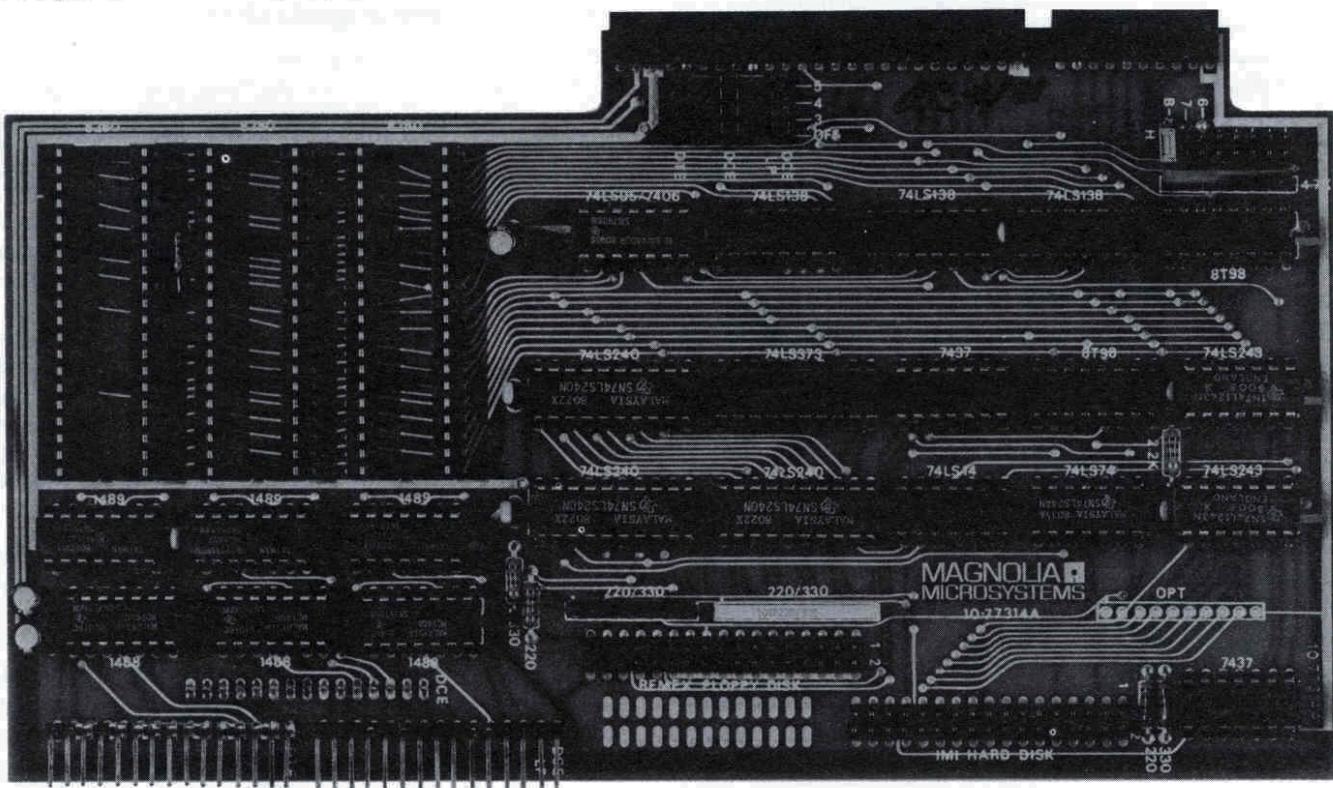


Figure 2
The Magnolia 77314 Corvus (IMI) Winchester Interface card.



read/write: First track 0 on side one, then track 0 on side two, and so forth.

Those who are contemplating switching from Heath/Zenith CP/M to Magnolia and wish to place their working files to a Winchester drive, should first transfer their files to an MMS CP/M formatted floppy disk via a conversion utility program before loading them onto a hard disk. One such program is called EMULATE, which is distributed by Analytical Products, 20663 Ave. 352, Wood Lake, CA 93286. This utility will read and write to more than 4 different CP/M formats and is worth investigating.

Now, before I wander too far afield from the intended scope of this article, we will now go through the procedure for setting up a hard disk using the Magnolia CP/M, 77320 SASI interface, and the Xebec hard disk controller. The hard disk data listed below is for both the Microscience HH-612 and Shugart SA-712, which are new half-height, low-power 10 MB Winchester drives. Part of the set-up procedure has been condensed from a booklet published by Floppy Disk Services (39 Everett Dr., Bldg. D, Lawrenceville, NJ 08646) and entitled INSTRUCTION MANUAL FOR INTERNAL AND EXTERNAL HARD DISK SYSTEMS FOR THE H/Z-89. It is one of the best idiot-proof manuals I have ever read, and it will be discussed in Part Four of this series when I will examine their internal hard disk system for the '89.

1. Turn on the '89. It should beep twice and the hard disk will begin to wind up. The LED on the hard disk may or may not flicker or be lit for the first 30 seconds. The Boot Syntax is Boot 0 for H/Z-17, Boot 46 for Z-37 or Boot 33 for MMS double-density.
2. Format and Sysgen a blank disk in drive B:. Copy all the utilities from your Master MMS CP/M disk. Reset the '89,

insert the System Volume you have just made and PIP the files from the SASI diskette to it.

3. Reboot your disk and run DEFSASI3.COM. After the program has loaded, the cursor will position itself at the first line titled SUBSYSTEM DATA. Hit the Return key and enter the following data:

Controller number	:	0
Controller mfg.	:	Xebec (enter #1 to get this)
Model	:	S1410 (enter #1)
Version	:	104683 (enter #2)
Logical unit number	:	0 (enter #0)
Drive mfg.	:	MSCI (enter #1 and type in MSCI) (or Shugart if applicable)
Model	:	HH-612 (enter #1 and type in HH-612) (or SA-712 if applicable)
Physical sector size	:	256 (enter 256)

Now hit the BLUE key on the '89 to save this info and return to the main menu.

4. Move the cursor to the DRIVE CHARACTERISTICS section using the up/down arrows on the keypad and hit the Return key. Using the guide below, enter the data as given:

Logical unit number	:	0
Type of media	:	F
Number of cylinders	:	306
Number of heads	:	4
Sectors per track	:	32
Control byte	:	14 (use 17 for SA-712)
Interleave factor	:	32
Expected format time	:	30
Exp. disk test time	:	10
Reduced write cyl.	:	0
Write precomp cyl.	:	0
ECC data burst length	:	11

- Hit the BLUE key to save the data and return to the main menu.
5. Position the cursor to the UPDATE DEFSASI3.DAT and hit return to save the data to the disk.
 6. Position cursor to DRIVE INITIALIZATION and hit return. The cursor will position itself in the desired starting location. Hit return for each item. Some of the functions are instant. Others will take a few minutes. All tests must finish with NO ERRORS. When complete, hit the BLUE key to exit to the main menu.
 7. Move cursor to the WRITE M320F210.HEX file and hit return to create this file on the disk.
 8. Then move cursor to EXIT TO CP/M and hit return.
 9. Now we must tell the system to recognize that the hard disk is present. This is accomplished by linking the new hex module as follows:
`A>LINK M320F210 MOVCPM <ret>`
 10. When the link is complete, immediately run MOVCPM. Then run SYSGEN. Since the new system is already in memory, it isn't necessary to "get" the system, only put it. In other words "RETURN" for source and "A" for destination. And since you have just re-syngened drive A, you must SHIFT-RESET and reboot.
 11. Now run the program DRIVES. This program may take several seconds to complete. Look for 2 devices, 50 and 51 in brackets. These are the numbers assigned to your new hard disk system. Make a note of the "letters" (not the numbers). They will be used in the next few steps. These numbers and letters will vary depending on the options in your particular system. If all goes well, the system reboots, the new hard disk will appear as the letter I: (eye). REMEMBER! The letter may be different on your system. In our examples, we will use the letters "I" and "J".
 12. Type the following: SCAN I:<ret>. Then, follow the directions on the screen. You will only have to hit return once for this operation. It may take from 5 to 15 minutes to perform this operation.
 13. When this function is complete, and no errors have been encountered, you must now SCAN J:<ret>. This will not take as long as I: since this partition is smaller than the other. Remember that the default partition is 8.1 MB for the first partition, and 1.5 MB for the second as CP/M can only address 8.1 MB maximum under this system. If you wish to partition the hard disk in a different way, refer to the Magnolia Manuals. If everything has gone well, both partitions should not show any error. Now you may PIP all files (*.*) to the hard disk by typing PIP I:=A:.* (during this operation any bad sectors found will be "mapped" out).
 14. In order to boot directly from the hard disk, we must set up the system to do so. Since you have just copied all the files from your master to the hard disk, log onto the first partition, I:<ret>, per the examples in the two previous sections. Remember that your assignment letters may vary.
 15. Run the SETUP.COM program and select the Logical/Physical Drive Assignments. Hit return.
 16. Under MMS CP/M, the first 5.25" drive (using the MMS controller) is designated as 33, then 34, 35, 36. If this is the case, the screen will display number 33 in parentheses. If you're using the Z-37 controller, the numbers would be 46, 47, 48,
49. In order to make the hard disk the first and second logical drives, enter 50 when the A: designator is on the screen. Then move the cursor down one and enter 51. Then down again and enter number 33, 34, etc., or 46, 47, etc., for the controller you are using. If you see any error messages at this time, simply ignore them. If your system is different from our examples, consult the Magnolia manual for assistance.
 17. Now press the "f3" key. This will clear any error codes. Then hit the BLUE key to update and exit to CP/M. To link the new boot module onto the hard disk, proceed as follows:
While logged on I:, type:
`I >LINK B320 MOVCOM <ret>`
When the link is completed, run MOVCPM. Then Sysgen and put the system from memory to drive I: Remember that the system is in memory, so just hit "return" for the question "Get system".
 18. Your new hard disk is now ready to boot. Hit SHIFT/RESET and enter "B" at the MMS: prompt, followed by the letter "E". This will echo as two letters — "EE". Hit return and your new hard disk should boot up.
- A final note of importance: When you first install your MMS 77320 SASI controller and the appropriate ROMs that come with this interface package, you must alter the dip switches on S501 on the CPU board according to the documentation.
- And, as mentioned earlier, obtaining the manufacturer's documentation for the hard disk drive you plan to purchase is of the utmost importance. The set-up parameters are vital, if you are to link them to your system volume. Without this information you will be unable to communicate with the hard disk.
- If possible, obtain a copy of the Xebec S1410 Owner's Manual. Many system integrators don't always supply this when you order the controller either separately or as part of a complete subsystem. Some, I've learned, don't have them to sell. They can be purchased from Xebec, P.O. Box 512, 432 Lakeside Drive, Sunnyvale, CA 94086. It provides a valuable source of information pertaining to pin-outs, error messages, SASI interface schematics, programming data, parameter information on some two dozen different ST506 compatible drives, and much more.
- In one of the future articles in this series, we will attempt to explain the significance of the hard disk parameters that your software looks for during set-up.
- For further information on the many Magnolia CP/M software products and fully operational Winchester subsystems MMS has to offer, write to:
- MAGNOLIA MICROSYSTEMS, INC.
4039 - 21st Avenue West
Seattle, WA 98199
- Our next installment will look at the Quikstor Winchester from Quikdata and the new standard Heath/Zenith CP/M and HDOS hard disk software they now have available. I welcome any comments and suggestions on this series. Please enclose a stamped reply envelope if I can assist you with any specific or technical information relating to your H-89 Winchester.
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