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MORE DATA PER DOLLAR

Dear user,

As you are among the first users to receive the new DOSPLUS 3.5 operating system, there are two points of which you should be aware.

1. The Hard Disk III User's Manual included in this package was written for the older DOSPLUS 4.0. Any references to the DOSPLUS manual will be inaccurate.

2. The Model I DOSPLUS 3.5 operating system is distributed on two 35 track single density diskettes. 40 track, 80 track, double density and double sided versions may be created from these two diskettes.

VR Data Technical Support

ABOUT YOUR VR DATA HARD DISK III

VR Data's Hard Disk III 5 1/4" Winchester drive subsystem is a very versatile tool when combined with your TRS-80 micro-computer.* By adding a Hard Disk III to your computer, you can eliminate the time consuming and tedious task of swapping diskettes in and out of the floppy drives,and access information much faster.

The Hard Disk III comes in an attractive package that can hold either one or two 5 1/4" Winchester drives, with a storage capacity of up to 30 million characters. The VR Data Hard Disk III is compatible with both the TRS-80 Model I and the Model III.* The installation of the Hard Disk III is quite simple. The Hard Disk III will plug directly into the I/O bus of the TRS-80 Model III with a ribbon cable. An I/O bus adapter is required for installation on the Model I. Installation insructions will be covered in another section of the manual.

The VR Data Hard Disk III comes fully tested from the factory with a 120 day extended warranty. The Hard Disk III is easily installed, and any problems you may have with your Hard Disk III unit will be quickly solved by our technical staff at VR Data or by your local dealer.

VR Data uses modular construction in the Hard Disk III for ease of repair and expansion by our factory technicians. The Hard Disk III uses industry standard media with proven performance and reliability. It has a built-in power line filter to lessen the unit's susceptiblity to power line noise. In the case of power line interruption or accidental turn-off, the hard disk will finish the disk operation it is currently performing.

* TRS-80, Model I, and Model III are registered trademarks of the Tandy Corp.

UNPACKING AND INSTALLATION INSTRUCTIONS:

UNPACKING:

Carefully unpack the Hard Disk III from the shipping container using a sharp knife or scissors. Be careful not to push the knife or scissors too far into the shipping container, it may damage your hard disk's cover. Record the Hard Disk III information from the blue and silver label on the back of the drive. This information will be used when you configure and format your drive. If you place your Hard Disk III adjacent to the screen, you may see distortion caused by the Hard Disk III's fan.

Save your packing material, you may need it for sending your Hard Disk III to the factory in the event that it needs repair.

INSTALLATION:

1. Connect the cables to your drive.

    a. Using a small screw driver or a ball point pen, carefully set the sector size switch located on the underside of the host adapter board to the 256 bytes per sector position. (see Figure 2.)

    b. The 50 pin flat cable is connected to the 50 pin edge connector on the back of the drive chassis so that the cable exits toward the bottom of the drive.

    c. The other end of the 50 pin edge connector is connected to the 50 pin paddle on the bottom, so that the cable exits the rear of the Model III. (see Figure 3.)

    d. The power cable (3 wire) is connected to the EMI filter socket assembly on the back of the Hard Disk III before connecting it to the wall socket.

e. If you purchased a bootstrap ROM with your Hard Disk III, you may want to install it before using your hard disk. For instructions on how to do this see the section of this manual entitled Bootstrap ROM Installation.

f. Be sure not to block the ventilation holes of the hard disk enclosure, because this could cause the hard disk to malfunction.

2. Power up the system.

a. The Hard Disk III has no power switch. Instead it has a power sensing circuit combined with a solid state relay.

b. When the Model III is powered up, the Hard Disk III should also power up.

c. Due to the mass of the recording platters, the Hard Disk III will take approximately 30 seconds to come up to speed and be ready for access.

d. When powering down the system, all peripherals should be powered down before or simultaneously with the microcomputer. Having peripherals powered on with the Hard Disk III on line may keep the Hard Disk III powered on because of the power sensing circuit.

e. Do not move the Hard Disk III while it is running. Moving the Hard Disk III while running may cause a head crash.

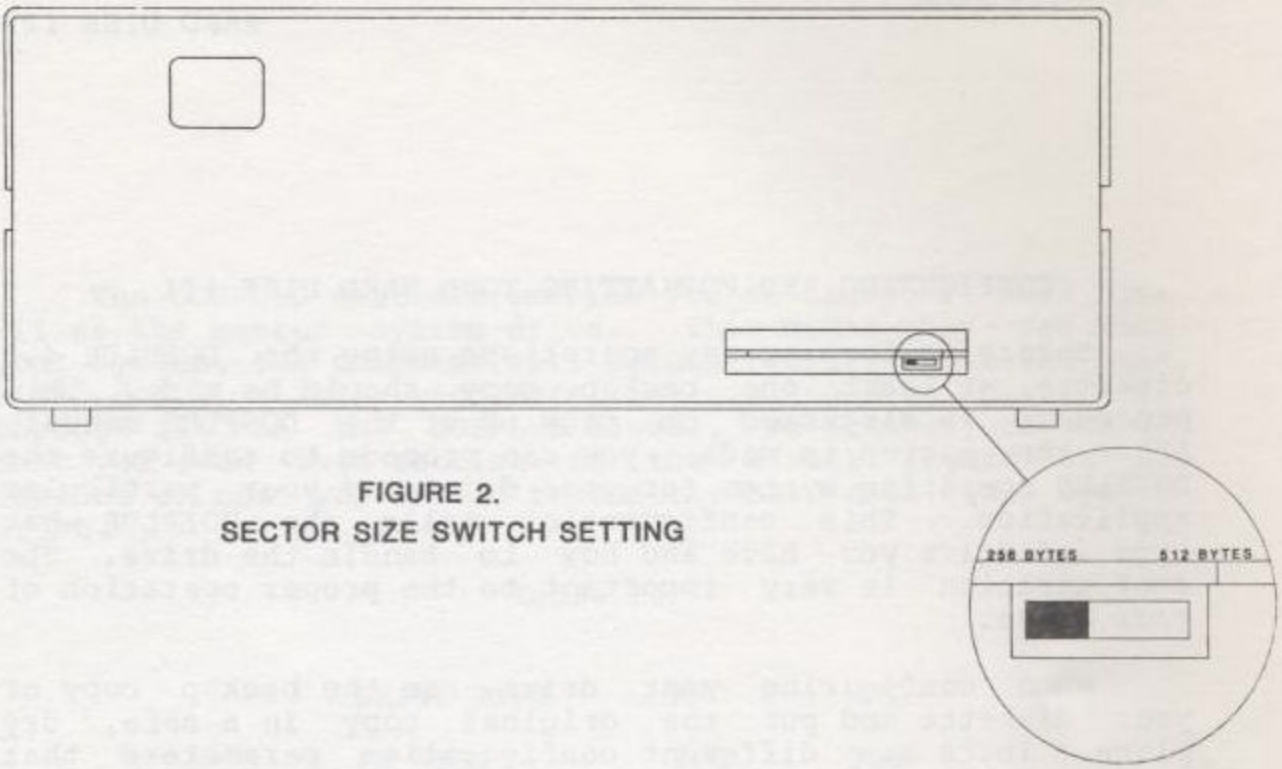


FIGURE 2.
SECTOR SIZE SWITCH SETTING

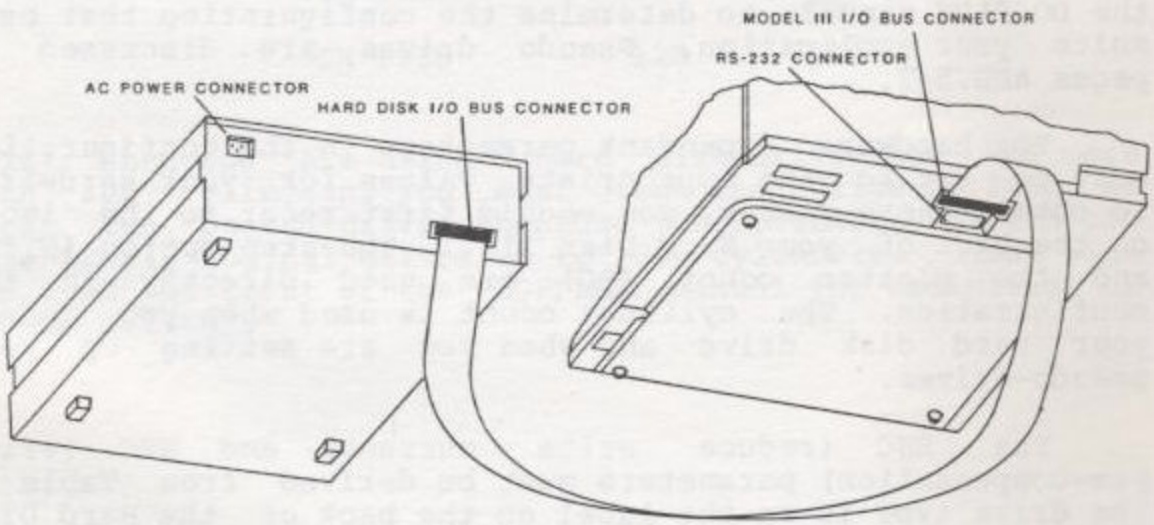


FIGURE 3.
MODEL III CABLE HOOK-UP

CONFIGURING AND FORMATTING YOUR HARD DISK III

Before performing any operations using the DOSPLUS 4.0 diskette, at least one backup copy should be made. This procedure is discussed on page 2 of the DOSPLUS manual. After the backup is made, you can procede to configure the DOSPLUS operating system for your drive and your particular application. This configuration tells the DOSPLUS what type of drive you have and how to handle the drive. The configuration is very important to the proper operation of your drive.

When configuring your drive, use the backup copy of your diskette and put the original copy in a safe, dry place. There are different configuration parameters that must be set before you use your hard disk drive. Some of these parameters are user definable, (ie. GS, DS, BA, PD). Other parameters are a function of the hardware, (ie. STEP, PC, TS, RWC, WPC).

Explanation of the configuration function is in the DOSPLUS manual pages 32 through 38. For the user definable parameters we recommend that you review pages 14 and 15 in the DOSPLUS manual to determine the configuration that best suits your application. Pseudo drives are discussed on pages ADD.5-7.

The hardware dependant parameters in the configuration must be set to the appropriate values for your hardware. To obtain these values, you should first refer to the label on the back of your Hard Disk III. The step option (STEP) and the platter count (PC) are used directly in the configuration. The cylinder count is used when you format your hard disk drive and when you are setting up your pseudo-drives.

The RWC (reduce write current) and WPC (write pre-compensation) parameters must be derived from Table 1. The drive type is on the label on the back of the Hard Disk III. Use the RWC and WPC parameters that match the type of drive you have.

The DOSPLUS software enables you to use your Hard Disk III as the master system drive. This means when you boot your system, the computer will automatically go to the hard disk drive. This procedure is outlined on pages 112 through 115 in the DOSPLUS manual. We strongly recommend that you read this section of the manual regardless of whether or not you intend to use the hard disk as a system drive.

Table 1.

DRIVE TYPE	RWC	WPC
CM 5619	306	306
TM 602S	128	153
TM 603S	128	153
TM 501S	128	306
TM 502S	128	306
TM 503S	128	306

NOTE: When you are using a hard disk drive that has more than 200 cylinders, you must break the drive up into at least two pseudo-drives because the operating system can only handle logical drives up to 200 cylinders. (see page Add/5 at the front of the DOSPLUS manual for definition of pseudo drives).

After you have properly configured your hard disk drive, it is ready to be formatted. The formatting procedure is outlined starting on page 101 of the DOSPLUS manual.

After the drive is successfully formatted, it is ready to be used as a data drive. You must keep the system disk in drive 0 in order to do system operations. If you wish to use the hard disk as a system drive refer, to page 112 of the DOSPLUS manual for instructions on how to transfer system files to the hard disk. Even if you are using the hard disk for a system drive, you must boot the system from the floppy drive using a DOSPLUS system diskette unless you have a Hard Disk Bootstrap ROM.

SAMPLE CONFIGURATION

The following is an example configuration of a VR Data Hard Disk III.

The drive we will be using is a 5 Megabyte Hard Disk III. The information on the serial label is as follows:

```
DRIVE TYPE:     TM501
STEP OPTION:        4
# OF CYLINDERS:  306
# OF PLATTERS:     1
```

Looking at Table 1, you will notice that a TM501 will have values of RWC=128 and WPC=306. Since the TM501 has 306 cylinders, it will have to be configured as at least two pseudo-drives.

In our imaginary system, we will assign our pseudo-drives as follows:

106 cylinders for Drive 4, which will be used to store our programs.

200 cylinders for Drive 5, which will be used to store our data files.

Using one of our back-up copies of DOSPLUS 4.0, we boot up our TRS-80. It will come up with the prompt "DOS PLUS".

First we must change the configuration to suit our drive and our application. We type in the following command lines:

```
CONFIG :4(DRIVES=6,STEP=4,PC=1,TS=32,GS=32,DS=32,PD=0,
BA=0,RWC=128,WPC=306,SAVE) ENTER

CONFIG :5(STEP=4,PC=1,TS=32,GS=32,DS=32,PD=0,BA=106,
RWC=128,WPC=306,SAVE) ENTER
```

Since Drive 4 is contained on cylinders 0 through 105, Drive 5 will start at cylinder 106 (BA=106) and end at cylinder 305.

Now we will HFORMAT the drive.
Type in "HFORMAT",ENTER

The program will ask us:

Which drive is to be used?	We answer: 4 ENTER
Diskette name?	We answer: DOSPLUS ENTER
Format date?	We answer: 11/01/82 ENTER
Master password?	We answer: ENTER (no password)
Number of cylinders?	We answer: 106 ENTER
Sector interleave factor?	We answer: 8 ENTER

The computer then displays: FORMATTING DRIVE.
After the drive has been formatted, each granule will be verified. The system information will then be written.

Next we will format Drive 5. The information we use for Drive 5 will be the same as for Drive 4 except the drive to be used will be "5", and the number of cylinders will be "200".

We are going to use the hard disk as a system drive, so we will have to SYSGEN Drive 4. We do this by typing the following command line:

```
SYSGEN :4  ENTER
```

This will transfer all system files to the hard disk.

Next we need to transfer all of the invisible files. This is done by typing in the command line:

```
TRANSFER :0 :4 (I)  ENTER
```

We now want to change the configuration so that the only time we need to have the system diskette in Drive 0 is when we reset the system or do a RESTART 0.

We type in the command line:

CONFIG (SYSTEM=4) ENTER

Then type: CONFIG (SAVE) ENTER

Then reboot the system by pressing the orange button in the upper right hand corner of the keyboard.

Then type: CONFIG (MASTER=4) ENTER

Then type: CONFIG (SAVE) ENTER

The drive is now ready to use.

INSTRUCTIONS FOR MODEL I and LNW 80 USERS ONLY

Included with the Model I version of the VR Data Hard Disk III, is a Model I I/O Bus Interface Adapter.

Some features of the I/O Bus Adapter are:

1. Allows connection of perpherals compatible with Model III I/O Bus.
2. Screen Printer extension port.
3. Gold plated edge connectors.
4. Self-contained fused power supply.
5. Heavy-duty aluminum case.

INSTALLATION:

1. Place the I/O Bus Adapter on the left side of the Model I Expansion Interface, with the power button facing forward. Place the Hard Disk III in a convenient place within reach of the cables.(see Figure 5.)
2. The I/O Bus Adapter is attached to the Model I Expansion Interface with the 40 pin flat cable. One end of the 40 pin flat cable plugs into the connector on the right side of the I/O Bus Adapter with the cable exiting the bottom. The other end plugs into the Screen Printer Port on the Model I Expansion Interface which is the 40 pin connector on the left front side of the Expansion Interface.
3. The 50 pin flat cable is connected to the 50 pin edge connector on the back of the drive chassis so that the cable exits toward the bottom of the drive. The other end of the 50 pin flat cable is plugged into the the back of the I/O Bus Adapter with the cable exiting toward the bottom.
4. The power cable (3 wire) is connected to the AC power connector on the back of the Hard Disk III, before

plugging it into the wall socket. The power cable for the I/O Bus Adapter is also plugged into a wall socket.

5. The system is now ready to power up. The Hard Disk III will turn on when you turn on the I/O Bus Adapter, because of the power sensing circuitry.

6. The Hard Disk III for the Model I works the same as the Model III version. However, there is no Bootstrap ROM available for the Model I Hard Disk III.

LNW USERS ONLY

The Hard Disk III Model I version is also compatible with the LNW 80. The installation is just slightly different.

The 40 pin flat cable is attached to the connector marked "EXPANSION BUS" on the rear of the LNW 80. This cable is attached so that it exits toward the bottom of the computer. (see Figure 6.)

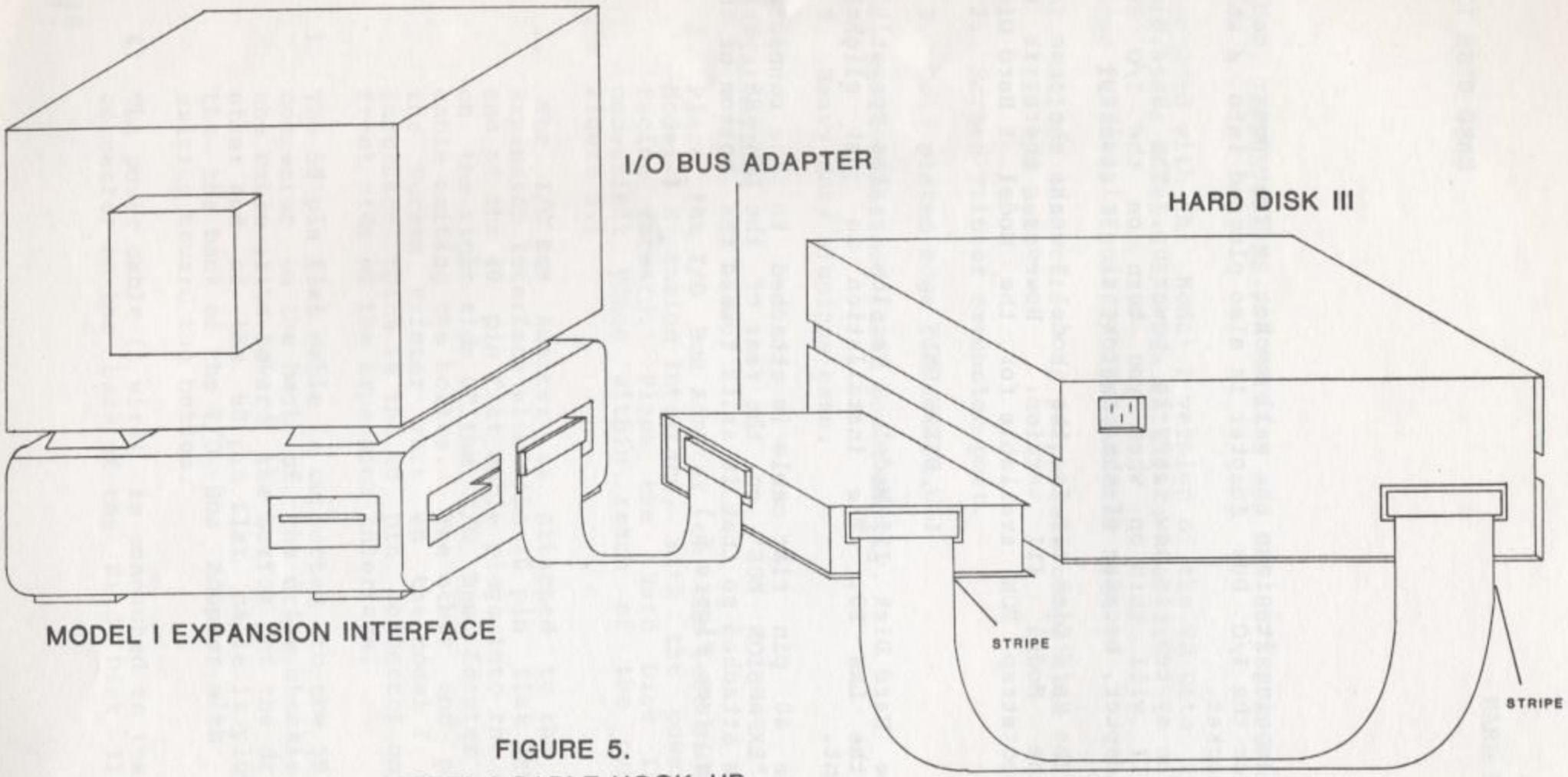
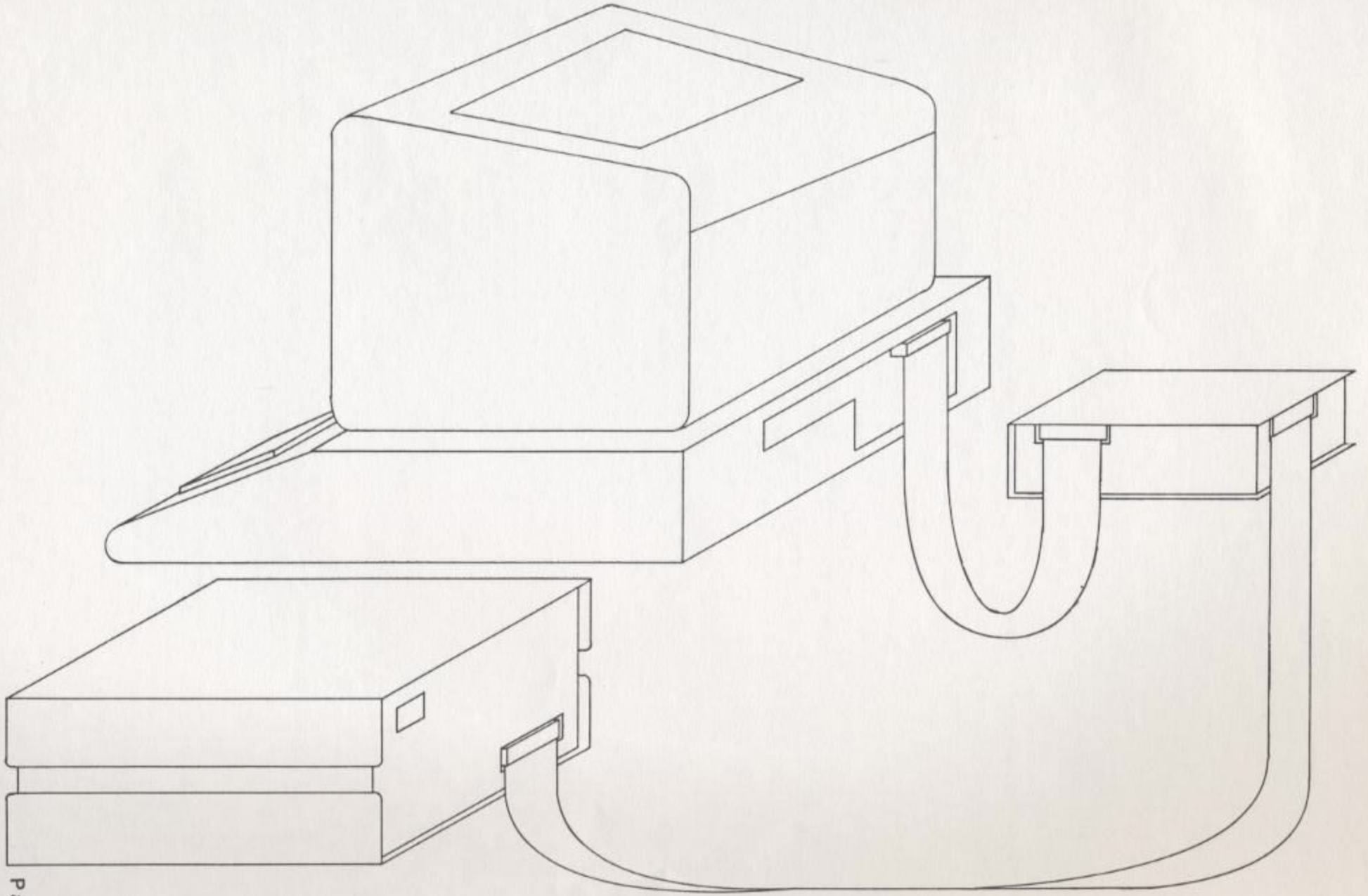


FIGURE 5.
MODEL I CABLE HOOK-UP



LNW-80 TO HARD DISK III
CABLE CONNECTIONS
FIGURE 6.