# 5 MEG PROFILE

# HDA FORMATTER

Profile Level 2 Technical Procedures

Contents:

Z8 Microprocessor

P 7

P 4

Figure 1 – Profile Controller Board



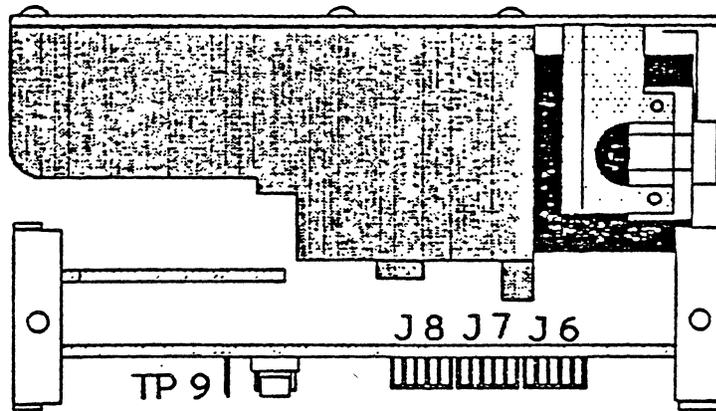TP 9    J 8 J 7 J 6

Figure 2 – HDA End View

## FORMATTING THE PROFILE HDA

**Equipment Necessary:**

    Format Firmware - Rev 18
    Jumper Wire
    Profile Format Diskette - Rev 12
    Profile Final System Test - Rev 23
    Frequency Counter
    Small Screwdriver
    IC Extractor
    Apple /// w/Profile interface and cable
    Known good Profile System minus the HDA.


**Procedure:**

1. Place the HDA to be formatted into a known good Profile system.  The
   controller should contain the piggy-back development type Z8 (shown in
   Figure 1).

2. Remove the System ROM from the piggy back on the Z8 then install the
   Format Firmware.  Locate the connectors J6, J7 and J8 (shown in Figure
   2) that connect the HDA to the analog board.  They are a constant
   source of problems.  Move the wires around and make sure that they are
   securely fastened to the connectors.  Connect an external LED to P4
   (shown in Figure 1).

3. Power up the Profile and allow 1 minute for the drive speed to
   stabilize.

4. To check the speed of the HDA, set up the frequency counter to display
   milliseconds, and connect the input of the frequency counter to TP9 on
   the analog card.  The frequency counter should read 16.67 milliseconds
   +/- .5%.  If it does not, adjust R3, on the side of the HDA (shown in
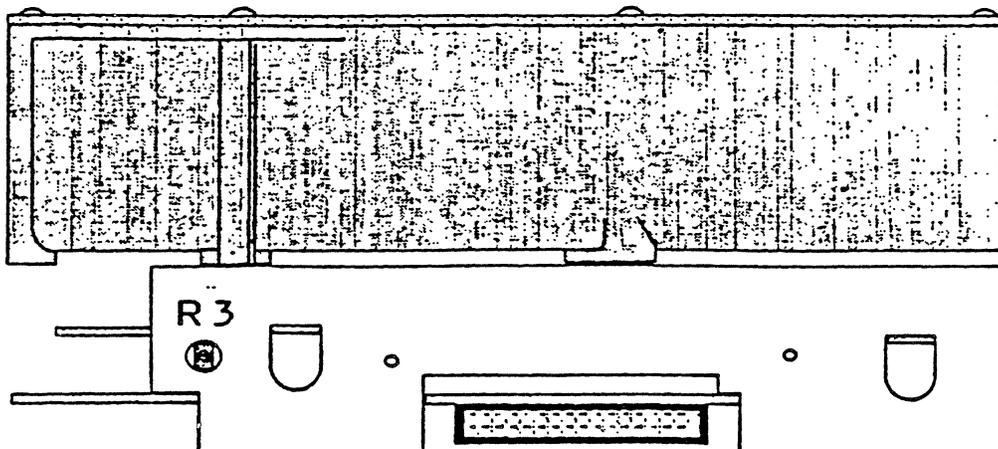   Figure 3) as close to 16.67 milliseconds as possible.
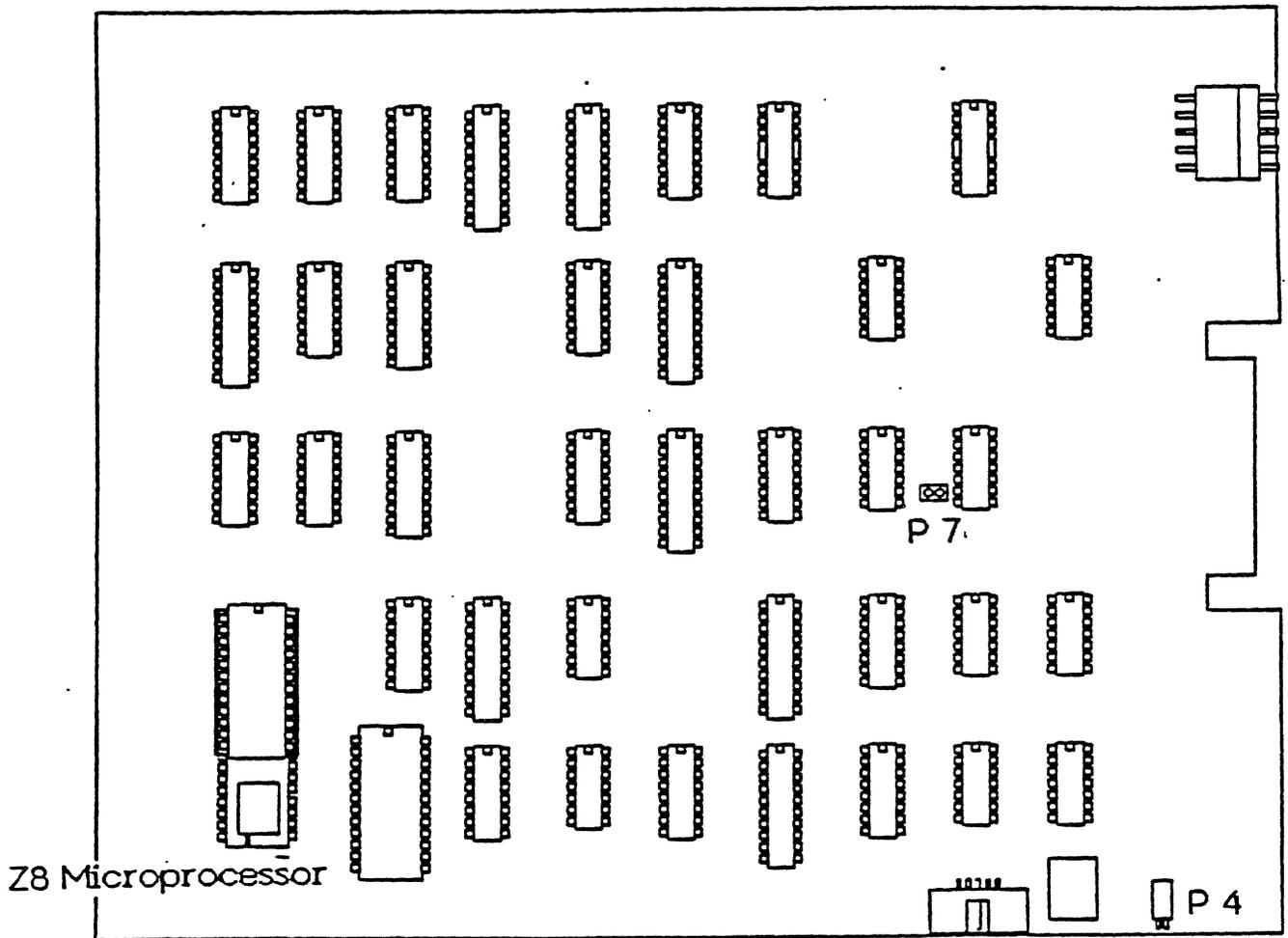


Figure 3 - HDA Side View

Figure 1 - Profile Controller Board

5. Install the Profile interface card into slot 1, and a Silentype Printer into Port A of the Apple ///. Connect the cable between the interface and the Profile.

6. Boot the Format/Certify Test diskette. When the program is loaded, the following message should appear:

   PRESS "RETURN" WHEN PROFILE IS READY

7. After the <RETURN> key is pressed, the following message will appear:

   INSTALL JUMPER, PRESS ANY KEY TO CONTINUE

8. Install a jumper between the two pins at P7 on the controller card and then press the <RETURN> key. Although the prompt says that you can press any key to continue, only the <RETURN> key will work.

9. When the <RETURN> key is pressed, the LED should start to flash and the stepper motor will step outward. The HDA surface is now being formatted.

10. After approximately 3 minutes, the HDA will be formatted and the following message will appear:

    REMOVE JUMPER, PRESS ANY KEY TO CONTINUE

    Remove the jumper wire from P7 on the controller card. Although the message again states that you may press any key to continue, only the <RETURN> key will work.

11. When the <RETURN> key is pressed the Profile will scan, certify and initialize the spares table on the HDA surface. The results of each process are reported on the printer, ending with the following pass or a fail message for the completion of the test:

    TEST COMPLETED, SYSTEM PASSES (FAILS)

    If the test fails, the HDA is defective and should be returned.

12. Power off the Profile and replace the Format Firmware with the 3.98 System Firmware (P/N 341-0008B) or with the masked Z8 microprocessor (P/N            341-00808

13. Power on the Profile, and observe that it goes though the power up sequence. When the LED is steadily on, boot the Profile Final System Test.

14. After the Final Test has booted, observe the printout on the Silentype. The following message is printed:

CONTROLLER VERSION NO. D3.98

Directly below, the printer will print:

SPARE SECTORS          BAD BLOCKS
      XX                   XX

The number under "SPARE SECTORS" (this should be SPARED SECTORS) is the number of sectors that have already been spared by the Profile. A spared sector is a logical block that has been assigned a new physical location because the old physcial location has reached an unaccectable error rate threshold during transfer operations. There are 32 spare sectors on the Profile that can be used for this purpose.

The number under "BAD BLOCKS" is the number of blocks that cannot be accessed at all. Any number here indicates a potentally bad Profile. If there are any bad blocks listed here, run the test and match it to the FST Results Chart at the end of this procedure.

15. After a 5 second pause, the final test will begin transferring blocks of data between the Apple /// and the Profile. Figure 1 illustrates the monitor display. The bottom line of the header is the status line, which returns the inforamtion about the current block being transferred. When an error occurs, the status will be printed on the bottom line of the monitor and on the Silentype.

16. After the test has completed 500,000 block transfers (about 24 hours), the test is completed. Use the FST Results Chart on the next page to determine the kinds of errors that have occurred and if the unit has passed or failed.
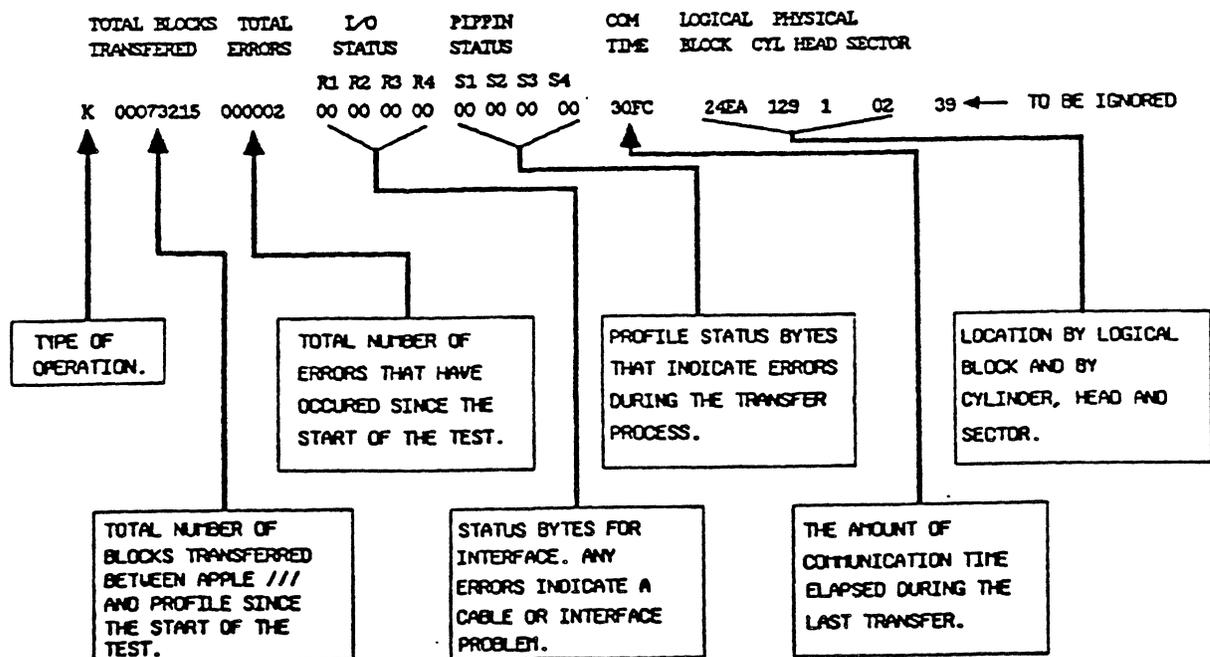


**Figure 4**

## Profile Status Bytes Description

### STATUS BYTE 1

7 = 1 if Profile did not receive 55 to its last response
6 = 1 if write or write/verify was aborted because more than 532 bytes of data were sent or Profile could not read the spares table.
5 = 1 if host data is no longer in RAM because Profile updataed its spares table.
4 = 1 if SEEK ERROR - unable in 3 trys to read 3 consecutive headers on a track
3 = 1 if CRC error (only set during actual read or verify of write/verify, not while trying to read headers after seeking)
2 = 1 if TIMEOUT ERROR (couldn't find header in 9 revolutions - not set while trying to read headers after seeking)
1 = N.C.
0 = 1 if operation was unsuccessful

### STATUS BYTE 2

7 = 1 if SEEK ERROR - unable in 1 try to read 3 consecutive headers on a track
6 = 1 if spared sector table overflow (> 32 sectors spared.
5 = N.C.
4 = 1 if bad block table overflow (greater than 100 bad blocks in table.
3 = 1 if Profile unable to read its status sector.
2 = 1 if sparing occured.
1 = 1 if seek to wrong track occurred
0 = N.C.

### STATUS BYTE 3

7 = 1 if Profile has been reset.
6 = 1 if block number is invalid.
5 = 1 if block ID at end of sector mismatch*
4 = N.C.
3 = N.C.
2 = 1 if Profile was reset*
1 = 1 if Profile gave a bad response.*
0 = 1 if parity error occured*

### STATUS 4

7 - 0 = the number of errors encountered when re-reading a block after any read error.

*This bits are set by the Profile driver.

# FST RESULTS CHART

The Profile under test FAILS if:

1. There are 26 or more soft errors.
   a. To identify a soft error look at the Profile Status bytes.

   ```
   S1  S2  S3  S4*    *S4 is a decimal number
   88  88  88  89  <-- S4 is less than 18
   ```

2. There are 6 or more hard errors on the Silentype printout of the following type:

   ```
   S1  S2  S3  S4*
   88  88  88  18  <-- S4 is equal to or greater than 18.
   ```

3. There are 2 or more lines on the Silentype printout that are seek errors:
   ```
   S1  S2  S3  S4*
   88  82  88  88
   ```

4. There are ANY of the following errors or the blocks transferred counter stops counting:

   UNIT FAILS
   BUFFER COMPARE ERROR
   INVALID RANDOM SEED

   Any error with an S1 that has an odd value.
   Any error where S1 equals 84
   Any error where S1, S2 or S3 has value of FF.

5. After the Profile Final System Test as been rebooted:

   The number of SPARE SECTORS is 16 or more.
   The number of BAD BLOCKS is 1 or more.