

**Rack Mount DECISION 1**  
**Installation Guide**

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**MORROW DESIGNS**

Decision I - Rack Mount  
Installation Guide

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# Decision I - Rack Mount Model

## Installation Guide

### 1. INTRODUCTION

This high performance, multi-user computer was designed to be flexible enough to suit the needs of a range of users - from single user systems to multi-user development stations. This compact but expandable system conforms to IEEE 696 standards for board connection. Its architecture also combines powerful hardware memory management with user-protection features to make your new system both flexible and dependable.

In addition to its flexibility and dependability, the Decision I Rack Mount is easy to install. This manual contains information that will guide you through installation. **It is important that you first read the manual, then go through again and begin the installation procedures.** More detailed information on the Decision I may be found in the technical manuals supplied.

#### 1.1. System Requirements

The Decision I supports up to three terminals and either a Centronics or daisy-wheel style printer in its standard configuration, though it is possible to run up to nine terminals and two printers with additional hardware.

The standard printer connection for the Decision I is a Diablo-style daisy-wheel printer. These printers offer high quality print at moderate speed and price and are well suited to a business environment. In systems where maximum speed is required, it is advised to purchase a serial or Centronics-style parallel line printer. Morrow Designs also supplies software programs for some of these more common printers.

The default baud rate for the operating system is 9600, (standard terminal baud rate) but most CRT terminals with an RS-232 type of interface can be connected to the Decision I, as can terminals with communication rates in the 110 to 19.2K baud range. The user is advised to obtain terminals which are suitable to his particular needs (and that meet the requirements mentioned above). The Decision I software can then be configured for the particular terminal.

## 1.2. System Software

The Decision I comes from the factory with a minimum of 65K of static memory and the necessary software for a 62K CP/M oriented system. Included with the system is a floppy diskette containing Morrow Design's version of CP/M for the Decision I.

Also supplied on this diskette are system utilities normally used with CP/M and Morrow Designs custom software which allows the user maximum use of the powerful hardware in the system. If your system has been configured with a Morrow Designs hard disk, all the necessary software to support this has been provided, as have diagnostic routines. (This software is described briefly in the appendix of this manual.)

The system diskette should be handled carefully as it contains valuable information magnetically encoded on its surface. Make a copy of this diskette and keep the original as a backup. Store both the original and the copy in a safe, cool and dry place away from stray magnetic fields which could alter their contents.

## 1.3. System Specifications:

Dimensions: 8.54 X 17.56 X 24.0 inches deep  
(21.59 X 44.45 X 58.96 cm. deep)

Weight: 1 floppy disk and 1 hard disk: approx. 80lbs (36.240 kgs.)  
2 floppy disks: approx. 60 lbs (27.180 kgs.)

### External Power Supply:

A 150 watt switching power supply drives the motherboard. It outputs a total of 14 amps and can be ordered for either:

(U.S.) 110 VAC nominal (90V to 130V min/max) 60 Hz

(Export) 220 VAC nominal (198V to 242V min/max) 50 Hz

AC Power: 2.5 Amps @ 115 VAC (maximum)  
1.25 Amps @ 220 VAC (maximum)

### Internal Power Requirements:

Floppy disk: 24V @ 1.5 amps regulated  
5V @ 1.0 amp regulated  
12V @ .33 amp unregulated

Hard disk: 24V @ 6.0 amps regulated  
5V @ 5.0 amps regulated  
-12V @ 300 Ma unregulated

Type: Linear  
Efficiency: 80% typical  
Total AC Power: 4.5 amps @ 115 VAC (maximum)  
2.25 amps @ 220 VAC (maximum)

**CPU Specifications:**

CPU Type: Z80A (NEC 780A)  
CPU Speed: 4 Mhz (6 Mhz optional)  
Math Processor: AMD 9512 (optional)  
Memory: 65K bytes of 200 ns low power static  
standard (expandable to 1 Mbyte)  
2K bytes of EPROM

Standard I/O: 3 Serial channels (50 baud to 56K baud)  
1 daisy-wheel printer channel

Real-Time Clock: NEC 1990C

Interrupt  
Controller: 8259A

**Environmental Considerations:**

Temperature: 10 C to 40 C (operating)  
-40 C to 52 C (non-operating)

Humidity: 10 to 90%

Elevation: Sea Level to 3658 meters (12,000 ft.)

## 2. UNPACKING THE DECISION I

**IMPORTANT NOTE: SAVE YOUR PACKING MATERIAL!** The Decision I computer has been shipped from the factory in packing materials that help prevent damage to the computer due to rough handling. If you need to return the unit to Morrow Designs, it **MUST** be packaged in its original factory shipping container to qualify for service under warranty. Repacking the computer in its original container provides the best protection during shipment.

- Enclosed in your box is a list of contents of the system you have ordered. This list contains the serial numbers of all devices in your system. Please check the contents of the container to verify all components have been received. Most systems have more than one shipping box but the Decision I box always contains the total system contents document. Please file this away with your records for future reference.
- Remove all the system documentation and the AC power cord from the container.
- Carefully lift Decision I enclosure from shipping container and remove from foam packing material.
- Place the unit on a flat surface and inspect cabinet for any signs of shipping damage.

## 3. SYSTEM INSPECTION

**WARNING:** The Decision I computer system contains hazardous voltages inside. Do NOT connect the AC power cord until all connections are made. Extreme care should be taken when installing cables and components within this system.

The Decision I is shipped from the factory set for normal operation and all internal connections in place. Check to make sure that none of the boards or cables have been jarred loose during shipping. The factory set switch settings are described in the appendix of this manual. (The user is also referred to the technical manuals for each of the components in this system.)

#### 4. CONNECTOR ORIENTATION

Connections to the Decision I are made with ribbon cable connectors. Refer to Figure 3-1 for the placement of these cables. When making these connections, take care not to bend the pins or damage the connectors.

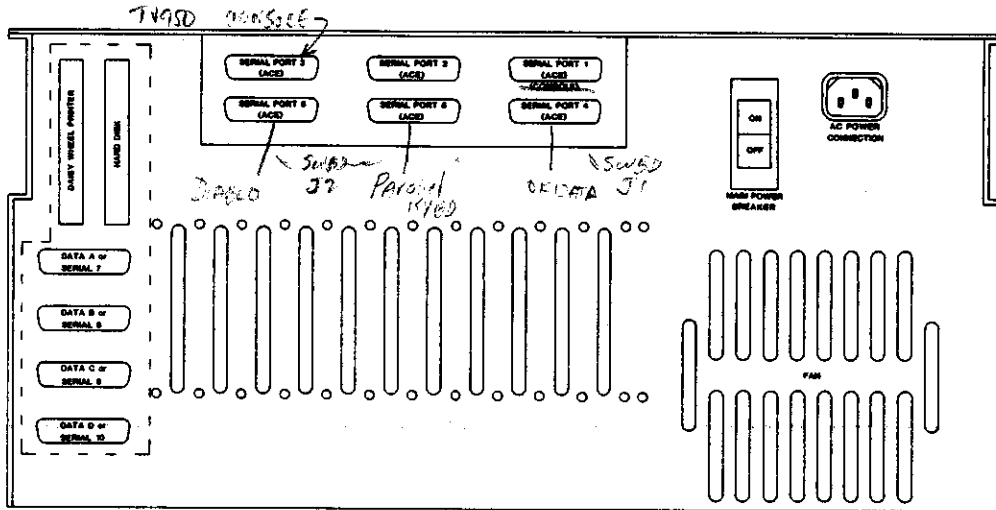


Fig. 3-1: Decision I Rack Mount - Rear Panel

##### 4.1. "D" Style Connectors

These connections are simplified because of their "D" shape. Simply match the connector to the pin connection socket.

The main console device in the Decision I is always connected to the 25-pin "D" style connector labeled ACE SERIAL PORT 1 on the figure. This is for connection of a CRT terminal and is the standard I/O device for Morrow Designs software and the Decision I version of CP/M. (Refer also to the installation instructions for your particular terminal to connect this device and to the technical reference manual for the Mult/IO controller board for information on RS-232 handshake protocol.)

The connectors to the left of this (SERIAL PORTS 2 and 3) are for a second and third CRT terminal in multi-user systems, or for a second terminal and a serial printer.

Another set of ACE serial ports lie below this row; their use requires additional hardware.

There is also a set of four "D" style connectors below two vertical 50-pin connectors at the left side of the rear panel. These have been cleverly designed for both 26-pin serial and 20-pin data connections.



#### 4.2. 50-Pin Connections

On the left side of the rear panel are two vertical connectors, one for a daisy-wheel printer and one for an additional hard disk. These require 50-pin connectors.

Connection for the daisy-wheel printer is correct if the ribbon leads toward the center of the rear panel. Connecting the end of this cable to your printer may take a little bit of "trial and error." Try the connection one way; if it doesn't work, turn it around and try it again.

#### 4.3. Power Connections

The Decision I Rack Mount requires a maximum of 110 volts at 2.5 amps for operation. Systems with a built-in hard and floppy disk require 115 V at 4.5 amps maximum. There is an AC power receptical that mates with the supplied AC power cord on the rear panel. Simply plug the cable into the receptical, then plug the cord into a grounded (three-prong) outlet and the system is ready to be used. (Do not connect the power cables, however, until you are satisfied that all connections are properly made.)

#### 4.4. Circuit Breaker Protection

The main power button on the rear panel provides both power ON, OFF and circuit breaker protection. In the unlikely event of system or peripheral failure, the circuit breaker trips (switches to the middle position) preventing further damage to the components or peripheral devices. This circuit breaker is rated at 5 amps and trips when the AC power draw exceeds this limit. Upon tripping, power will not be supplied until the breaker switch is thrown to the full OFF position, then returned to the ON position. However, any time the breaker does trip, first investigate the conditions which caused the overload and remove them before re-applying power.

In addition to the rear panel switch, there is also a front panel power switch which has been wired in series with the back panel breaker switch. Both switches must be ON for the computer to receive power. Leave the rear panel switch in the ON position and use the front panel switch to turn power on and off to system.

## **5. SYSTEM MAINTENANCE**

The Decision I requires no special maintenance under normal operation. The cabinet is constructed of a highly durable metal impervious to stains and dirt. If required, the cabinet may be cleaned with a mild detergent and water and a non-abrasive cloth. Internal components need no special maintenance.

Failure of any Decision I system component during the warranty period not due to abuse or neglect is covered under the standard Morrow Designs warranty and the customer is referred to his supplier for service. (See also Morrow Designs' warranty and return policy.)

## 6. INITIALIZING THE FLOPPY DISK

It is suggested that you try initializing your system before installing it into the desk.

After plugging in connections for your printer and terminal(s), check that all connections are correct and secure, then plug in the power cord.

Turn on power to your system by pressing the right portion of the red POWER button on the front of the unit down. The red RESET button lights. Press this button once to insure proper system initialization. At this point the red indicator light for the floppy disk unit is on and blinking. If the light is lit but not blinking, and pressing RESET does not change this, most likely an improper cable connection has been made.

Troubleshooting this problem may again take some "trial and error." Begin by shutting off the power to the system, then methodically changing the internal cable connections. The user is also referred to the troubleshooting chart at the end of this manual.

Once your system has been properly powered up, which is indicated by the blinking red light on the front of floppy disk drive, you are ready to initialize the floppy disk.

Insert the system diskette into the drive, label facing up and away from the door. Close the door. You will hear some activity within the drive, then the following message appears on your terminal CRT:

```
Morrow Designs nnK CP/M 2.2., Cbios, Rev. 2.nn
```

The number (n) is determined by your system configuration. There will also be information describing your disk drive, console and printer. Immediately after this message, the CP/M prompt appears

```
A>
```

indicating you have successfully "booted" your system.

If you have a Morrow Designs 10 or 20 megabyte hard disk unit, read the following section for the procedures to initialize your hard disk.

## 7. TESTING THE HARD DISK

This section explains the procedure for testing your hard disk. It is assumed at this point that your floppy disk unit is properly installed.

Even though your hard disk was tested at the factory before being sent to you, it must undergo another diagnostic test to be sure that no head alignment problems occurred during shipping. This test takes six to 10 hours, depending upon the size of your disk. In order for the test to begin successfully, the first two tracks (0 and 1) of the hard disk must be error free. Consequently, if an error exists in either of these tracks, the unit will not function. (If you suspect that this is a problem in your unit, contact the Customer Service Center.)

The first test run is the FORMATHD program. It is included on your system floppy diskette and is called by entering

```
A> formatd
```

at the terminal. (Note that the system is in the CP/M mode; please also allow time for your hard disk to "get up to speed" before beginning this test.) Correct entry results in the following display on your display screen:

```
Discus M10, M20 and M26 hard disk format program, Rev. 2.1.  
Choose the desired function:
```

- L = format a Logical drive.
- F = Format an entire physical drive.
- C = Continue an interrupted test.
- D = run a Diagnostic test.

```
Function (RETURN to exit):
```

To begin the diagnostic test, enter D, then press RETURN. This program now prompts:

```
How much of a diagnostic do you want to run:
```

- 1 = Sector header field test only.
- 2 = Sector data field test only.
- 4 = Seek mechanism test only.

Choose the diagnostic by adding together the desired options.

```
Options (RETURN to exit):
```

Option sum is 7 - all diagnostics are run. Enter 7, then press RETURN. The next prompt asks for the following information:

Enter physical drive number to be tested or formatted (1-4, RETURN to exit):

In this configuration, one drive is tested. Enter 1, then press RETURN. Now,

Select the drive type:

- A = Discus M26, 26 megabyte drive.
- B = Discus M10, 10 megabyte drive.
- C = Discus M20, 20 megabyte drive.

Drive type (RETURN to exit):

Enter B or C, depending upon your hard disk unit, then press RETURN.

The first areas tested are the sector headers. This is evidenced by the following display:

```
Testing sector headers.....  
.....
```

The test has begun. For the next six to 10 hours information of this sort is displayed on the video display screen. As each test is completed, new descriptions are displayed such as "Seek test" or "Testing sector data." Error information is also displayed, if errors are found. Their displays resemble the following example:

```
SECTOR ERR, TRACK 233, HEAD 0, SECTOR 2, COUNT 189
```

Error information is recorded by the system. Bad sectors, including sectors that are diagnosed as marginal by the test, are "mapped" (effectively blocked) out of the system.

When the test is finished, the results are placed in a special file created by three routines used within a program designed to map out bad sectors. This procedure is explained in Appendix E.

## 8. INITIALIZING THE HARD DISK

At this point your system diagnostic tests should be complete. If so, the next step is to "boot up," or initialize, the hard disk.

It is best to describe this procedure from a "cold boot." If your system is on, shut it off, then follow these steps:

- A. Turn on power to the Decision I.
- B. Check that the red RESET button on the Decision I front panel is lit. Press this button in ONCE to insure proper system initialization.
- C. Check that the red indicator light under the floppy disk unit is blinking.
- D. Insert the system floppy diskette - label side up and away from the slot, and close the door.

At this point you will hear some activity within the floppy disk system, then the following message appears on the display screen:

Morrow Designs nnK CP/M 2.2., Cbios, Rev. 2.nn

The full revision number depends on your system configuration. Information describing your disk drive(s), console and printer configuration is also displayed. Immediately after this, the CP/M prompt appears:

A>

indicating that you have successfully "booted" your floppy disk unit. Now it is time to initialize the hard disk. Once again call the FORMATHD program:

A>formathd

And once again you will see the following display on your terminal screen:

Discus M10, M20 and M26 hard disk format program, Rev. 2.1.  
Choose the desired function:

- L = format a Logical drive.
- F = Format an entire physical drive.
- C = Continue an interrupted test.
- D = run a diagnostic test.

Function (RETURN to exit):

This time enter F to format the physical drive. Press RETURN. The next prompt is

Enter physical number to be tested or formatted (1-4, RETURN to exit):

Enter 1 and press RETURN. Next the program asks

Select the drive type:

- A = Discus M26, 26 megabyte drive.
- B = Discus M10, 10 megabyte drive.
- C = Discus M20, 20 megabyte drive.

Drive type (RETURN to exit):

Enter B or C, depending upon your hard disk unit, then press RETURN. If you have an M10, the system will prompt:

Select drive type:

- F = Fujitsu
- M = Memorex

Type (RETURN to exit):

Enter F, then press RETURN. For all Discus users, the system now prompts:

Enter amount of formatting desired:

- H = Format Headers only (data remains intact)
- D = Erase Data field also

Function:

Enter D and press return. The system now tells you that

```
Formatting the entire physical disk will take about four
minutes.....
.....
.....
.....
```

At the end of that time, it says

```
All finished, returning to CP/M
Press RETURN to return to CP/M:
```

Press RETURN, and the CP/M prompt reappears.

### 8.1. Bad Sector Check

To check out the hard disk system, enter the GETBAD command:

```
A> getbad
```

This program displays any errors - such as TRACK, HEAD and SECTOR - along the left side of the screen. When the CP/M prompt appears again, you may also use the FIXBAD program to create a bad sector map (refer also to Appendix E). Enter the FIXBAD program

in the following format:

```
A> fixbad e f g*
```

\*Enter g only if you have an M20. FIXBAD reads a "bad spot" map, if one has been created by the FORMATHD program, and allocates it to an "invisible" file, thus protecting CP/M from access to these spots. Once this program is finished, you are ready to install your system on the hard disk.

## 8.2. Installing the System

First enter the MOVCPM command using the following parameters:

```
A> movcpm 28nn *
```

The number (nn) is determined by the size of your system; this should be noted on your system diskette. You may also enter:

```
A> movepm *
```

to install the largest system your computer is capable of. Next install the operating system. Call

```
A> sysgen
```

This program returns with the following prompts:

```
SYSGEN VER. 2.2  
SOURCE DRIVE NAME (OR RETURN TO SKIP)
```

Press RETURN. Next it prompts:

```
DESTINATION DRIVE NAME (OR RETURN TO REBOOT)
```

This time enter E and press RETURN; it now prompts

```
DESTINATION ON E, THEN TYPE RETURN.
```

Follow these instructions. Once the CP/M prompt reappears, you are ready to move the system files onto your hard disk. Here you will use the CP/M PIP command:

```
A> PIP E:=*.*[v]
```

Press RETURN. You should hear some activity and see the light go on under the floppy disk slot. PIP will also write the files it is transferring for you on your screen. Once this procedure is complete, you will be ready to boot your hard disk. Enter:

```
A> boothd
```

press RETURN, and the following message appears.



Morrow Designs nnK CP/M 2.2., Cbios rev 2.nn  
(system configuration)  
Decision I configured as console.

Use the CP/M directory command now to check that your drives are properly formatted. This command should have the following results (see Appendix A for list of system files):

```
A> dir
list of system files on hard disk

A> dir b:
no files

A> dir c:
list of system files from floppy disk unit (M10 only)

A> dir d:
list of system files from floppy disk unit (M20)

A> dir e:
no files (M20 only)
```

### 8.3. Cold Boot

Follow steps A - D outlined at the beginning of this section. Once the initial header and CP/M prompt (A>) have appeared, simply enter `boothd` after the prompt, press RETURN, then watch for the second header and the CP/M prompt again. You should be up and running!

### 8.4. Warm Boot

If your system is already on and it is necessary to reboot, (usually done when copying diskettes in the CP/M program) simply enter a control C (^C) sequence.

Occasionally, the CP/M prompt changes to a `:` (this may happen upon reset and sometimes when the system is first initialized). If this prompt appears, enter a single `b` after the prompt; do not press RETURN. The system should automatically change the prompt back to `A>`.

### 8.5. Booting From the Hard Disk

In systems that have been set up to boot from the hard disk, all that you need do is turn on the power and press the RESET button. This is done by setting switches on the MPZ80 CPU board. These settings are described in Appendix D of this manual. The settings and procedure are also described on page 15 of the MPZ80 CPU Technical Manual.

## 9. TROUBLESHOOTING CHART

The following table has been designed to aid you in the event the Decision I does not operate correctly.

PROBLEM	PROBABLE CAUSE	REMEDY
<b>FLOPPY DISK</b>		
<b>FAN OFF, POWER INDICATOR NOT LIT:</b>	Power cord not plugged in.	Plug in cord.
	Power cord not plugged into rear panel of system.	Plug in cord.
	Wall outlet not live.	Check outlet. Check circuit breaker.
	Main circuit breaker has tripped.	Check system for shorts; turn breaker OFF, then back ON.
<b>FAN ON, POWER INDICATOR NOT LIT</b>	Indicator light bad.	Replace indicator light.
	Internal connection loose.	Contact service center.
	Power supply connection loose.	Contact service center.
<b>DISK DRIVE INDICATOR LIGHT DOES NOT BLINK</b>	Internal cable not connected correctly.	Reconnect it.
	System was not reset.	Press RESET.

<b>PROBLEM</b>	<b>PROBABLE CAUSE</b>	<b>REMEDY</b>
<b>DRIVE HEAD LOADS, SEEKS, BUT SYSTEM DOES NOT POWER UP:</b>	Floppy diskette inserted incorrectly.	Insert diskette with label facing up and away from slot.
	Incorrect diskette inserted.	Insert diskette with Morrow Designs label- refer to Sections 1.2 & 6.
	Cables and plugs incorrectly connected.	Refer to Sections 3 and 4.
<b>SYSTEM LOADS WITH GARBLED MESSAGE:</b>	Baud rate or word setting incorrect.	Refer to Appendix C.
<b>HARD DISK</b>		
<b>DRIVE DOES NOT INITIALIZE</b>	Internal cables connected incorrectly.	Methodically change cable connections.
	Power supply connection loose.	Contact service center.
	Drive head not unlocked.	Unlock head.

## APPENDIX A

### CP/M Software

Over 30 software programs are included on the system diskette. These may be displayed with the CP/M DIR command:

MOVCPM	COM : ABOOT&	ASM : ASM	COM : BAD	DOC
BAUD	COM : BAUD	DOC : BIOS	ASM : BOOTH	ASM
BOOTH	COM : CBIOS&	ASM : CBIOS	ASM : DDT	COM
DEBLOCK	ASM : DISKDEF	LIB : DUMP	ASM : DUMP	COM
ED	COM : FIXBAD	COM : FORMATH	ASM : FORMATH	COM
FORMAT#	ASM : FORMAT#	COM : GETBAD	COM : HDFIRM	ASM
HTYP	ASM : HTYP	PRL : LOAD	COM : INSTALL	COM
INSTALL	DOC : MAKEPRL	COM : MAKEPRL	DOC : MBASIC	COM
NOTESHD	DOC : PIP	COM : PRL	DOC : PUTBAD	COM
REGEN	ASM : REGEN	COM : SINGLE	ASM : SINGLE	COM
STAT	COM : SUBMIT	COM : SYSGEN	COM : XSUB	COM

**Fig. A-1: System Directory (Hard and Floppy Disk System)**

MOVCPM	COM : ABOOT&	ASM : ASM	COM : BAUD	COM
BAUD	DOC : BIOS	ASM : CBIOS&	ASM : CBIOS	ASM
DDT	COM : DEBLOCK	ASM : DISKDEF	LIB : DUMP	ASM
DUMP	COM : ED	COM : FIRMB	ASM : FORMAT#	ASM
FORMAT#	COM : HTYP	ASM : HTYP	PRL : LOAD	COM
INSTALL	COM : INSTALL	DOC : MAKEPRL	COM : MAKEPRL	DOC
MBASIC	COM : NOTESHD	DOC : PIP	COM : PRL	DOC
REGEN	ASM : REGEN	COM : SINGLE	ASM : SINGLE	COM
STAT	COM : SUBMIT	COM : SYSGEN	COM : XSUB	COM

**Fig. A-2: System Directory (Floppy Disk System Only)**

## APPENDIX B

### Program Descriptions

ABOOT&.ASM	Source code for cold boot section of CP/M configured for Morrow Design hardware.
ASM.COM	CP/M command; assembles 8080 assembler source.
*BAD.DOC	Describes the routines used to read and write bad sector maps from the hard disk and place them in special file.
BAUD.COM	Commands to change the baud rate on the Decision I Wunderbuss or Mult/IO boards.
*BAUD.DOC	Instructions for BAUD.COM
BIOS.ASM	Skeletal BIOS (basic I/O system) supplied by Digital Research.
BOOTH.D.COM	Command to boot Discus hard disk.
BOOTH.D.ASM	Source code for BOOTH.D.COM
CBIOS.ASM	Digital Research supplied CBIOS configured for Intel MDS-800.
CBIOS&.ASM	Source for CBIOS configured for Morrow Designs hardware.
DDT.COM	CP/M command; Dynamic Debugging Tool which allows interactive testing of programs generated in CP/M environment.
DEBLOCK.ASM	CP/M command; source for sector deblocking subroutines.
DISKDEF.ASM	CP/M source for macro expansions of disk definitions.
DUMP.COM	CP/M command; types contents of disk files at the console in hexadecimal form.
DUMP.ASM	Source code for DUMP.COM
ED.COM	CP/M command; calls context editor to create and alter source files.
FIXBAD	Allocates the bad sector map to a special file (USER 15).
FORMATHD.COM	Commands to format and test Discus hard disk systems.

FORMATHD.ASM Source code for FORMATHD.ASM  
 FORMT#.COM Command to format diskettes on DJ2D/B.  
 GETBAD Reads the bad sector map from the hard disk.  
 INSTALL.COM Command to temporarily add devices onto CP/M system. Uses:  
     HTYP - Diablo printer driver simulator.  
 \*INSTALL.DOC Documentation for INSTALL.COM.  
 LOAD.COM CP/M command; converts Intel hexadecimal format files to command format files.  
 MBASIC.COM Microsoft's BASIC-80, Rev 5.2.  
 MOVCPM.COM CP/M command; changes CP/M system size.  
 \*NOTESHD.DOC Descriptions and examples of commonly used files in the hard disk system.  
 PIP.COM CP/M command; Peripheral Interchange Program used to transfer files between selected I/O devices.  
 PUTBAD Allows user to make a custom bad sector map.  
 REGEN.COM Converts non-1791 format diskettes to that format.  
 SINGLE.COM Turns single drive system into "logical" dual drive system for copying diskettes.  
 SINGLE.ASM Source code for SINGLE.COM.  
 STAT.COM CP/M command; provides statistical information about files and disks.  
 SUBMIT.COM CP/M command; runs commands in batch mode.  
 SYSGEN.COM CP/M command; reads or writes reserved CP/M system tracks.  
 XSUB.COM CP/M command; allows submitted commands to receive input from submit file.

CP/M commands are described in more detail in the CP/M 2.2 Manual. Program descriptions of many of these files also exist on the system diskette.

\*These files may be printed out in either the CP/M or Wordstar program.

## APPENDIX C

### Alternate Baud Rate Selection

The Decision I is shipped from the factory with the terminal baud rate set at 9600. The serial channels are set for 1 start bit, 2 stop bits, 7 data bits, no parity.

The following baud rates are also available, if your system requirements demand this.

**19200, 9600, 4800, 2400, 1200, 300 and 110**

Software selection of alternate baud rates is provided with the BAUD.DOC program included on the CP/M diskette. This program describes the commands and procedures for baud rate selection.

## APPENDIX D

### Factory Switch Settings

The factory configuration for the Decision I Rack Mount computer includes a

Mult/IO Controller Board  
Decision I (MPZ80) CPU  
MM65K Memory Board  
Disk Jockey Model 2D/B Floppy Disk Controller  
(HDCA-3 Winchester Hard Disk Controller Board)

For a full description of these products, the user is referred to the technical manuals.

Table D-1: Mult/IO Controller Board:

<u>Switch 2D</u>			<u>Switch 7B</u>			<u>Switch 10B</u>		
OFF	ON		OFF	ON		OFF	ON	
	==	1		==	1	==		1
	==	2		==	2	==		2
	==	3	==		3	==		3
	==	4		==	4	==		4
==		5		==	5		==	5
==		6	==		6		==	6
==		7		==	7	==		7
==		8		==	8	==		8

Board revision 3 or 4; settings enable extended addressing. RAM address = 0FC000h.

#### Jumpered Settings:

J4 - B to C  
J5 - jumpered B to PINT  
J6 - installed (rev. 4 only)



Table D-2: Decision I (MPZ80) CPU:

<u>Switch 16D</u>				
Floppy Disk			Hard Disk*	
OFF	ON		OFF	ON
==		1		1
==		2		2
==		3		3
==		4		4
==		5		5
==		6	==	6
==		7		7
	==	8		8

\*Optional: These settings allow system to be booted from the hard disk once it is initialized; procedure explained on page 15 of the Decision CPU Technical Manual.

Table D-3: MM65KS Memory Board:

<u>Switch 1C</u>			
OFF	ON		
	==	1	
	==	2	
	==	3	
	==	4	
	==	5	
	==	6	
	==	7	
	==	8	

<u>Switch 5D</u>			
OFF	ON		
==		1	
==		2	
	==	3	
==		4	
==		5	
	==	6	
	==	7	
	==	8	

Switches set to enable extended addressing. Chip 2D not installed; chip 1D installed.

Jumpered Settings:

- J1 - installed
- J2 - installed
- J3 - not installed
- J4 - installed
- J5 - not installed
- J6 - installed
- J7 - not installed

Table D-4: Disk Jockey 2D/B Floppy Disk Controller:

<u>Switch 5D</u>			<u>Switch 13C</u>		
OFF	ON		OFF	ON	
==		8	==		8
	==	7	==		7
==		6	==		6
==		5	==		5
==		4	==		4
==		3	==		3
==		2	==		2
==		1	==		1

Note that in some systems these switches were installed such that the top paddles are labeled "1" and the last paddles "8." In the event that your DJ2D/B has been constructed this way, all paddles are OFF except paddle 2 on Switch 5D, which is ON.

Jumpered Settings:

- J2 - installed
- J4 - jumpered A to B

**Table D-5: HDCA-3 Winchester Hard Disk Controller:  
(Users with hard disks only)**

Switch 8C

OFF	ON	
	==	1
==		2
	==	3
==		4
	==	5
	==	6
	==	7
	==	8

Jumpered Settings:

A to VI0  
B to VII

Seek Complete Plugs:

P3 - jumpered 7 to 8  
P4 - jumpered 7 to 8  
P5 - jumpered 7 to 8

APPENDIX E

## Sector Check

Ideally, no bad sectors were found in your hard disk during the diagnostic test. But if there were, these sectors are mapped out of the system and placed in a special CP/M file.

The diagnostic programs included on your system floppy diskette contain a BAD.DOC program. The routine, GETBAD, described within this document, reads the bad sector map that was setup by the FORMATHD program, then prints the information on the terminal. Another routine, FIXBAD, allocates the bad sector map to a special file. (There is also another routine called PUTBAD which allows the user to custom write his own bad sector map.)

The special file is referred to as USER 15 and makes a BADSPOT file, which is not normally displayed and will not appear in the file list when the CP/M directory (DIR) command is entered. It is only displayed when entered with the CP/M device status (STAT) command.

The following procedure will verify whether any bad sectors exist on your hard disk. Enter the following:

1 A> PIP

When this character appears,

2 \*

enter a ^C sequence; the "A>" prompt returns in the PIP mode. Next enter

3 A> USER 15  
4 A> SAVE 34 PIP.COM  
A> PIP A:=A:STAT.COM[GØ]  
A> STAT \*.\*

If bad sector areas do exist, the system returns a report of this in the following format:

Recs	Bytes	Ext	Acc
128	4k	1	R/O A:(BADSPOTS)*
68	12k	1	R/W A:PIP.COM
41	8k	1	R/W A:STAT.COM

Bytes remaining on A: nnK

\*If this report is missing, or if there is any question about the integrity of your hard disk unit, run it through the diagnostic tests again. If you still result in problems, contact the Customer Service Center at Morrow Designs.

