2000 2400
3600 4800 7200 9600 19200

A0) Enter ASYN00 baud rate (9600) ? 19200<CR>

After entering a carriage return, you will then be asked to assign stop bits. The number shown in parentheses is the default. Pressing a carriage return will retain the default setting.

Stop Bits = 1, 1.5, 2

A0) Enter ASYN00 stop bits (2) ? <CR>

Assuming you don't want to change the number of stop bits, enter a carriage return. You will then be prompted for the number of bits per character to assign.

Bits per character = 5, 6, 7, 8

A0) Enter ASYN00 bits per character (8) ? <CR>

Enter the desired number of bits per character, or press the carriage return to leave the default value. You will be prompted for parity assignment:

Parity = NONE, EVEN, ODD

A0) Enter ASYN00 parity (NONE) ? <CR>

Enter the desired parity or press the carriage return to leave the default value. You have now finished assigning parameters for the asynchronous port 00. The Asynchronous Port Setups will automatically be redisplayed, but this time the display will reflect your new values.

To reassign parameters for A1 (ASYN01), you will be guided through the same steps you have just completed in the assignment of parameters for A0. After you have finished assigning parameters for each asynchronous port you want to set, enter only a carriage return in response to the "<RETURN> to leave as is" prompt. This will end the assignment of values to ports configured for your system.

Any ports (A0-A15) to which you have not assigned parameter values will retain the values as configured on the Distribution Diskette. You may leave all ports that are not configured for your system at default values. If you later add new character I/O devices to your system and the default values are not appropriate to that device, use the AS option to reassign parameter values for them.

3.4.5 The SS Option: Synchronous Port Setup

The SS option is used to set up parameters for the Synchronous I/O ports. The parameter values you may set for these ports are baud rates, stop bits, bits per character, parity and clock. The SS menu displays the default values as shown below:

SYNCHRONOUS PORT SETUP

SYNC Ports	Baud	Stop/B	Bits/C	Parity	Clock
S0) = SYNC00	9600	2	8	NONE	INTERNAL
S1) = SYNC01	9600	2	8	NONE	INTERNAL
S2) = SYNC02	9600	2	8	NONE	INTERNAL
S3) = SYNC03	9600	2	8	NONE	INTERNAL
S4) = SYNC04	9600	2	8	NONE	INTERNAL

COMM Ports	Baud	Stop/B	Bits/C	Parity	Clock
C0) = COMM00	9600	2	8	NONE	INTERNAL
C1) = COMM01	9600	2	8	NONE	INTERNAL
C2) = COMM02	9600	2	8	NONE	INTERNAL
C3) = COMM03	9600	2	8	NONE	INTERNAL
C4) = COMM04	9600	2	8	NONE	INTERNAL

Port SYNC00 corresponds to the physical port that is labeled MODEM on Monarch's rear panel. Ports SYNC01 through SYNC04 correspond to the four optional RS-232 ports provided by installing two dual RS-232 expansion boards (DB-25).

The COMM00 port corresponds to the standard high speed RS-422 (DB-15) port on the back of Monarch. Ports COMM01 through COMM04 are optional ports, provided by installing two dual high speed RS-422 boards (DB-15). Two ports are provided on each RS-422 expansion board.

The assignment of parameter values for synchronous ports is similar to the process of assigning parameters under the AS option. But note that parameter values for assignment of synchronous ports differ in some cases. For instance, the baud rate may be set to 800KB for COMM ports only. You will be prompted as follows:

Enter menu item to change (<RETURN> to leave as is) ? S0<CR>

To change the baud rate for the first port, enter S0 and a carriage return. You will then be prompted to assign parameter values in sequence. Again, suppose you want to assign a baud rate of 1200. The baud rate prompt will appear. Respond by entering "1200" and a carriage return. The number in parentheses is the default.

Baud rate = 50 75 110 134.5 150 300 600 1200 1800 2400
3600 4800 7200 9600 19200

S0) Enter SYNC00 baud rate (9600) ? 1200<CR>

You are then prompted for stop bits:

Stop Bits = 1, 1.5, 2

S0) Enter SYNC00 stop Bits (2) ?

Enter one of the stop bit values displayed in the table, or press the carriage return to accept the default value of 2 for synchronous ports. You are then asked to assign bits per character.

Bits per character = 5, 6, 7, 8

S0) Enter SYNC00 bits per character (8) ?

Enter one of the values displayed or press a carriage return to accept the default value. You are then asked to assign parity:

Parity = NONE, EVEN, ODD

S0) Enter SYNC00 Parity (NONE) ?

Enter the desired parity, or press the carriage return to accept the default value. You are then asked to assign the clock:

Clock = INTERNAL, EXTERNAL

S0) Enter SYNC00 Clock (INTERNAL) ?

Enter the desired clock assignment, or press the carriage return to accept the default value. You have now finished assigning parameters for the synchronous port SYNC00. The synchronous port setups will automatically be displayed, reflecting your new values.

Continue assigning values as you have done for S0. If at any point you want to stop assigning values to synchronous ports, enter only a carriage return in response to the "<RETURN> to leave as is" prompt. This will end assignment of values for SYNC ports configured for your system.

You may then assign parameter values for COMM ports (C0-C4). You will be prompted through all the parameters as you were during the assignment of parameters to SYNC ports. Note, though, that the parameter values for COMM ports differ from the parameter values for SYNC ports. For instance, COMM ports allow you to assign a much higher value (up to 800KB) for your baud rates. Once again, you will first be prompted for baud rate assignment. The number in parentheses is the default.

Enter menu item to change (<RETURN> to leave as is) ? C0<CR>

Baud rate = 50 75 110 134.5 150 300 600 1200 1800 2400
3600 4800 7200 9600 19200 800KB

C0) Enter COMM00 baud rate (9600) ?

Enter the desired baud rate, or press the carriage return to retain the default value. You are then asked to assign stop bits:

Stop bits = 1, 1.5, 2

C0) Enter COMM00 stop bits (2) ?

Enter the desired stop bits, or press the carriage return to accept the default value. You are then asked to assign bits per character:

Bits per character = 5, 6, 7, 8

C0) Enter COMM00 bits per character (8) ?

Enter the desired bits per character, or press the carriage return to accept the default value. Next you will be prompted for assignment of parity:

Parity = NONE, EVEN, ODD

C0) Enter COMM00 parity (NONE) ?

Enter the desired parity, or press the carriage return to accept the default value. You are then asked to assign the clock as internal or external:

Clock = INTERNAL, EXTERNAL

C0) Enter COMM Clock (INTERNAL) ?

Enter the desired clock assignment, or press the carriage return to accept the default value. You have now finished assigning parameters for the COMMUNICATIONS port C0. The COMM port setups will automatically be redisplayed, reflecting your new values.

To enter parameter values for the next COMMUNICATIONS port C1 (COMM01), enter "C1", and proceed as above. When you have finished assigning values for those COMM ports in your system, enter only a carriage return in response to the "<RETURN> to leave as is" prompt. This will end assignment of values for COMM ports.

Any ports not assigned parameter values will retain their default values. You may leave all ports that are not configured on your system at default value. If you later add new character I/O devices to your system, you have the choice of leaving the default values or using the SS option to reassign values for them.

3.4.6 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 floppy disk drives, Winchester disk drives, or the memory disk. Since drive A is the boot drive, you must assign drive A to either F1 or WIN11.

It is important to know how you divided your Winchester hard disk when you ran FORMAT. In the DA option of DYNASYS, you should configure your system to reflect the appropriate logical drives.

LOGICAL DISK DRIVE ASSIGNMENTS

Logical Disks

A: = F1	F1 - F2	= Floppy Disk Drives
B: = WIN11	WIN11 - WIN116	= Winchester Logical Drives
C: = WIN12		
D: = MEM1	MEM1	= Memory Disk
E: = F2		
F: =		
G: =		
H: =		
I: =		
J: =		
K: =		
L: =		
M: =		
N: =		
O: =		
P: =		

Drive To Change A - P (<RETURN> To Leave As Is) ?

To assign a drive letter to a logical drive, type the letter of the logical drive you want to assign. For instance, if you want to assign WIN11 to drive A, enter A in response to the above question. The following will then be displayed:

A: = ? <RETURN> To Set to Null

In response to the logical drive prompt, you may enter any of the following mnemonics that apply to your system:

F1	WIN11	WIN15	WIN19	WIN113
F2	WIN12	WIN16	WIN110	WIN114
MEM1	WIN13	WIN17	WIN111	WIN115
	WIN14	WIN18	WIN112	WIN116

Enter WIN11 and a carriage return:

A: = ? <RETURN> To Set To Null WIN11<CR>

Automatic sequencing through the logical drives occurs until you type only a carriage return in response to the prompt for a drive assignment (at which point the current assignments are displayed). For example, the following shows how the entries might be made for a system to be configured with four logical Winchester drives, one floppy drive and one memory disk.

B: = ? WIN12<CR>
 C: = ? WIN13<CR>

D: = ? WINI4<CR>
 E: = ? MEM1<CR>
 F: = ? F1<CR>
 G: = ? <CR>

LOGICAL DISK DRIVE ASSIGNMENTS

Logical Disks

A: = WINI1	F1 - F2	= Floppy Disk Drives
B: = WINI2	WINI1 - WINI16	= Winchester Logical Drives
C: = WINI3	MEM1	= Memory Disk
D: = WINI4		
E: = MEM1		
F: = F1		
G: =		
H: =		
I: =		
J: =		
K: =		
L: =		
M: =		
N: =		
O: =		
P: =		

The null option applies only to the first drive letter entered at the "Drive to Change" prompt.

3.4.6.1 Floppy Disk Drives

F1 and F2 are the two floppy disk drives that can be connected to your system. F1 will always be the floppy drive on which you boot the system. F2 will always be the second floppy drive on the system if you have two floppy drives.

3.4.6.2 Winchester Disk Drives (5.25")

Run the FORMAT utility before you assign logical drives to your Winchester hard disk. The FORMAT utility will automatically determine which size Winchester you have and will display the available options for your drive. The following table shows the possible configurations for the 19MB Winchester drive:

19MB WINCHESTER

Configuration A	Configuration B	Configuration C
WINI1 - 16.69 MB	WINI1 - 8.34 MB WINI2 - 8.34 MB	WINI1 - 4.16 MB WINI2 - 4.16 MB WINI3 - 4.16 MB WINI4 - 4.16 MB

Your Monarch computer allows up to four 19 MB Winchester disk drives to be attached to your system. For instructions on configuring Winchester hard disk drives, refer to Section 2, FORMAT.

3.4.6.3 The Memory Disk

The memory disk is a portion of memory that is configured as a disk. You can use the memory disk to store files for extremely high speed access. The memory disk will store a file for as long as the power is turned on and the computer is not rebooted. All files created on the memory disk should be backed up onto permanent storage media (floppy disks or the Winchester disk). It is not advisable to use the memory disk for critical data.

The size of the memory disk and its location in memory is dynamically allocated when you boot up MP/M II. To see how much memory has been allocated to your memory disk, use the STAT command (STAT drv:DSK:). See the Digital Research MP/M II Operating System User's Guide for more information on the STAT command.

For more information on memory disks, see Section 3.2.

3.4.7 The DC Option: Display Current Configuration

The DC option displays, on two screens, the DYNASYS parameters and their current values. With the DC option, you can verify the parameters that you have entered during the current DYNASYS session. If you want to change any values, you may simply recall the previous menu options by entering the appropriate two-letter combination.

The following DC display shows all the default parameters and values on your MP/M II Distribution Diskettes:

MP/M II Vn.n System Status Utility

Console Assignment	Console Mask	Printer Assignment	Disk Drive Assignment	MEMORY SEGMENTS # BASE SIZE ATTR BANK
0= ASYN00	7	0= ASYN07	A:= F1	0= 7F - 81 - 80 - 00
1= ASYN01	7	1=	B:= WINI1	1= 01 - 7E - 00 - 00
2= ASYN02	7	2=	C:= WINI2	2= 00 - C0 - 00 - 01
3= ASYN03	7	3=	D:= MEM1	3= 00 - C0 - 00 - 02
4=		4=	E:= F2	4= 00 - C0 - 00 - 03
5=		5=	F:=	5= 00 - C0 - 00 - 04
6=		6=	G:=	
7=		7=	H:=	
8=		8=	I:=	
9=		9=	J:=	
10=		10=	K:=	
11=		11=	L:=	
12=		12=	M:=	System Speed = 6 MHZ
13=		13=	N:=	
14=		14=	O:=	
15=		15=	P:=	

Press <RETURN> for the next page

Asynchronous Ports					Synchronous Ports					
	Baud	Stop/B	Bits/C	Parity	Baud	Stop/B	Bits/C	Parity	Clock	
00)	9600	2	8	NONE	00)	9600	2	8	NONE	INTERNAL
01)	9600	2	8	NONE	01)	9600	2	8	NONE	INTERNAL
02)	9600	2	8	NONE	02)	9600	2	8	NONE	INTERNAL
03)	9600	2	8	NONE	03)	9600	2	8	NONE	INTERNAL
04)	9600	2	8	NONE	04)	9600	2	8	NONE	INTERNAL
05)	9600	2	8	NONE						
06)	9600	2	8	NONE						
07)	9600	2	8	NONE						
08)	9600	2	8	NONE						
09)	9600	2	8	NONE						
10)	9600	2	8	NONE						
11)	9600	2	8	NONE						
12)	9600	2	8	NONE						
13)	9600	2	8	NONE						
14)	9600	2	8	NONE						
15)	9600	2	8	NONE						

RS-422 Communications Ports					
	Baud	Stop/B	Bits/C	Parity	Clock
00)	9600	2	8	NONE	INTERNAL
01)	9600	2	8	NONE	INTERNAL
02)	9600	2	8	NONE	INTERNAL
03)	9600	2	8	NONE	INTERNAL
04)	9600	2	8	NONE	INTERNAL

Type any key to continue

3.4.8 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 default values. Alternatively, the LS option 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 empty values.

We recommend using the LS option to save your parameters in a file so that the file can be later recalled with DYNASYS and the values easily reset. By saving your parameter file with LS, you do not have to reset all the DYNASYS parameters. This is convenient when there are only a few parameters that you want to change.

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) ?

3.4.8.1 The Load (LP) Option

In the following example, DYNASYS looks for and loads the file named PARAMTR.SYS (previously created with DYNASYS). The named file must have been previously created with DYNASYS; typing a nonexistent file name to the LP option (Load Parameter Area from a file) generates an error message.

Enter Menu Item (<RETURN> to exit to main menu) ? LP

Filename: ? WINDEM.UP
A:WINDEM .UP File not found

Filename: ? PARAMTR.SYS

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) ?

DYNASYS gives you another opportunity to use the LS option after completing one of its branches. The LS menu is again displayed, offering the three LOAD/SAVE choices.

3.4.8.2 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. For example:

Enter Menu Item (<RETURN> To Exit To Main Menu) ? SP

Filename: ? VALUES.SAV

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.

3.4.8.3 The Clear (CP) Option

CP (Clear Parameter Area) allows you to clear all port assignments to empty values. CP will leave NO assignments for character I/O and Disk Drive Assignments and all parameter values -- baud rates, stop bits, bits per character, parity, and clock -- will be set to default. This option is useful if you want to change the assignment of several character I/O and drive assignments. By using the CP option, you avoid having to change each individual assignment.

To protect you from inadvertently clearing values, CP issues a warning:

Enter Menu Item (<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) ?

CP executes only if a Y is typed in response to its query. After typing either Y or N, you are returned to the LS menu.

3.4.9 The CD Option: Create System Disk

With the Create System Disk (CD) option, you can create a newly configured system disk that incorporates the parameters you've specified during the current DYNASYS program. The CD option will ask for the source disk drive that contains all of the files needed to create a system disk. You are also asked to name the destination drive that contains the disk designated to be a system disk. The new system disk can then be used to boot MP/M II into the computer with the parameters set by the DYNASYS program. When the CD option is invoked, the following menu is displayed.

CREATE SYSTEM DISK

```
WR) Write System To Disk
TR) Transfer System From One Disk To Another
EX) Exit to Main Menu
```

Your Selection ?

3.4.9.1 The Write (WR) Option

Use the WR option when either the source or destination disk drive is a hard disk. To run the WR option, you must have the following files on the system file disk (disk A in the example below):

```
XIOS1.SPR   Winchester drive system
FPYMPM.LDR  For writing to a floppy disk drive
WINIMPM.LDR For writing to a Winchester drive
```

If WR tells you that a required file is missing, you must abort DYNASYS and copy (PIP) that file onto the source disk drive from the original distribution media. Then the WR option will execute successfully.

The following interaction shows how to use the WR option:

Your Selection ? WR<CR>

(WR) System Files Located On Disk Drive (A-P) ? A<CR>

This is only an example. You could have answered with any of the logical drives A-P that contain the appropriate files.

Write System To Disk Drive (A-P) ?B

The destination drive must be a logical drive from which you can boot.

Do You Want To Accept All The Default Parameters In GENSYS (Y/N) ?Y<CR>

Please Place Proper Disk In Drive, Then Press <RETURN> To Continue.

Please Wait. Writing System To Winchester Drive B

GENSYS is the MP/M II system generation program. For more information on the GENSYS program, refer to Section 5, "System Generation" in the Digital Research MP/M II System Implementor's Guide.

The GENSYS program now begins execution. When the GENSYS operation is complete, the following messages appear:

** GENSYS DONE **

Please Wait For DYNASYS To Finish

Press <RETURN> To Display Menu.

Press the carriage return, and the CD menu will be displayed.

CREATE SYSTEM DISK

WR)	Write System To Disk
TR)	Transfer System From One Disk To Another
EX)	Exit To Main Menu

Your Selection (or <RETURN> to exit to main menu) ?

3.4.9.2 The Transfer (TR) Option

Use the TR option when both the source and destination drives are floppy disk drives. You can use the TR option only if you have two floppy disk drives attached to your system.

(TR) Transfer System From Disk Drive (A-P) ? A<CR>

To Disk Drive (A-P) ? B<CR>

Please place proper disk in drive, then press <RETURN> to continue.

Now transferring system. Please wait.

Press <RETURN> to display menu.

Note that the use of A and B above are examples. A final carriage return will put you at the CD menu.

3.2.10 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 the CD 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:

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 complete

Typing N will return you to the main DYNASYS menu.

- 2) If you haven't made any changes or if you have saved your changes using the CD option:

DYNASYS complete

Notes

4.0 FILESAVE and BACKUP

This section describes the utility programs that are designed for copying data — FILESAVE and BACKUP. 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 which MP/M II copy utility to use for a specific copying task.

- The FILESAVE utility copies files of any size from the Winchester hard disk to diskettes. You can also use FILESAVE to copy back or "restore" files from diskette to the hard disk. FILESAVE works much like PIP — it can copy files individually, by groups, or by an entire user area — but it is faster than PIP. FILESAVE does not copy system tracks and copies from the current user area only. When FILESAVE copies files onto diskette, it writes over any files already on the diskette. When FILESAVE restores files to the hard disk, it appends the files to the hard disk and does not write over existing data. FILESAVE is described in Section 4.1.
- The BACKUP utility copies files of any size onto a Winchester hard disk or onto diskettes. Files copied from hard disk to diskette using BACKUP must be restored to the hard disk using BACKUP before they can be accessed. BACKUP gives you the option of copying track-by-track or file-by-file. BACKUP can copy files of any size and in all user areas of a disk, and can also copy system tracks. BACKUP is discussed in Section 4.2
- The PIP utility is the general-purpose MP/M II 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 system tracks. Appendix B, MP/M II COMMAND GUIDE, shows you how to use PIP.
- The TAPE utility 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. TAPE is discussed in Section 5.

FILESAVE and BACKUP were 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 should be backed up on a regular basis.

FILESAVE and BACKUP can also be used to store data that is infrequently accessed. These files can be copied from the hard disk to diskettes and the originals on the hard disk erased. This frees up a great deal of storage space on the hard disk. When the backed-up files are needed in the future, they can be restored onto the hard disk.

4.1 FILESAVE

FILESAVE allows you to save files from the Winchester hard disk to diskettes and to restore files to the hard disk. FILESAVE can copy files individually, by groups, or by an entire user area. FILESAVE is faster than PIP and is

especially useful if you are backing up an entire user area onto a set of diskettes. FILESAVE has the added advantage over PIP in that it can back up a file that exceeds the capacity of a diskette. Like PIP, however, FILESAVE does not copy system tracks.

FILESAVE differs from the BACKUP utility in several ways. BACKUP copies system tracks and can copy from diskette to diskette. BACKUP also gives you the option of copying track-by-track and can copy all user areas. However, files that are copied with BACKUP cannot be accessed until they are restored with BACKUP. When BACKUP restores files in the track-by-track mode, any files residing on the destination disk are lost. See the discussion on BACKUP for more information.

4.1.1 Using FILESAVE

Prepare yourself for using FILESAVE with the following steps.

1. Determine how many diskettes you will need. If the FILESAVE operation is interrupted for any reason, you must start again. So, if you run out of formatted diskettes before FILESAVE is completed backing up files, you will have to start the FILESAVE operation all over again after you have formatted more diskettes. It takes FILESAVE about 2.5 minutes to fill each diskette.
2. Format those diskettes if they haven't already been formatted. FILESAVE requires just over four single-sided single-density diskettes for each megabyte you back up from the Winchester hard disk drive. Diskettes may be single or double-density, depending on whether you want compatibility with other computer systems or extra storage capacity. You may use floppy disks that contain data you no longer want to save. FILESAVE will write over the old data. The set of diskettes needn't be formatted in the same way.
3. Know the drive letter for each Winchester logical drive you want to back up and for the floppy disk drive. FILESAVE will prompt you for the drive letter of the source and the destination drive. If you don't know the drive letters of your system, type DYNASTAT at the system level to view your current configuration.
4. FILESAVE copies only from the current user area. So before you invoke FILESAVE, log onto the user area containing the files you want copied. The USER command logs you onto a specific user area.

Invoke FILESAVE by typing FILESAVE at the system prompt. To back up files, type B in response to the main menu prompt.

0A>FILESAVE<CR>

Winchester Backup Utility Ver. N.N Copyright (c) 1983 Dynabyte Inc.

Menu Options

```
B) Back up From Winchester to Floppy
R) Restore From Floppy to Winchester
E) Exit Utility
```

Enter Menu Item ? B<CR>

You will be prompted for the drive letters of the source and destination drives and the file(s) to be copied. The following example assumes your system is configured according to the Getting Started instructions in Section 1. Drive A is on the Winchester hard disk, and drive D is the floppy drive.

To copy an individual file, type the file name and file type. To copy a group of files, use the wildcard symbols -- ? and * -- in the file name. For example, to copy only the command files, type *.COM. To copy all of the files from a logical drive on the Winchester, type *.*.

Enter Source Drive (A - P) or <RETURN> to exit: A<CR>

Enter Destination Drive (A - P) or <RETURN> to exit: D<CR>

Enter File Name ("?" and "*" allowed) or <RETURN> to exit: *.*<CR>

FILESAVE will warn you that this operation erases all files you may have on your diskette. Insert a diskette and press <CR> to continue or type an <ESC><CR> to exit the backup process.

W A R N I N G

This utility will ERASE ALL FILES on your floppy disk.

Insert floppy disk in drive D
and
Press <RETURN> to start or <ESC><RETURN> to exit:

A <CR> starts the copy process. As they are copied, the file names are displayed on the screen.

Backing up Files:

Disk 01 : DDT COM : DYNASYS COM : TAPE COM: FORMAT COM
FILESAVE COM : GENSYS COM :

When the first diskette is full, you are prompted to insert another floppy disk. FILESAVE will prompt you to insert as many floppy disks as needed to copy the files you specified.

Insert Disk 02 in Drive D and press <RETURN> when ready

Insert Disk 03 in Drive D and press <RETURN> when ready

FILESAVE numbers each diskette before it copies onto it. When you remove each diskette, label it. FILESAVE will not restore a set of diskettes if they are out of sequence. Keep the labeled set of diskettes together. If you lose one floppy disk from the set, you cannot use FILESAVE to restore the set.

FILESAVE tells you when it is done copying the files you specified. Type a <CR> to return to the main menu.

Backup Complete. Press <RETURN> for Menu:<CR>

4.1.2 Restoring Files

Files are typically restored from diskette to the Winchester with FILESAVE. You may also use PIP to restore an individual file from a diskette set. However, do not use PIP to copy the last file on a backup diskette. The last file may be continued onto the next diskette in the set.

A DIRectory command will display the number of the diskette and its file names. DIR will not, however, show the first file name if that file is continued from the previous diskette.

To restore your files from diskette(s) to the Winchester hard disk with FILESAVE, invoke FILESAVE from the destination user area and select option R from the main menu. You will be prompted for the source and destination drives and the file names to restore. In the following example, drive D is the floppy drive and drive A is on the Winchester hard disk.

0A>FILESAVE<CR>

Winchester Backup Utility Ver. N.N Copyright (c) 1983 Dynabyte Inc.

Menu Options

- B) Back up From Winchester to Floppy
- R) Restore From Floppy to Winchester
- E) Exit Utility

Enter Menu item ? R<CR>

Enter Source Drive (A - P) or <RETURN> to exit: D<CR>

Enter Destination Drive (A - P) or <RETURN> to exit: A<CR>

Enter File Name ("?" and "*" allowed) or <RETURN> to exit: *.*<CR>

Press <CR> to begin the restore operation. When prompted, insert your first backup diskette in the floppy drive and press <CR>.

Press <RETURN> to Restore

Or

Press <ESC><RETURN> to exit:<CR>

Insert backup disk 01 in Drive D and press <RETURN> when ready?<CR>

FILESAVE will inform you of its operation.

Restoring Files:

Disk 01 : DDT COM : DYNASYS COM : TAPE COM: FORMAT COM
FILESAVE COM : GENSYS COM : Backup end

Restore Complete. Press <RETURN> for Menu:<CR>

If you do not insert your diskettes sequentially, you will be prompted to insert the correct floppy disk. When FILESAVE tells you it is done restoring files, press <CR>. To exit to the operating system, select option E of the FILESAVE menu and press <CR>.

4.2 BACKUP

The BACKUP utility is used to create backup copies of data on hard disks or diskettes. 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 a set of diskettes:
track by track or file by file
- From a diskette set to hard disk:
(this copy is allowed only to restore a hard disk to diskette backup)
track by track or file by file
- From diskette to diskette:
(for systems with a second floppy drive addition):
track by track only
- From hard disk to hard disk:
track by track only

4.2.1 BACKUP versus PIP

The MP/M II 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 an MP/M II standard diskette that can be accessed by any MP/M II utility. BACKUP, when used from hard disk to diskette, creates nonstandard diskettes that can be accessed only by BACKUP to restore the data to hard disk.
- PIP cannot copy a file larger than 1MB. 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 system diskette, it must be used with the DYNASYS Create System Disk option because PIP cannot copy the loader (the outer two tracks). BACKUP, in track by track mode, copies the entire system diskette, including the loader.

This section first explains how to invoke BACKUP and transfer files from hard disk to diskette, since that is the most frequently used option. Then the two other BACKUP options -- hard disk to hard disk and diskette to diskette -- are

explained. Last in this section is a list and description of error messages.

4.2.2 Invoking BACKUP

You access BACKUP by typing BACKUP at the system level prompt. BACKUP must be run off-line. This means that there should be no other users on the system. 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>

***** MONARCH BACKUP UTILITY VER. X.X RUNNING UNDER MONARCH MP/M II DV1.X *****

**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 diskette, or restoring from diskette 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 diskette set, from hard disk to hard disk, or from diskette to diskette.

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
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 filename.typ is included.

4.2.3 Copying from Hard Disk to a Diskette Set

Copying from hard disk to a diskette 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 diskette, you will usually be working with several diskettes, called a diskette set, for one BACKUP job. Before you can back up files onto the diskettes, the diskettes 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 diskettes 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 diskettes that are created by hard disk to diskette BACKUP are "nonstandard" disks in that they do not have a standard file directory. On a diskette created with track by track mode, the directory command displays the following information:

```
      : MONARCH      : BACKUP      : 08/06/82      : DISK#01
```

This display tells you that the diskette is a MONARCH 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 diskettes created by hard disk to diskette 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 diskettes 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.

4.2.3.1 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 diskette 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 diskette 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 the 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.

4.2.3.2 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 ? F<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 = 19 MB Winchester	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 diskettes.

Archive date (MM/DD/YY)?

After you have entered the date, BACKUP tells you to insert the first diskette 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 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:

```

FPYLDL .PRL      00075 RECORDS
FUJLDL .PRL      00046 RECORDS
MMLDL  .PRL      00093 RECORDS
WINILD .PRL      00017 RECORDS

```

If all the files to be transferred will not fit on one diskette, BACKUP fills the first diskette, then pauses and requests the second diskette. For example:

Insert floppy disk #02 in drive E

Hit <RETURN> to continue....

After you insert the second diskette 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 diskette is needed, BACKUP again pauses and asks you to change diskettes. 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, MP/M, or Monarch utility except BACKUP. Therefore, the files thus copied cannot be accessed until they are restored to hard disk by BACKUP.

4.2.3.3 Restoring File by File, Diskette 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 diskettes in numerical order.

After you call BACKUP, the same options are presented. For backup diskettes created in file by file mode, you must select file by file mode, F, to restore to hard disk.

***** MONARCH BACKUP UTILITY VER. X.X RUNNING UNDER MONARCH MP/M II DV1.X *****

```

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 drive 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 = 19 MB Winchester	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 diskette.

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 diskette, 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.

4.2.3.4 Track by Track Copy

Track by track backup from hard disk to diskettes is very similar to the procedure just described for file by file backup. After you have formatted several diskettes and called BACKUP, you are presented with the same list of options.

*** MONARCH BACKUP UTILITY VER. X.X RUNNING UNDER MONARCH MP/M II DVL.X ***

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 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 = 19 MB Winchester	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 diskette is full. BACKUP asks you to insert the second diskette 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.

4.2.3.5 Restoring Track by Track, Diskette Set to Hard Disk

You can restore from diskette 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 diskettes on drive E to hard disk D.

*** MONARCH BACKUP UTILITY VER. X.X RUNNING UNDER MONARCH MP/M II DVLX ***

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 = 19 MB Winchester 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 diskettes are requested in sequence until all tracks are restored.

4.2.4 Copying between Like Devices

Copying from hard disk to hard disk and from diskette to diskette 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.

4.2.4.1 Diskette to Diskette Copy

For diskette to diskette 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.

*** MONARCH BACKUP UTILITY VER. X.X RUNNING UNDER MONARCH MP/M II DVLX ***

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....

Because only one diskette 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 diskette, with the same results.

4.2.4.2 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 diskette.

In the following example, the source drive is A and the destination drive is D.

*** MONARCH BACKUP UTILITY VER. X.X RUNNING UNDER MONARCH MP/M II DV1.X ***

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 = 19 MB Winchester Dir Entries = 0512
 Destination = 19 MB Winchester 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.

4.2.5 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, MP/M 1.1, OR MP/M 2.1

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 SECIOR FOUND ON SOURCE DRIVE *****

This error is caused by a physical media error on the source drive. If the source drive is a diskette, the disk is probably damaged in some way. There is no way to recover a diskette set if one of the disks is damaged. You should use the original diskette 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 SECIOR FOUND ON DESTINATION DRIVE *****

This error is caused by a physical media error on the destination drive. If the destination drive is a diskette, 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 diskette 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 diskette or diskette 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 diskette that was not created by BACKUP. To be restored by BACKUP, a disk must have been created by BACKUP. Locate the correct diskette or diskette 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 diskettes 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 diskettes, however. If you receive this error message, format a diskette 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 sized 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 diskette 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 diskette 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 diskette 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 diskette set to a hard disk. BACKUP is informing you that the hard disk directory is full and cannot restore any more files from the diskette 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 diskette to another diskette or from a hard disk to another hard disk. As the message indicates, a file by file backup can only be performed from a diskette to a hard disk or from a hard disk to a diskette. 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 can be used interactively, asking the user questions to determine which mode, source drive and destination drive to use. BACKUP can also be used in batch mode, 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 BACKUP conventions. 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.

Notes

5.0 TAPE

5.1 Description

Cartridge tapes facilitate data base storage and shipping. They also provide an easy and inexpensive means of storing backup copies of data, or storing files that are infrequently used.

The TAPE utility transfers data to and from cartridge tapes. TAPE allows you to back up or restore a single file or an entire disk with equal ease, at a rate of 2 minutes per megabyte of data.

TAPE's features include:

- Easy to use menu-driven command format
- Easy backup and restoration of data from a Monarch disk drive, either 8-inch floppy or hard disk
- Tape Directory display option
- Tape file to disk file Verify option
- Self-testing Initialize option

Data is organized on cartridge tape much as it is on a disk. An important difference, however, is that tape is a sequential access media. This means that you must access tape files in the order that they are stored on the tape medium. If the file you want has already passed the tape drive's read/write mechanism, the tape will need to be rewound before the file can be located by the TAPE utility. This is explained in the Tape to Disk Restoration option in Section 5.2.1. Like disk, tape allows you to refer to a file by name or by using wildcards (* and ?). See Section 5.7 for technical information on the tape data format.

5.1.1 Cartridge Tape Media

The tape media is sealed within a rectangular cartridge case. The tape feeds along one of the long edges of the cartridge. Insert the cartridge into the tape drive slot with this side toward the drive and with the cartridge label facing up.

TAPE uses cartridge tapes with a formatted capacity of up to 13.4 megabytes. Always use certified media. Your Monarch User's Guide provides a list of certified brands.

You may write-protect a tape to prevent someone from inadvertently overwriting its data. To write-protect a tape, turn the write-protect arrow to the safe position. Before you initialize a tape, make sure it is not write-protected.

5.1.2 Testing the Cartridge Tape System

The Initialize option (described in Section 5.2) performs a system self-test.

When you first use the TAPE utility you should select this option before anything else.

We suggest that you experiment with the various TAPE operations and perform initial testing with non-critical data. Some of the TAPE commands are potentially dangerous unless you thoroughly understand their behavior. Experiment with a blank tape and a backup floppy disk. We recommend that you follow the example sessions provided in Section 5.3.

5.1.3 Invoking Tape

Before you use the TAPE utility, insert your tape cartridge into the tape drive slot. TAPE is invoked by one of two calling methods:

TAPE or **TAPE d:filename**

Where:

d is an optional drive specification, and
filename is the name of a TAPE submission file.

The first method is used to invoke TAPE in its standard form. The second invokes TAPE with an executable instruction file. This is explained in Section 5.4.

When invoked in its standard form, TAPE displays a menu of the possible options, prompts for your selection, performs the task and returns to the menu. To abort execution of an option and return to the main menu, type <ESC>. If the program is aborted during a backup or restore, the data written is not necessarily valid and should be rewritten.

The following **TAPE COMMAND MENU** appears at the console:

CODE:	ACTION:
I	Initialize Tape
T	Retention 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.

5.2.1 TAPE Options

I - Initialize Tape

You must use the I option to initialize a tape before writing data to it. The Initialize Tape routine erases any data that was on the cartridge tape. In this respect, the Initialize option is like the FORMAT utility for disks.

The Initialize option also performs a series of tests on both the tape medium and the tape drive. If any errors occur during this procedure, TAPE provides you with Disk Status and Interface Status error codes. These errors are defined in Section 5.5.

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 restores 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 an executable instruction file. You may specify the source disk drive (A-P) and the user number (0-15), otherwise the current drive and user numbers are assumed.

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 will prompt you again for a file name. The tape is not rewound between file name inputs; the previously backed up data is not lost by specifying another file to backup. If the file you specify cannot be found on the disk, this condition is reported and the routine prompts you for another file name. When a carriage return is typed at the file name prompt, an end of data flag is written onto the tape. The program returns to the menu display while the tape is rewound.

If a tape is filled during a backup operation, a message appears requesting a new tape. The backup continues when a new tape is inserted.

WARNING

Backup should be run off-line -- no other user should be accessing any of the disk drives on the system.

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. This procedure gives two additional prompts. After you enter a filename, 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, the tape is rewound and the search commences from the beginning of the tape. If you respond N, the search is conducted from the current tape position to the end of data flag. You may also search for multiple files using a wildcard (* or ?) in the filename. However, the search always stops at the end of data flag. Any subsequent file search requires that the tape be rewound first.

You are asked if the source device should be ignored. When the data was originally written from disk to tape, the source drive (A-P) was stored as part of the tape header information (see Section 5.7.1). If you respond N, then only those tape files with a device code matching the current disk drive in use, whether by default or specification, are considered. If you respond Y, then all tape files will be considered, regardless of their device code.

You may also restore the entire contents of a cartridge tape. 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 with the Backup option.

A - Disk To Tape Append

The Disk To Tape Append searches for the end of the data flag on the tape, and starts backup procedures at this point. The Append function also increments the Save Set code by one, unless you specify otherwise. See Section 5.2.2 for an explanation of the Save Set feature. In all other respects this routine is the same as the Backup routine.

The Append function searches for the last track in use, starting with track 4. This reduces the average time required to locate the end of data flag on the tape.

A tape must be initialized (I) and at least one Disk to Tape Backup (B) must be done before Append can be used.

V - File Verification

The File Verification routine verifies a disk file against its counterpart on tape. You are prompted for the name of the file to verify. Your response can be a specific file name, or a name containing wildcards. We recommend that you precede the file name by a Control-P to allow any 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, then the screen will display the number of remaining bytes in the longer file and the ending byte value in the terminated file. After all bytes have been compared, you are prompted for another file name. The routine is terminated by entering a carriage return.

D - Tape Directory

The Tape Directory lists the name, type, source drive, user number and Save Set code 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 option copies data from the Monarch tape drive to another tape drive. Monarch does not support this option.

5.2.2 Save Set Feature

The Save Set feature allows you to save (and restore) multiple copies of a file with the same name on one tape cartridge. For example, suppose you wanted to keep backup copies of the inventory balance file -- INV.DAT -- at the end of every month. Normally, you can't have more than one file with the name INV.DAT on a single tape. To avoid having to use a different tape for each month, you can use the Save Set feature.

Save Set numbers are like user numbers -- you can assign a different Save Set number to each file. In order to access the file you want, you also have to designate the corresponding Save Set number. Save Sets are referred to by a two-digit hexadecimal number between 00 and 7F.

If you have no reason for using the Save Set feature, don't use it. The TAPE options Backup and Restore default to the 00 Save Set number if you don't designate otherwise. The Append function, however, automatically increments the Save Set number whenever you use it.

5.3 Examples

The two following examples show how TAPE responds to input. The first example shows how to invoke TAPE, 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.

First, boot your system. If you are booting from the Distribution Diskettes, boot from Diskette 1, replace it with Diskette 2 (the TAPE utility files are on Diskette 2) and type DSKRESET. Make sure a blank cartridge tape is not write-protected and insert it into the cartridge drive.

Example 1

In this example, we will put a backup copy of the TAPE.COM file from your system drive (Drive A) onto the tape cartridge. Insert the tape cartridge into the tape drive. At the system prompt, type TAPE:

QA>TAPE<CR>

The screen will display the following warning. Type <CR> to bring up the TAPE menu.

```
***** WARNING! *****
This Program Affects CPU Clock And Other Users
Type Cntrl C To Abort Or CR To Continue:<CR>
```

You will then see the main menu. Enter I to initialize the tape:

Monarch Tape Interchange Program - Version N.n

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

Do not hit a carriage return after entering the option. You should see the following warning. Type <CR> to begin initialization:

```
*** Warning - Tape Initialization Is Destructive ***
Type CR To Continue Or (ESC) To Abort:<CR>
```

When initialization is completed, you will see the main menu display again. Now type B for the Disk to Tape Backup option.

Monarch Tape Interchange Program - Version N.n

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

The following warning appears on the screen. Enter <CR> to continue.

```
*** Warning - Tape Backup Is Destructive ***
Type CR To Continue Or (ESC) To Abort:<CR>
```

You will be prompted for the Save Set code. Enter <CR> for the default value, 00.

Enter Save Set Code (CR For Default):<CR>

Now, enter the name of your disk file. In this example we will copy the TAPE command file TAPE.COM from the system disk onto the tape.

```
File Name (CR=Done):TAPE.COM<CR>
Copying from drive A, user 0 to Save Set 00:
TAPE      .COM
```

When the file is copied onto tape, you will be prompted for another file name. Enter <CR> to return to the TAPE command menu.

File Name (CR=Done):<CR>

Monarch Tape Interchange Program - Version N.n

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:

Press <ESC> to exit back to the operating system.

0A>

Example 2

In this example, we will APPEND files from the system disk onto tape, obtain a tape directory and restore a file from tape to disk. Make sure that your tape cartridge is in the tape drive. At the system prompt, type TAPE.

A>TAPE<CR>

The following warning appears on the screen. Type <CR> to continue:

***** WARNING! *****
 This Program Affects CPU Clock And Other Users
 Type CNTRL C To Abort Or CR To Continue:<CR>

You will then see the main menu. Enter A to append files:
 Monarch Tape Interchange Program - Version N.n

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

The program searches the tape to find the end of the last file. It will then display a new default Save Set code. You will be prompted for the Save Set code — you could specify a different Save Set. In this example, enter <CR> for the default:

```
Searching For End Of Data
Tape Positioned At End Of Data
New Save Set Default Is 01H
Enter Save Set Code (CR For Default):<CR>
```

In this example, we will append those files with the name "DUMP", regardless of type.

```
File Name (CR=Done):DUMP.*<CR>
```

```
Copying from drive A, user 0 to save set 01:
DUMP.PRL
DUMP.ASM
```

When the system prompts you for another file name, type <CR>.

```
File Name (CR=Done):<CR>
```

To view a directory of the files on tape, type D at the menu prompt.

Monarch Tape Interchange Program - Version N.n

CODE:	ACTION:
I	Initialize Tape
T	Retention 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

You should see:

Tape Directory Name	Type	Drive	User	SS
TAPE	.COM	A	0	00
DUMP	.PRL	A	0	01
DUMP	.ASM	A	0	01

Strike Return To Restart:

Notice that although we used the default Save Set number for both the backup and append operations, the append option automatically incremented the Save Set code for the appended files. Type <CR> to return to the main menu. At the menu prompt, type R.

Monarch Tape Interchange Program - Version N.n

CODE:	ACTION:
I	Initialize Tape
T	Retention 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

The system prompts you for the Save Set code. In this example, we will restore the file DUMP.PRL. As you saw in the tape directory display, this file has a Save Set code of 01. When prompted for the Save Set code, you must enter 01. Otherwise the system will not be able to locate the file.

Tape To Disk Restoration

Enter Save Set Code (CR For Default):01<CR>

At the file name prompt, enter DUMP.PRL

```
File Name (CR=Done):DUMP.PRL
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
DUMP	.PRL	A	Ø	Ø1

At the file name prompt, type <CR> to return to the main menu:

```
File Name (CR=Done):<CR>
```

Monarch Tape Interchange Program - Version N.n

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:

At the menu prompt, press <ESC> to return to the system prompt.

5.4 Executable Instruction File

If you use the TAPE utility to backup your files on a regular basis, you may want to create an executable instruction file. Using a text editor, you can create a file that contains the TAPE commands and responses that you would normally enter. TAPE processes these commands as if you were entering them from the keyboard. TAPE instruction files must have the file type '.TIP' (for Tape Interchange Program).

The following example demonstrates how to make a TAPE instruction file with the standard MP/M II editor, ED. This file "SAVEALL.TIP" initializes your tape cartridge and performs a Disk to Tape Backup of the file(s) you specify. At the end of each day you can insert a tape and issue the command "TAPE SAVEALL<CR>". This is how to make that file.

At the system prompt, enter:

```
ØA>ED SAVEALL.TIP<CR>      (create file with MP/M II editor)
*I<CR>                    (enter ED "input" mode)
l:<CR>                     (bring up TAPE menu)
```

```

2:I<CR>          (Initialize Tape + <CR> to continue)
3:B<CR>          (Backup + <CR> to continue)
4:<CR>           (for default Save Set of 00)
5:d1:file name1<CR> (source drive and name of files to be
6:d2:file name2<CR> backed up; user number may be specified;
                    wildcards may be used in file name)

```

etc.

```

n:<CR>           (end file name input)
n:<ESC>Control-Z (end TAPE utility; end ED "input" mode)
*E<CR>          (exit MP/M II editor)

```

0A>

You can create an instruction file to do any TAPE routine. However, as you see by the above example, you need to make sure that you account for all the TAPE prompts that may appear.

If the first line in an instruction file is AUTO, then TAPE will bypass all menu questions and proceed into the Append option. In executing this instruction, TAPE will increment the Save Set code by one, Append the specified files and then exit back to the operating system (if no errors are encountered). If you use this instruction file, be sure to read Section 5.2.2 on the Save Set feature. This is how to make the AUTO file:

```

0A>ED ADDALL.TIP (create file with MP/M II editor)
*I<CR>           (enter ED "input" mode)
1:AUTO<CR>       (AUTO as first instruction)
2:d1:file name1<CR> (source drive and name of files to be
3:d2:file name2<CR> backed up; user number may be specified
                    wildcards may be used in file name)

```

etc.

```

n:<CR>           (end file name input)
n:Control-Z     (end ED "input" mode)
*E<CR>          (exit MP/M II editor)

```

0A>

Before executing a TAPE instruction file, make sure you have a tape cartridge inserted in your tape drive. A TAPE instruction file is executed by entering TAPE with the instruction file name at the system prompt:

```
0A>TAPE d:filename<CR>
```

Where:

d is an optional drive specification, and
filename is the name of a TAPE instruction file.

Although the instruction file must have file type 'TIP', this need not be specified on invocation. However, the file must be stored under the current user number. If 'd' is omitted, the currently selected drive is assumed. This way of specifying files is standard in MP/M II.

5.5 Error Messages

If you enter an illegal file name or menu choice, TAPE displays an explanatory error message, and allows you to re-enter the information.

TAPE has three interfaces -- to the operator; to the operating system (for file operations) and to the hardware (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 pressing <CR>.

5.5.1 TAPE Error Messages

FILE NAME BAD, REENTER

UNEXPECTED END OF DATA

TAPE COMMUNICATIONS, SYNTAX REJECT WITHIN TAPE

TAPE ABORT WITH ATTEMPT

TAPE ABORT WITHOUT ATTEMPT

TAPE IS WRITE PROTECTED

FILE NOT FOUND

DISK FULL

5.5.2 Tape Abort Errors

If the error received was an 'ABORT' from the tape drive, TAPE 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.

Code	Meaning and Suggested Solution
00	Selected drive has executed auto-rewind since previous initialization or rewind command. Return to master menu or restart tape to clear error.
01	Write operation request to a write protected drive. Replace tape with an unprotected tape or remove write protection from present tape and reissue command.

02	Command issued to non-present drive or a drive with the cartridge removed. Be sure that the cartridge is properly seated in the drive and reissue the 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. Reinitialize the tape and try again. If problem 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. See code 08.
10	Read fail - short record error. See code 08.
11	Read fail - parity error. See code 08.
12	Write fail - R-A-W verify error. See code 08.
13	Write fail - read data not detected prior to record write operation completed. See code 08.
14	Read fail - file mark detected. Probable hardware, software, or tape error.

5.6 Preventive Maintenance

Follow these few simple rules while handling the magnetic tape media:

1. Be certain that no tape cartridge is in the drive while turning the computer on or off.
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!

4. When cartridge tapes are not in use, return them to their protective plastic containers. Store tapes on edge. This prevents the tape from slipping down on its spool and contacting the sides of the cartridge.

Three components of the tape unit require periodic maintenance to insure overall system reliability. The Monarch User's Guide explains how to clean the tape unit.

5.7 Technical Data

5.7.1 TAPE Record Format

Data is written to tape in 8208-byte blocks, allowing a full 8K data record (8192 bytes) with a 16-byte file control block (FCB) header. This configuration allows 17 megabytes (unformatted), 13.4 megabytes (formatted), 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 10^{10} . It is normal for the cartridge tape unit to rewrite 5 to 10 blocks per track.

The FCB header on tape takes the following format:

```

_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|
|US|F1|F2|/ /|F8|T1|T2|T3|SS|LB|SD|RC|
_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|_____|
00 01 02 ... 08 09 10 11 12 13 14 15

```

where:

US	Contains the user number, 00 - 0F hexadecimal
F1 - F8	Contain the file name in ASCII upper case, with the high bit equal to 0
T1,T2,T3	Contain the file type in ASCII upper case, with the high bit equal to 0
SS	Contains the Save Set number, 00 - 7F hexadecimal
LB	Contains the "LAST BLOCK" flag. This is true for the last tape block of a file only
SD	Contains the source device code 00 - 0F hexadecimal (corresponding to drives A - P)

RC Contains the number of 128 byte records in this tape block that contain active data.

5.7.2 Cartridge Drive Data Format

Storage Details

Data is stored bit/byte serial sequentially on 4 data tracks.

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)

5.7.3 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	TR1-	Controller	Track Select bit 0

- NOTE: 1) All odd numbered pins are returns.
 2) All signals are ACTIVE LOW.

**APPENDIX A
UTILITY SUMMARY**

The following list summarizes and briefly describes the Dynabyte utilities that enhance Digital Research's MP/M II. Each utility is invoked by typing its name at the system prompt level.

Utility	Description
BACKUP	Copies data between diskettes and hard disks. BACKUP copies files of any size and in all user areas of a disk. Section 4 describes the BACKUP utility.
DYNASTAT	Displays the current configuration of your operating system. DYNASTAT shows all current device and logical drive assignments and the values assigned to each port. Section 3 provides more information on this utility.
DYNASYS	Allows you to set system parameters and configure a new system disk. Section 3 describes DYNASYS.
FILESAVE	Copies data from the Winchester hard disk to diskettes and back again. FILESAVE can copy files of any size and can copy files individually, by groups, or by an entire logical drive. Section 4 describes the FILESAVE utility.
FORMAT	Formats and configures both diskettes and Winchester hard disks. This utility should be used with caution since it will erase all files on the disk. See Section 2 for a description of this utility.
TAPE	Transfers files between disk and cartridge tape systems. Section 5 describes the TAPE utility.

Notes

APPENDIX B
MP/M II COMMAND GUIDE

This guide is intended primarily for those users who are new to MP/M II and are not familiar with MP/M II commands and functions. It explains frequently used commands and functions that a new user should know.

There are many more MP/M II commands and options than are presented here. See your Digital Research Manual for additional commands and for a more extensive description of those presented here.

COMMAND OVERVIEW

All MP/M II commands are entered after the system prompt, and are followed by a carriage return. Every command either reports on files or acts on files that are contained on the drive on which the user is currently logged -- unless another drive is specified in the command line.

Listed below is a summarized description of commonly used commands. More detailed explanations of their use begins on page B-3.

DIR	DIRectory. Lists the file names in the directory.
ERA	ERAses. Erases or deletes specified files.
REN	RENames. Renames a specified file.
TYPE	TYPEs. Displays on the console, the contents of a file.
STAT	STATus. Lists the number of bytes of storage remaining on a currently logged disk, and provides information about particular files.
PIP	Peripheral Interchange Program. Copies files from one disk to another, or to the same disk under a different name. May also be used to send files from a disk to a printer or another peripheral device.

DSKRESET

Use the DSKRESET command to notify the system whenever you are changing diskettes in a drive. The DSKRESET command allows you to reset all drives or only one drive -- by specifying the letter of the drive you wish to reset. It is very important to use the DSKRESET command before you change a diskette in case another user has open files on that disk. For example,

QA>DSKRESET D:<CR>

Control Keys

The following commands are executed by simultaneously pressing the control key and a character key.

<CTRL> C	<CTRL> C aborts certain executions or application programs.
<CTRL> S	<p><CTRL> S will stop the scrolling of a display that is longer than your console screen. You continue scrolling by again pressing <CTRL> S.</p> <p>For example, if a directory listing is quite long, it may require more than one screen to display. To examine portions of the display more closely, you may want to temporarily freeze the scrolling. You can stop the directory listing at any time by entering <CTRL> S. To start the display listing again, simply enter another <CTRL> S and the listing will resume.</p>
<CTRL> P	<p><CTRL> P will turn on a list device - or printer. Everything that appears on your console screen, including what you enter, will be echoed on the printer. To stop the printing, enter another <CTRL> P.</p> <p>For example, you can print a hard copy of the directory listing that appears on your console screen. Press <CTRL> P before entering the directory command. The full directory will print on the printer to which you are attached. Enter another <CTRL> P to stop the printer from echoing console displays.</p> <p>This feature is especially useful if you intend to delete or erase files on a drive. The hard copy provides a working list of all files on your disk drive. You can then print another hard copy of the directory after you have erased the files and compare the two copies.</p>
<CTRL> H	<p>Deletes one character from the screen by moving the cursor one character to the left. This is also accomplished by pressing the BACKSPACE key.</p>
<CTRL> X	<p>Deletes the command line and returns the cursor to the beginning of the prompt.</p>

Wild Cards

A wild card is a character which means "match any character" in its location in the file name.

There are two types of wild card characters: "?" and "*".

A ? means match any one character in the current position. A * matches any series of characters in the current position. A * should be the last character in a file name or type since all characters following are ignored.

For example, if you would like a directory listing of all the .COM files on a drive, enter the wild card (*) followed by .COM after the DIR command:

```
0A>DIR *.COM<CR>  
0A: PIP          COM : DIR          COM  
0A: STAT        COM : DYNASYS     COM
```

DIR Command

DIR lists the names in the directory of a drive.

0A>DIR<CR>

Displays the directory of the currently logged drive -- drive A in this example.

0A:DIR B:<CR>

Displays the directory of a drive other than the one on which you are logged --drive B.

0A>DIR EXAMPLE.DOC<CR>

Confirms the existence of the file EXAMPLE.DOC on the currently logged drive -- drive A.

0A>DIR C:EXAMPLE.DOC<CR>

Checks -- or confirms -- the existence of a file on a drive other than the one on which you are logged. In this case confirms the existence of the file EXAMPLE.DOC on drive C.

If the file you are checking does not exist on the drive, you will receive the following message:

FILE NOT FOUND

Ⓐ>DIR *.PRL

Displays all files with the .PRL extension. The wild card (*) directs MP/M II to search for all files on the logged drive with the .PRL filetype.

ERA Command

ERA is used to ERase files from a disk.

Ⓐ>ERA EXAMPLE.DOC<CR>

Deletes the file EXAMPLE.DOC from drive A. If the file you are attempting to delete does not exist, the following message will be displayed:

NO FILE

Ⓐ>ERA C:EXAMPLE.DOC<CR>

Deletes a file from a drive other than the currently logged drive. In this case, deletes the file EXAMPLE.DOC from drive C.

Ⓐ>ERA *.DOC<CR>

Uses the wild card (*) to erase all files on drive A with the extension .DOC.

Ⓐ>ERA *.*<CR>

Uses the wild card (*) to erase all files on drive A. Use this form of the ERA command with great caution because it will erase all files on this drive.

To confirm that the file you want to delete has indeed been erased, use the DIR command.

REN Command

REN is used to REName a file on a disk. The form that is used to rename any file is:

REN newname.typ=oldname.typ<CR>.

Ⓐ>REN WORK.DOC=EXAMPLE.DOC<CR>

Changes the name of the file EXAMPLE.DOC to WORK.DOC.

TYPE Command

TYPE displays on the console screen, the contents of a file.

A>TYPE WORK.DOC<CR>

Displays the contents of the file WORK.DOC on the console screen.

STAT Command

STAT provides STATistical information about a disk or a file. STAT is useful for checking that a given disk has enough remaining storage space for your work.

A>STAT<CR>

Displays attributes and number of bytes remaining for all drives accessed since the last cold or warm boot.

A>STAT B:<CR>

Displays the number of bytes remaining on drive B.

A>STAT WORK.DOC<CR>

Displays the attributes and size of the file WORK.DOC. You may check a file on another drive by preceding the filename with the drive letter and a colon.

You may use wild cards in the filename or type.

PIP Command

PIP is used to copy a file from one disk to another disk or to a peripheral device.

If no command line is input when PIP is invoked, it will prompt (with an asterisk) for command lines. Exit PIP by pressing the carriage return.

The general form of a PIP command line is: destination = source

For example, the general form for copying a file from one drive to another is:

PIP D:copypname.typ=S:origname.typ

where:

D is the drive letter of the destination drive

S is the drive letter of the source drive

copyname.typ is the new name of the copied file

origname.typ is the source file from which a copy is made.

#A>PIP B:PAYROLL.DOC=A:WEEKLY.TXT<CR>

Copies and renames the file WEEKLY.TXT which is on drive A to drive B with the new name PAYROLL.DOC. The original file WEEKLY.TXT still exists on drive A.

#A>PIP C:=B:TOTALS.DOC<CR>

Copies the file TOTALS.DOC from drive B to drive C, assigning it the same name.

#A>PIP A:=D:* .DOC<CR>

Copies all files with the file type .DOC to drive A from drive D.

In all forms of the PIP command, optional parameters can be specified to perform special functions. A summary of parameters commonly used with PIP is shown below.

Gn	Gets files from user area n and transfers to another user area.
N	Adds line numbers to each line being copied.
Pn	Causes a page (form) feed after every nth line.
R	Used to copy system files.
Tn	Sets a tab stop at every nth column.
V	Verifies the copied file by comparing it to the source file.
O	Ignores the physical end-of-file for object file transfer of non-ASCII files.

Parameters are enclosed in square brackets following the command. As many parameters as needed may be strung within the brackets.

#A>PIP B:=D:STAT.COM|V|<CR>

Verifies the copied STAT.COM file by comparing it with the source file.

@A>PIP A:=B:WORKFILE[G3]<CR>

Gets the file WORKFILE from user area 3 on drive B and copies it with the same name to drive A in the current user area 0.

Using PIP to print a file

Two forms of the PIP command can be used to send a file from a drive to peripheral device. The two forms of the PIP command used to send a file to a printer are:

PIP LST:Copyname.typ

Your file is printed without tab expansions or form feeds

PIP PRN:Copyname.typ

Your file is printed with every line numbered sequentially, every tab expanded to 8 columns, and a forced page feed after every 60th line.

Parameters can be specified when using this form of PIP in the same manner as they are used when sending a file from one drive to another.

@A>PIP LST:=WORKFILE.ASM<CR>

Prints (lists) the file WORKFILE.DOC on the printer to which your console is attached.

@A>PIP PRN:=WORKFILE.DOC<CR>

Prints the file WORKFILE.DOC on the printer and numbers every line in the file sequentially, expands the tabs to 8 columns, and forces a page feed after every 60th line.

Using the PRN form of PIP to print the file, WORKFILE.DOC is actually the same as using the LST form of PIP with the parameters as specified below:

@A>PIP LST:WORKFILE.DOC[NP60/T8]<CR>

Prints the file WORKFILE.DOC and adds line Numbers to each line being copied, causes a Page feed after every 60th line, and sets a Tab after every 8th line.

Notes

APPENDIX C I/O HANDSHAKING LINES

For a full listing of all signal lines for each type of peripheral port on Monarch, refer to Appendix C of the Monarch User's Guide. This appendix describes how MP/M II handles the I/O handshaking lines.

Asynchronous Ports (RJ-12)

CTS	Fully functional. Stops transmission when line goes false (low). Frequently connected to the DTR line of the I/O device.
RTS	Currently always high (+12V or true).

Parallel Ports (DB-25)

STB*	Data out strobe. Data is available to the peripheral device with active low pulse (approximately 5 microseconds wide pulse).
INSTB	Data in strobe. Latches input data.
ISPOL	INSTB polarity. Selects polarity of input strobe.
ACK*	MP/M II recognizes the acknowledge line from the I/O device to the parallel port. MP/M II will not output a character until it receives an ACK.
APOL	ACK polarity. Selects polarity of ACK strobe.
DATAV*	Data available. Data is available from Monarch when this signal goes true (low).
BUSY*	MP/M II does not support BUSY*.

RS-232 (DB-25) Ports

Currently not supported.

RS-422 (DB-15) Ports

Currently not supported.

Notes

APPENDIX D
INSTALLING AN IPL PROM

To boot MP/M II from tape requires a Version 2.2 or higher IPL PROM. The following steps tell you how to determine if your Monarch computer has the correct IPL PROM and how to install a new one if you need to.

To Determine if Your Monarch Has the Correct IPL PROM

STEP 1 — Unplug the computer

For added safety, make sure the power cord is unplugged and no diskette or cartridge tape is in the drive.

STEP 2 — Check the Existing PROM

1. Use a Phillips screwdriver to remove the two screws that secure the top cover to the sides. The screws are on each side panel, close to the front. Lift Monarch's top cover.
2. Locate the old IPL PROM at row N, column 20 (upper left-hand corner) on the main logic board — the largest board attached to the top cover.
3. If the label on the PROM says IPL PROM 2.2 (or higher), you needn't change the PROM to boot MP/M II from tape. Proceed to STEP 3.

If the IPL PROM is labeled a lower version than 2.2, you must replace the IPL PROM to boot MP/M II from tape. Contact your dealer or Dynabyte Customer Service for a new 2.2 or higher IPL PROM. Use your current PROM until it arrives.

STEP 3 — Close Monarch's top cover

1. Close the top cover.
2. Replace the two screws on the side panel.

To Replace a New IPL PROM

STEP 1 — Unplug the computer

For added safety, make sure the power cord is unplugged and no diskette or cartridge tape is in the drive.

STEP 2 — Remove the old IPL PROM

1. Lift Monarch's top cover. Use a Phillips screwdriver to remove the two screws that secure the top cover to the sides. The screws are on each side panel, close to the front.
2. Locate the old IPL PROM at row N, column 20 (upper left-hand corner) on the main logic board — the largest board attached to the top cover.
3. With one hand on the board to provide a ground, carefully wedge a flat-head screwdriver between the IPL PROM and its socket and gently lift up the PROM. Pull the PROM completely out of the socket and mark it with a small piece of tape as OLD. Set this PROM aside momentarily.

STEP 3 — Install the 2.2 IPL PROM

A small notch is printed onto the main logic board at one end of the PROM socket. Match that notch with the notch on one end of the 2.2 IPL PROM. With notches aligned, place the PROM into the PROM socket. Be careful not to bend the pins. Press down firmly on the PROM until it is seated in the socket.

STEP 4 — Make sure the IPL PROM is installed correctly

1. Close Monarch's top without replacing the two side screws.
2. Plug in the power cord.
3. Press Monarch's power switch on.
4. If installed and working correctly, the IPL PROM will display a series of diagnostic messages and a boot menu.

If powering on the computer or resetting it fails to display the IPL boot menu, check that the IPL PROM is securely and correctly installed. If successive attempts to get the boot menu fail, contact your dealer or Dynabyte Customer Service for a new 2.2 IPL PROM.

You will not be able to boot MP/M II from tape until you get a new 2.2 IPL PROM and install it successfully. Until you get a new 2.2 PROM, you may

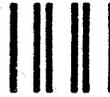
replace the PROM you removed earlier and marked with tape as OLD. This PROM will allow you to continue using MP/M II from diskette and the Winchester hard disk until the new 2.2 PROM arrives.

5. When the boot menu has been properly displayed after installing the new 2.2 IPL PROM, you should throw away the PROM marked as OLD. This will prevent any future confusion over revision levels of the IPL PROM.
6. Replace the two side screws.
7. You are now ready to boot MP/M II from tape. Section 1.2 describes how to install MP/M II onto the Winchester hard disk from cartridge tape.

Notes

Seal or tape all edges for mailing-do not use staples.

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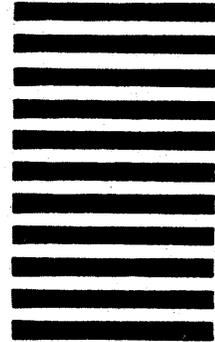
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