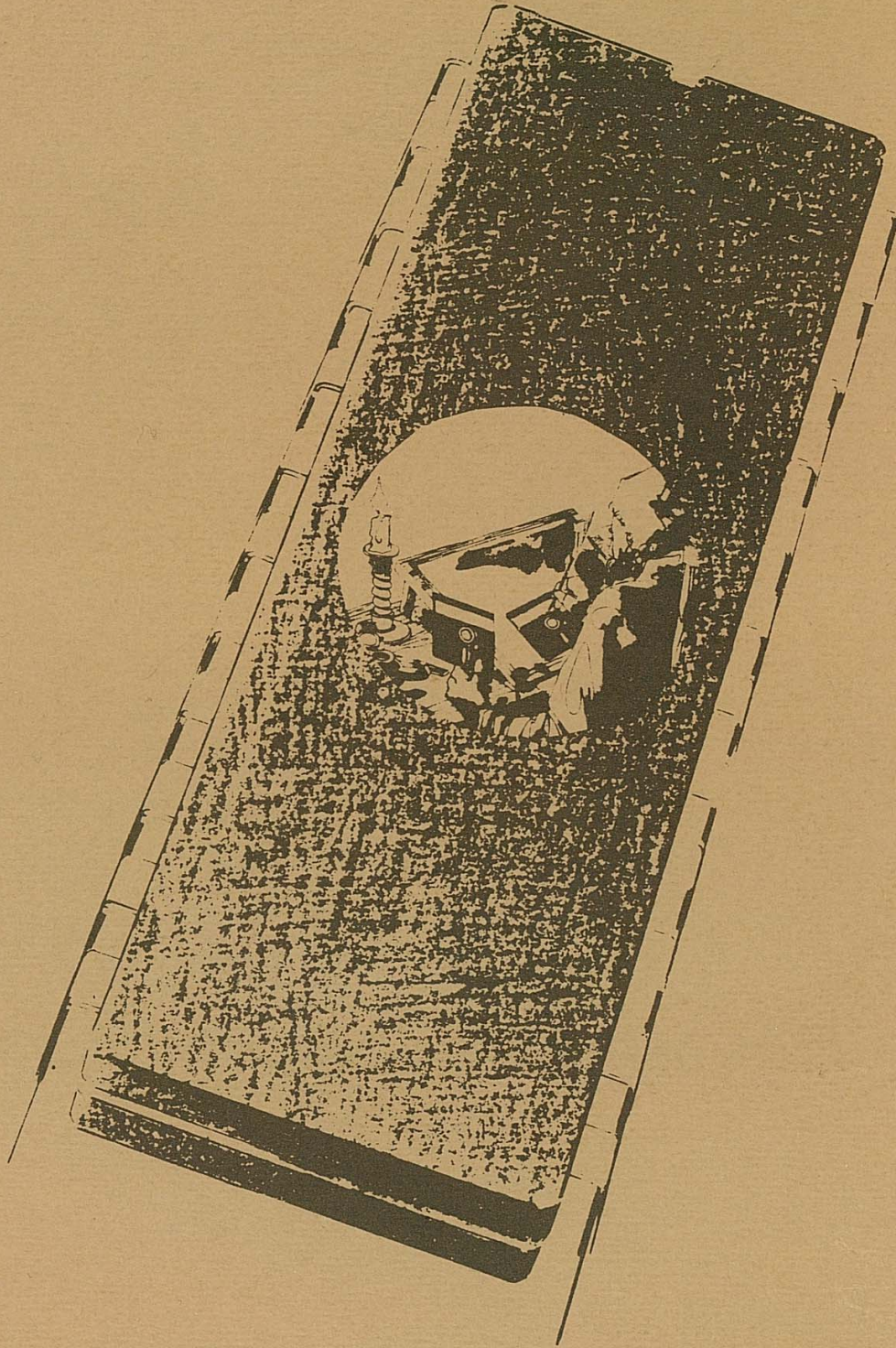# THE CHIP

INSTALLATION MANUAL

DISK BACKUP/DEVELOPMENT SYSTEM
DESIGNED FOR THE
ATARI 810 DISK DRIVE

NOTICE

Spartan Software of Minnesota Inc. reserves the right to make improvements in the product described in this manual at any time and without notice.

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NOTE

Installation of the CHIP will void any existing warranties regarding the 810 Disk Drive you have with Atari Inc. All risks taken by installing the CHIP will rest upon the purchaser, and not on Atari Inc., or Spartan Software of MN Inc.

CHAPTER 1
INTRODUCTION

The CHIP 810 Disk Drive modification along with the ARCHIVER/EDITOR program greatly expand the operating capabilities of the Atari® 810 Disk Drive. Special CHIP commands the ARCHIVER/EDITOR program to get at a wealth of information that never before has been possible. Sophisticated CHIP read/write/format/mapping commands added to the 810 Disk Drive allow the ARCHIVER/EDITOR program to duplicate any diskette, or create custom formats never before achieved by any software company. In addition, the ARCHIVER/EDITOR program allows the user easy access to the powerful capabilities designed into the CHIP.

The CHIP is a permanant replacement for the ROM currently in your 810 Disk Drive. The installation is straight forward and not very difficult, however, it does require three circuit board trace cuts and three jumpers. Therefore, if you have had little or no experience with a soldering iron, we STRONGLY urge that you either have a service center install it (dealer?) or get help from someone with the required experience.

Along with this manual, you will find a card containing a four digit code. This is the code that 'opens' your particular CHIP, and allows access to ALL nonstandard functions provided by the CHIP. The purpose of this code is to prevent unauthorized access (i.e. application programs) into the CHIP. Some programs do check for 'illegal' commands and will not work if the command succeeded. Thus, as a safety feature to the user, the CHIP modification functions identically to a standard (unmodified) 810 Disk Drive when not opened. As a convenience, the code need NOT be used when using the ARCH-IVER/EDITOR if the drive is properly booted (see section 2.1). The open code should be memorized and placed in a safe place.

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1.1 PURPOSE

It is NOT our intention to promote software piracy, in fact, we are strongly against this, and disregarding copyrights is STRICTLY AGAINST FEDERAL COPYRIGHT LAWS! Pirating tends to raise prices and discourage software companies, so PLEASE respect the software companies rights.

The reason for the production and sale of this product to the end user is for his/her own protection. With the price of software steadily increasing the backing up of original software is necessary because diskettes do fail whether due to physical damage, constant use, or magnetic fields nearby (i.e. your TV or monitor). Therefore, with the proper use of this product, you can be spared the grief of having your $50 program suddenly crash.

1.2 USER RIGHTS

The copying and distribution of the ARCHIVER/EDITOR program or the CHIP is forbidden under Federal copyright laws. However, we do strongly suggest that you backup the ARCHIVER/EDITOR program for yourself and store the original away in a safe place.

1.3 WARRANTY

If upon purchase the buyer finds that the CHIP or ARCHIVER/EDITOR prove defective, Spartan Software of MN Inc. will exchange it at no charge. If, at any time after 30 days from date of purchase, the CHIP or ARCHIVER/EDITOR program become defective, Spartan Software of MN Inc. will EXCHANGE it for a charge of $10 plus shipping.

There are no other warranties either expressed or implied.

CHAPTER 2
INSTALLATION

The CHIP is easily installed if you first read all of the following instructions and use the recommended tools. Use caution when making foil cuts and when installing the jumper wires. Solder splash or sloppy soldering can cause short circuits resulting in circuit component failure. When installing jumpers, trim exposed end of wire to 1/8 inch at each end to minimize the possibility of shorting to adjacent circuitry. Check, and double check, to be certain where to make foil cuts. Do the same double checking before installing jumper wires. Remember, patience is a working CHIP and haste is money out of your pocket for disk drive repairs.

CAUTION

The CHIP is shipped attached to a piece of dark conductive foam. This foam protects the CHIP from static discharge. Do not remove this foam until instructed to do so. Also, make sure that you are grounded and that you are not working in a carpeted area that could easily generate static electricity. Try to minimize any chance for causing a static discharge to the CHIP, diskette, or disk drive circuit components.

2.1 REQUIRED TOOLS

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*   25-30 watt soldering iron with a pencil tip end.

CAUTION

Do not use a soldering iron that is rated in excess of 30 watts. Don't heat solder joints for more than 15 seconds. Component damage can result from excessive heating.

*   Flat blade screwdriver.

* Fine 60/40 <u>ROSIN</u> core solder designed for electronic soldering.

* Phillips screwdriver (CAUTION: don't use magnetic tip screwdriver anywhere near Read/Write head or near diskettes).

* Wire stripper/cutter.

2.2 CHIP INSTALLATION PROCEDURE
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1. Disconnect I/O cables and power cable.

2. Set drive on clean work surface.

3. Carefully pry off the four plastic stickers (plugs) on the drive top cover. These stickers will be reused. Keep them in a dust free place until you have finished installing the CHIP.

4. Loosen the four screws in the drive top cover. Lift cover off drive and set it aside.

5. If you have never seen the inside of the disk drive, take time to look over the components as you read through the remaining steps. Don't perform any steps until you are sure you understand what to do.

    The long circuit board that has a metal box along its side is the side logic board you'll be working on. The foil side is facing towards the outside of the drive cabinet and the component side (with the metal box) is facing towards the inside of the cabinet.

CAUTION

Don't finger over IC's or other components needlessly. These circuits are static sensitive and any discharge from handling could cause circuit failure.

6. Notice how the dark plastic front plate slips into the grooved base. It is important that the front plate is correctly installed when you have to put things back together. Knowing this will make installation easier.

7. Remove the five phillips screws that secure the drive base plate to the base cabinet. Refer to figure 2-1.
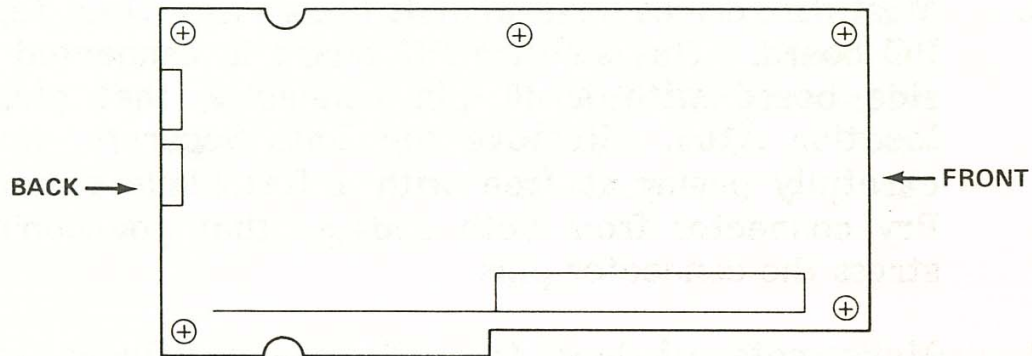

Figure 2-1. Drive Base Plate Mounting Screws

8. Remove the drive mechanism and front plate from the base cabinet. Place drive on clean work surface. Don't lose the rubber bumpers in the bottom of the base.

9. Mark the two connectors on the left side of the side board. These connectors are not polarized and can be easily switched around. Pull each connector off their respective pins.

10. Remove the three screws securing the side circuit board to the bottom board.

11. Carefully unplug the side circuit board from the bottom board. Place side board on a clean work surface.

12. Carefully bend back the three cover tabs securing the metal shield cover to the side circuit board. The tabs are on top of metal box and one tab is on the foil side towards the front of the circuit board. Then remove the two screws that clamp the board mounting support bracket, board, and shield together. Make note of how the bracket is positioned on the board. Remove the bracket and shield cover.

13. Most disk drives have what is known as a Data Separator PC board. This smaller PC board is connected to the side board with a 40 pin connector that plugs into location A105. Remove the Data Separator board by carefully prying it free with a flat blade screwdriver. Pry connector from both ends so that you don't over-stress the connector pins.

14. Make note of how the IC's are positioned in their sockets. (Look for notch on IC.) Also look for the IC identification numbers (e.g., A102, A103, etc.). Refer to figure 2-2.

15. Remove the IC at location A102 (below C107). Use flat blade screwdriver and carefully pry the IC from its socket. This IC will be later replaced by the CHIP.
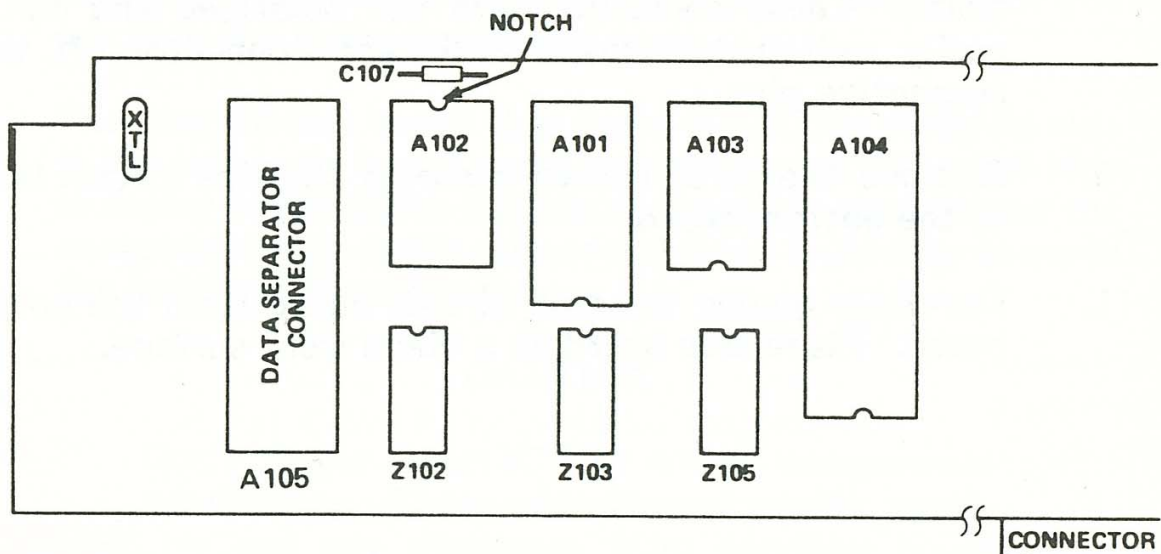

Figure 2-2. Side Board Component Locations

16.	Make the following three foil cuts. Refer to figure 2-3 for detailed instructions.

NOTE

Some older 810 Disk drives may have been updated with a modification to use the 2716 EPROM. If you have installed the 2716, the foil cuts were made then—check to be sure anyway. Also, remove any jumper wires and a transistor and diode that may be present on the foil side (non-component side). These components must be disconnected. They will not be used again.

Cutting circuit card foil is easily accomplished by using a hand-held routing tool or similar rotating engraver.

Securely hold board when making cuts. Avoid excessive vibration.

An alternative tool is a sturdy Xacto knife.

Remember to cut 1/16 inch wide path and to remove all foil.

#1 Cut the foil just where it goes to A102 pin 18.
(Make cut 1/8 inch to the right of pin 18.)

#2 Cut the foil just where it goes to A102 pin 20.
(Make cut 1/8 inch to the right of pin 20.)

#3 Cut foil path between A102 pin 21 and A101 pin 16.
This is a small, short foil path just left of A102 (pin 21) so look out of adjacent foil paths.
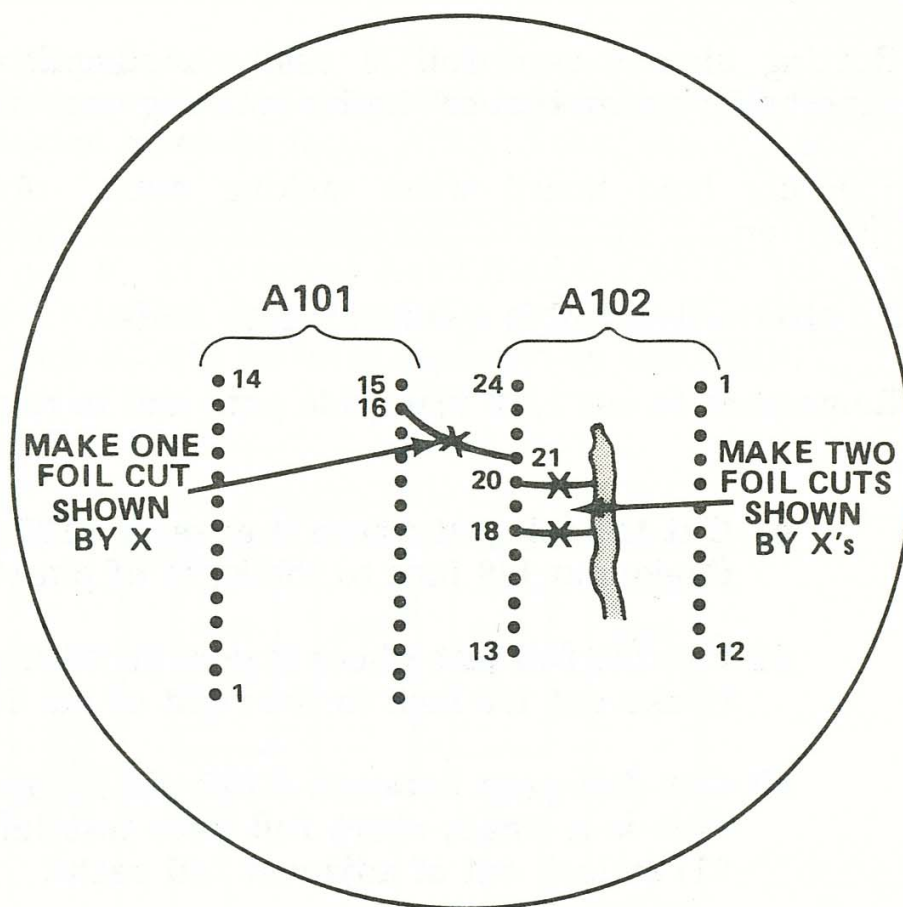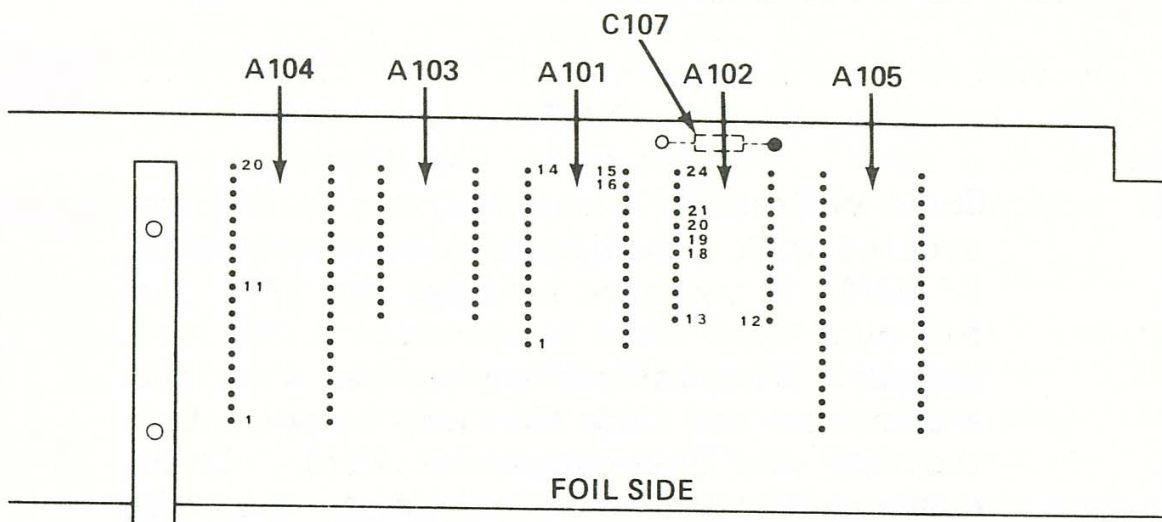
Figure 2-3. Foil Path Cutting Identification

17. Install the three jumper wires as follows. Refer to figure 2-4 for detailed instructions.

NOTE

If any other jumper(s) or components are on the foil side of this board, disconnect and remove them before proceeding. These modification components are not necessary after the CHIP is installed.

CAUTION

Avoid excessive heating of foil and adjacent components.

Do not use acid core solder! Be sure to use only fine rosin core solder that is designed for electronic soldering.

Also, make sure that solder splash or bridging is not present and that the end of each jumper is not shorting to adjacent circuitry.

#1 Jumper A104 pin 11 to A102 pin 21.

#2 Jumper Z103 pin 2 to A102 pin 20.

#3 Jumper A102 pin 18 to foil edge hole next to C107. This hole is at top edge of the circuit card which is the circuit ground (widest foil along card edge). Not all drives have an open ground hole next to C107. If necessary, solder the jumper to the ground lead on C107 (this lead connects to the widest circuit path on the top edge of the PC board). Make sure that you solder this jumper to the circuit ground path foil.

Figure 2-4. Jumper Wire Installation

18. Remove the conductive foam from the CHIP and install the CHIP in IC socket A102. Refer to figure 2-5. Be sure that notch at end of CHIP is towards the top edge of the board. This is the opposite of most other IC's on the board. Be careful not to bend pins. If you do bend any pin(s), take the CHIP out and straighten the pins and try again.

19. Re-install Data Separator Board to the side board (plugs into connector at A105). Use care not to bend connector pins.
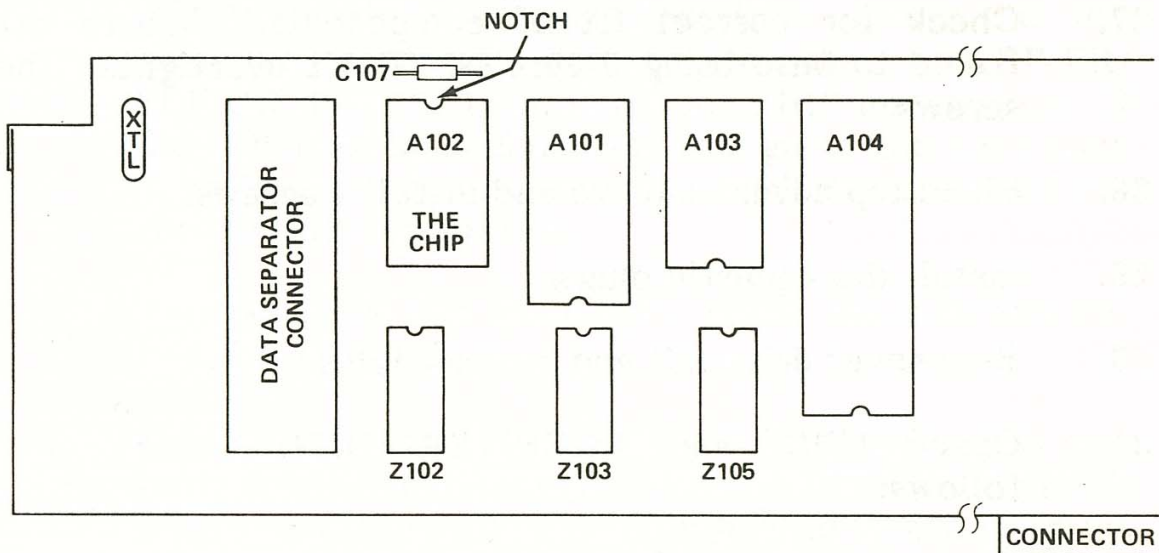

Figure 2-5. Identification of Components on Side Board

20. Re-assemble metal shield to side board. Carefully bend back all three tabs on shield cover.

21. Secure mounting bracket (on foil side) to side board using two screws through component side of the board.

22. Install the two connectors removed in step 9. Be careful of plug-to-connector pin phasing. Be sure they are on the correct pins.

23. Push the side board edge connector onto bottom board connector pins.

24. Install three screws to secure side board to the drive frame.

25. Put one screw in the left front hole of the drive frame (next to the Busy light).

26. Place drive front plate on front of drive mechanism. Hold in place and lift drive mechanism and front plate into lower base. Front plate must go into grooves.

27. Check for correct fit of components. Secure drive frame to base using 5 screws. Don't overtighten these screws.

28. Place top cover on drive and install 4 screws.

29. Install the 4 plastic plugs.

30. Reconnect drive I/O and power cables.

31. Check CHIP and ARCHIVER/EDITOR operation as follows:

    a) Remove cartridge from left slot of your computer.

    b) Do not insert the ARCHIVER/EDITOR diskette or any other diskette yet. Remove any diskette in drive. If a diskette is in the drive and the CHIP was improperly installed the drive may attempt to write to the diskette (even if the diskette is write protected!). This could ruin the disk program.

c) Turn power to the disk drive on. Now, listen for the head movement. The head should extend to track 0 and immediately retract to track 39. This is the normal CHIP boot procedure. After 5-6 seconds the drive motor should shut off and the BUSY light should go out. If you didn't hear the head move in and out and/or the drive motor does not shut off, something is incorrectly installed or the trace cuts are incorrect. Recheck the installation steps. If the drive passes these tests, go to the next step.

d) Before trying the ARCHIVER/EDITOR you should boot up the system with a DOS diskette to be sure that the CHIP is properly installed. Doing this will minimize potential damage to the ARCHIVER/EDITOR diskette from improper CHIP installation. If the DOS boot up was normal then go to the next step. If problems exist remove the DOS diskette and recheck CHIP installation.

e) Shut power to the drive off. Insert the ARCHIVER/EDITOR diskette.

f) Turn on drive power. After the Busy light goes out, turn on the computer. The ARCHIVER/EDITOR program will be automatically booted in and program title page screen should appear. If it does, congratulations on doing a good job. You now can go to the CHIP USER'S manual to use all of the features of the CHIP and the ARCHIVER/EDITOR.
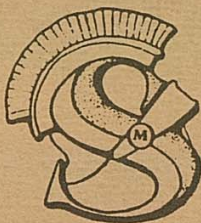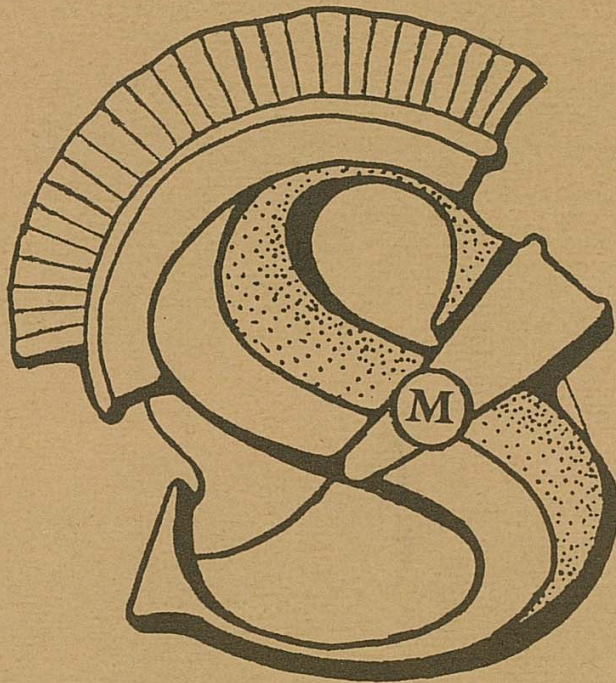
NOTE

Before using any software program after the CHIP has been opened, first power off the drive to close the CHIP and then follow normal diskette booting practices. Otherwise problems may result when loading programs.

However, if you are unable to get the ARCHIVER/ EDITOR screen, it's time to power off and go back to step 1 of this procedure and recheck all foil cuts, jumpers, IC installations, etc.

Also, check for proper installation of the two connectors and the main board to base board connector installation. If all else fails, please call or write to:

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Crystal, MN 55422
    ATTN: Service Dept.
(612) 448-7042