Screamer™

MICRO Sync™

SCREAMER

Revision A

Microsync, Inc.
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Carrollton, TX 75011
214-492-5265

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Contents

How Does the Screamer Work?

Your computer's operation is made up of many separate tasks: processing, I/O, DMA, etc. The Screamer continuously monitors which task your computer is performing and instantaneously adjusts the computer's speed so that it is always running as fast as possible for that particular task. For example, during processing, your computer will run at the fastest speed, 8 MHz. I/O is the slowest operation running at the normal speed of 4.77 MHz. When accessing memory, your computer will run at some speed in between; the exact speed depends on the particular memory chips that you have.

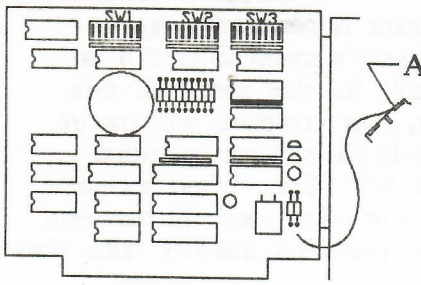
Hardware and Software Requirements

IBM[R] PC or XT computer with at least one 360KB disk drive. DOS 2.0 or later. Requirements for IBM compatibles: Both the processor (8088 or 8086) and the clock chip (8284) must be in sockets.

The Screamer is compatible with other expansion boards. However, if any of them contain a clock, that clock must be disabled. Refer to the expansion board's manual for how to do this.

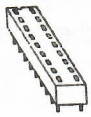
Parts List

Your Screamer package contains the following parts:



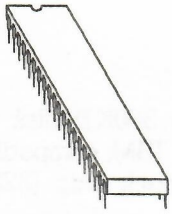
Attached Metal Clip

Screamer Board

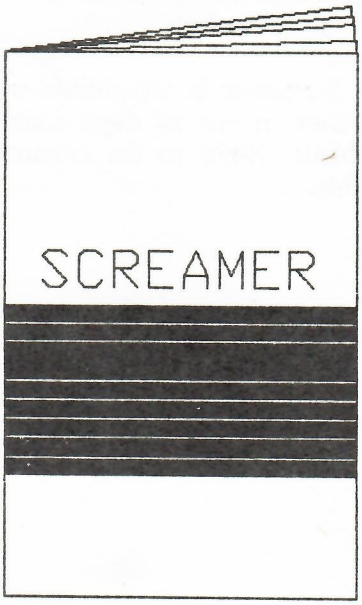


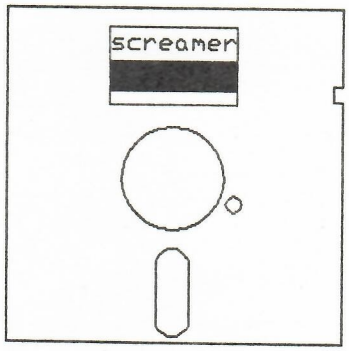
Socket (PC only)

Separate Metal Clip (XT only)



V20 Chip



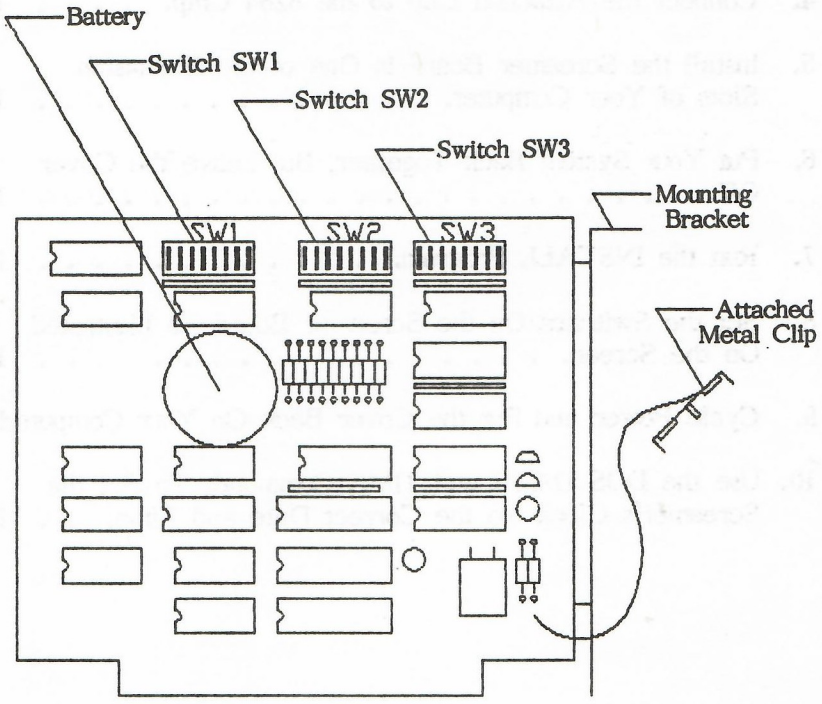


Diskette

Manual

Board Layout

The following figure shows the Screamer board layout. Parts that you'll need to access are labeled.



Installation Overview

Summary of Use

Using the Screamer will normally be totally transparent.

You can switch between the Screamer's fast speed (8 MHz) and the normal speed of your computer (4.77 MHz) by typing "SCREAMER" when the DOS prompt is on the screen. Or, you can load SCREAMER as a memory resident program and change speeds without exiting your current program by pressing <Shift-Ctrl> for the fast speed or <Shift-Alt> for the normal speed.

NOTE: If you have an IBM compatible computer, follow the instructions for the IBM PC.

1. Prepare for Installation.

1a. Have the following tools ready:

- Medium-size, flat-blade screwdriver
- Small-size, flat-blade screwdriver
- 1/4-inch nutdriver (optional)
- 3/16-inch nutdriver (optional)

1b. Turn Off the system unit power switch and the power switches on any peripherals (monitor, printer, etc.).

1c. Unplug the system unit's power cord from the wall outlet.

1d. Unplug all peripheral's cords from the back of the system unit.

1e. Remove the cover mounting screws from the rear of the system unit using the medium-size, flat-blade screwdriver or 1/4-inch nutdriver. Depending on the model of IBM computer that you have, there will be either two screws--in the lower corners, four screws--one in each corner, or five screws--one in each corner plus one in the center top.

1f. Slide the system unit cover towards the front. When the cover will go no further tilt it upwards and lift up to remove it completely.

2. Replace the 8088 Processor Chip With the V20 Chip.

2a. Looking down onto the system unit from above, locate the 8088 integrated circuit chip (for the XT, see the figure on page 8; for the PC, see the figure on page 9).

- First find the power supply in the corner closest to the power switch. The power supply is the silver metal box with the caution sticker on the top.

- Next to the power supply on the bottom of the unit at the rear will be an empty 40-pin socket (this socket will contain an 8087 chip if your computer is so equipped). This cavity of your computer may contain some cabling. Make a note of the position of each cable and what it's connected to. Then remove all of the cables so that you can get at the motherboard to locate the empty socket.

- Right next to the empty socket will be another 40-pin socket containing the 8088 chip. The numbers "8088" will be printed on the top of the chip.

2b. Remove the 8088 chip from its socket by wedging the small-size, flat-blade screwdriver or similar object between the chip and its socket and prying STRAIGHT upwards on both ends of the chip. CAUTION: While removing the chip and while the chip is out of your computer take care not to bend any of its metal legs. Make sure that you do not remove the socket. You do not need this chip anymore; store it in a safe place.

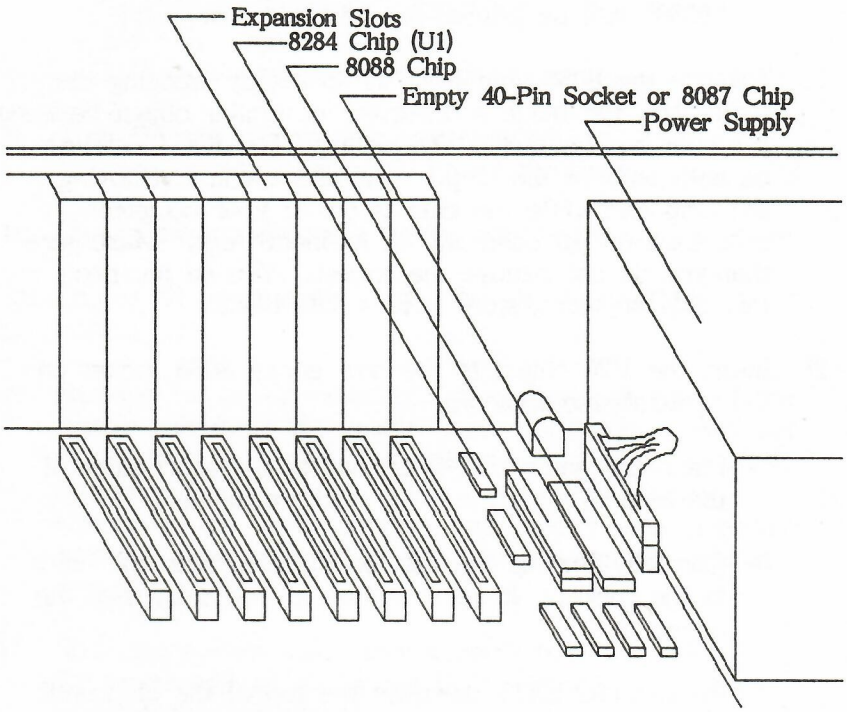
2c. Insert the V20 chip into the now empty 8088 socket on the system's motherboard.

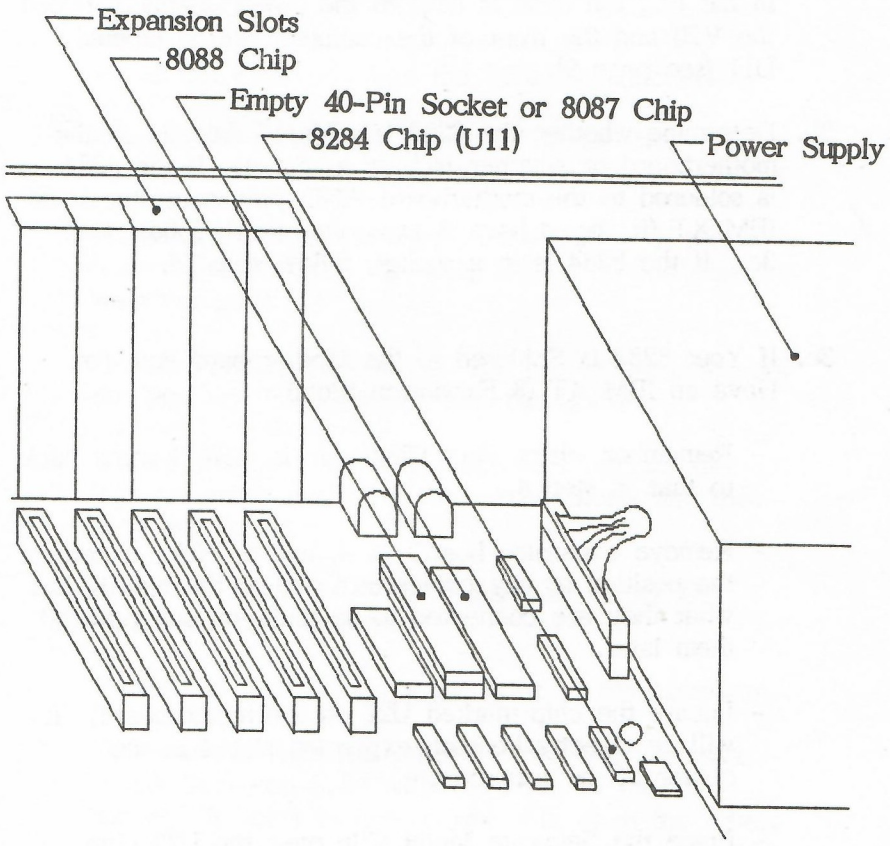
- Place the notch that is on one of the short sides of the chip towards the back of the computer.

- Carefully line up the legs on the chip with the holes in the socket. It helps to line up one side, then the other.

- Press STRAIGHT down on the top of the chip until the legs are fully inserted into the socket.

- Check the installation to make sure that all the legs are fully inserted in the proper holes and that none are bent.


Expansion Slots
8284 Chip (U1)
8088 Chip
Empty 40-Pin Socket or 8087 Chip
Power Supply


Expansion Slots
8088 Chip
Empty 40-Pin Socket or 8087 Chip
8284 Chip (U11)
Power Supply

3. Modify the 8284 Clock Chip So That It Will Run at 8 MHz. If you have an IBM XT, attach the Separate Metal Clip to the chip labeled U22. If you have an IBM PC, install the Socket between the chip labeled U11 and the motherboard.

3a. Looking down onto the system unit from above, locate the 8284 integrated circuit chip. In the XT, the 8284 is between the V20 and the expansion slots towards the back of the computer and is labeled U1 (see page 8). In the PC, the 8284 is next to the power supply between the V20 and the front of the computer and is labeled U11 (see page 9).

3b. Determine whether the 8284 is soldered directly to the motherboard or whether it is in a socket. If the 8284 is soldered to the motherboard AND your computer is an IBM XT (it should have 8 expansion slots), follow step 3c. If the 8284 is in a socket, follow step 3d.

3c. If Your 8284 Is Soldered to the Motherboard and You Have an IBM XT (8 Expansion Slots)

- Remember where your 8284 chip is. We'll come back to that in step 4.

- Remove expansion boards 3, 4, and 5. Make a note of the position of any cables attached to the boards and what they are connected to so that you can reinstall them later.

- Locate the chip marked U22 on the motherboard. It will be directly beneath expansion slot 4 in the center of the computer.

- Place the Separate Metal Clip over the U22 chip matching the dot on the Clip to the notch on the chip (it will be pointing towards the back of the computer). Press straight down until it snaps into place.

- Verify that the Clip is indeed making good contact with the chip.

- Go on to step 4.

3d. If Your 8284 Is In a Socket

- Remove the 8284 chip from its socket by wedging the small-size, flat-blade screwdriver or similar device between the chip and its socket and prying STRAIGHT upwards on both ends of the chip. CAUTION: While removing the chip and while the chip is out of your computer take care not to bend any of its metal legs. Make sure you do not remove the socket.

- Place the 8284 chip into the Screamer Socket.

  -Match the notch that is on one of the short sides of the chip with the notch in the Socket.

  -Carefully line up the legs on the chip with the holes in the Socket. It helps to line up one side, then the other.

  -Press STRAIGHT down on the top of the chip until the legs are fully inserted into the Socket.

  -Check the installation to make sure that all the legs are fully inserted in the proper holes and that none are bent.

- Install the Socketed 8284 in the now empty U11 socket in your computer.

  -Place the notch towards the back of the computer.

  -Line up the legs that protrude from the underside of the Socketed 8284 with the holes in the U11 socket. It helps to line up one side, then the other.

  -Press STRAIGHT down on top of the Socketed 8284 chip until it is fully inserted.

  -Check the installation to make sure that all the legs are fully inserted in the proper holes and that none are bent.

4. Connect the Attached Clip to the 8284 Chip.

4a. In the IBM XT, remove expansion boards 7 and 8. Make a note of the position of any cables attached to the boards and what they are connected to so that you can reinstall them later.

4b. Place the Attached Clip over the 8284 chip matching the dot on the Clip to the notch on the chip (it will be pointing towards the back of the computer). Press straight down until it snaps into place.

4c. Verify that the Clip is indeed making good contact with the chip.

5. Install the Screamer Board In One of the Expansion Slots of Your Computer.

5a. You can install the Screamer in any unused slot that the wire coming from the 8284 chip will reach to. If you are installing the Screamer in slot 8 of the XT (the short slot closest to the power supply), turn switch SW1-2 On. If you are installing the Screamer in any other slot of the XT or in the PC, verify that Switch SW1-2 is Off.

5b. Use a medium-size, flat-blade screwdriver or a 3/16-inch nutdriver to remove the screw from the expansion slot cover of the expansion slot that you want to use.

5c. Hold the Screamer board at the top and insert it into the expansion slot.

5d. Replace the screw to hold the mounting bracket to the rear of the system unit.

6. Put Your System Back Together, But Leave the Cover Off.

6a. Reinstall all expansion boards and cables.

6b. Plug your peripherals into the back of the system unit.

6c. Plug in the system unit's power cord.

6d. Leave the cover Off at this point so you can set the switches on the Screamer board after running the INSTALL program.

6e. Turn On the system unit power switch and the power switches on any peripherals. If your computer does not come on, check that the unit is plugged in. Then check to see that the V20 and the 8284 are fully inserted into the motherboard, the 8284 is fully inserted into the Socket (PC only), that all the legs on the chips line up with the holes in the socket, and that none of the legs are bent. If any of the legs are bent, use needle-nose pliers to straighten them. Be VERY careful not to bend them so much that they break.

Also, check the setting of the switches. SW1-3, SW1-5, and SW1-6 should be On. All others should be Off. For the setting of SW1-2, refer to step 5a above.

7. Run the INSTALL Program.

7a. If the DOS prompt (usually A> or C>) is not on the screen, boot DOS from diskette or from your fixed disk by turning your computer On or rebooting (<Ctrl> + <Alt> + <Del>). Disable any memory resident programs that may be running.

7b. Insert the Screamer diskette in drive A. Close the door.

7c. Change to drive A if you're not already there:

```
A: <Enter>
```

7d. Type:

```
INSTALL <Enter>
```

Several messages will appear on the screen:

```
Testing 576K-640K
    .
    .
    .
Testing 128K-196K
Testing Video Ram
Testing Post Rom
Testing Bios Rom
Testing 064K-128K
Testing 000K-064K
Testing DMA
```

7e. The program will then ask you which drive you want to install the Screamer on:

```
Install Screamer on which drive? [C:]
```

Press Enter to install the Screamer on your fixed disk, drive C. Or type:

```
A: <Enter>
```

to install the Screamer on a floppy diskette in drive A, or:

```
B: <Enter>
```

to install the Screamer on a floppy diskette in drive B.

7f. A diagram of how to set the switches on the Screamer board appears. Then the messages:

```
Creating Screamer Subdirectory
Copying Screamer Files
Updating CONFIG.SYS
Updating AUTOEXEC.BAT
Screamer installed.

Please set switches on Screamer
board as shown.
```

8. Set the Switches On the Screamer Board As Illustrated On the Screen.

8a. Use a pencil or pen to press down on the side of the switch that the arrow is pointing to. You do NOT need to turn the power off: if you do you will lose the display. Remember, if you are installing the Screamer in slot 8 of the IBM XT, switch SW1-2 will be On; otherwise, it will be Off. (This must be done before you run INSTALL.)

8b. Remove the Screamer diskette from drive A and store it in a safe place.

9. Cycle Power and Put the Cover Back On Your Computer.

9a. Turn Off the system unit's power switch.

9b. Put the cover back on your system unit by reversing the actions in step 1f.

9c. Turn On the system unit's power switch. (Cycling power causes the Screamer to start running at the fast speed.)

10. Use the DOS DATE and TIME Commands To Set the Screamer's Clock To the Correct Date and Time.

10a. Use the DOS DATE command to set the desired date. For example, to set the date to August 18, 1986, enter:

```
DATE 8-18-86 <Enter>
```

10b. Use the DOS TIME command to set the desired time. For example, to set the time to 7:05 P.M., enter:

```
TIME 19:5 <Enter>
```

10c. You have now finished installing the Screamer.

The DEMO program demonstrates the difference between the Screamer's fast speed and the normal speed of your computer.

1. Insert the Screamer diskette in drive A.

2. Change to drive A if you are not already there:

   A: <Enter>

3. Type:

   DEMO <Enter>

   After approximately 10 seconds, the message "Average speed is n.n times faster than normal" will appear on the screen.

4. Press <N> to test your computer at the normal speed. At the normal speed, n.n will be approximately 1.1. The 10% improvement is due to the 8 MHz V20 that you installed. Press <F> to test your computer at the fast speed. n.n should be in the range of 1.5 to 1.9. Press <Esc> to exit the DEMO program.

Changing Speeds

The Screamer normally starts up in the fast mode. The SCREAMER command is used to change speeds between the normal 4.77 MHz and the faster 8 MHz speed and also allows you to load the speed switching program as a memory resident program.

To run the program, type:

SCREAMER <Enter>

Four options appear on the screen.

Press <N> to change to the normal speed. You'll hear two beeps--high, then low. If you are already at the normal speed, you'll hear two low-pitched beeps. The DOS prompt will be returned. You can also change to the normal speed by typing "SCREAMER /N".

Press <F> to change to the fast speed. You'll hear two beeps--low, then high. If you are already running at the fast speed, you'll hear two high-pitched beeps. The DOS prompt is returned. Or, you can change to the fast speed by typing "SCREAMER /F".

If you want to be able to change speeds from the keyboard without exiting your current program, load SCREAMER as a memory resident program. To do this, press <M>. Or, simply type "SCREAMER /M". You can then press the keys <Shift-Ctrl> to switch to the fast speed (press and hold <Shift>, then press <Ctrl>, then release both keys). Or, press <Shift-Alt> to switch to the normal speed.

To unload the SCREAMER program from memory, press <D>. Or, type "SCREAMER /D". The message:

```
Screamer speed switch disabled.
```

will appear.

You may want to load SCREAMER as a memory resident program every time you boot your computer. To do this, include the line:

```
SCREAMER /M
```

in your AUTOEXEC.BAT file. The SCREAMER command must appear after the PATH command.

Installing the Screamer On Additional Diskettes

If you have more than one floppy diskette that you boot from, you'll want each one to contain the necessary Screamer files, CONFIG.SYS, and AUTOEXEC.BAT. To install the Screamer on additional diskettes, insert your Screamer diskette in drive A and type:

```
INSTALL <Enter>
```

Insert the desired boot diskette when prompted. Ignore the message "Please set switches on Screamer board as shown"; you only need to set the switches once.

Screamer Files

The Screamer diskette contains the following files:

DEMO.EXE	Demonstrates the difference between the fast and slow speeds on your particular computer. This program is not needed for the Screamer's operation.
INSTALL.EXE	Installs the Screamer by testing the speed at which your computer can do various tasks, making the directory \SCREAMER, copying the necessary files to your boot disk, modifying your CONFIG.SYS and AUTOEXEC.BAT files, and showing you how to set the switches on the Screamer board. This program is not copied to the Screamer directory on your boot disk; it is needed only to install the Screamer.
SCLOCK.SYS	Device driver for the Screamer's clock.
SCREAMER.COM	Program that changes your computer's speed between fast and normal.

In order to use the Screamer, you need the following files. These files are set up automatically by INSTALL.

1. A \SCREAMER directory containing the files SCLOCK.SYS and SCREAMER.COM.

2. A CONFIG.SYS file containing the line "DEVICE=\SCREAMER\SCLOCK.SYS".

3. An AUTOEXEC.BAT file containing the line "PATH=\SCREAMER" and optionally, if you want the SCREAMER program to be memory resident each time you boot, the line "SCREAMER /M" after the PATH command.

Screamer Files

The Screamer diskette contains the following files:

DEMO.EXE — Demonstrates the difference between the fast and slow speeds on your particular computer. This program is not needed for the Screamer's operation.

INSTALL.EXE — Installs the Screamer by testing the speed at which your computer can do various tasks, making the directory \SCREAMER, copying

Switches

SW1-1 — Speed at which computer boots when powered on. On = fast (8 MHz). Off = normal (4.77 MHz).

SW1-2 — On only when installed in slot 8 of the IBM XT. Off in all other cases.

SW1-3 — Always On.

SW1-4 — Not used.

SW1-5 & SW1-6 — Normal speed of computer. Both always On = 4.77 MHz.

For all remaining switch pairs:
Both On = 4.77 MHz
Odd-numbered switch On, even-numbered switch Off = 6 MHz
Both Off = 8 MHz
A bank is 128K.

SW1-7 & SW1-8 — Speed of DMA.

SW2-1 & SW2-2 — Speed of Bank 7--System ROMS.

SW2-3 & SW2-4 — Speed of Bank 6.

SW2-5 & SW2-6 — Speed of Bank 5--Video RAM.

SW2-7 & SW2-8 — Speed of Bank 4--RAM.

SW3-1 & SW3-2 — Speed of Bank 3--RAM.

SW3-3 & SW3-4 — Speed of Bank 2--RAM.

SW3-5 & SW3-6 — Speed of Bank 1--RAM.

SW3-7 & SW3-8 — Speed of Bank 0--RAM.

Installing new memory in your computer will cause the switch settings required by the Screamer to change. If you ever install new memory you'll need to run the INSTALL program again, then reset the switches as indicated on the screen.

Before you run INSTALL, switches SW1-3, SW1-5, and SW1-6 should be set to On. All other switches should be Off. For the setting of SW1-2, refer to step 5a above.

Check the date and time every once in a while with the DOS DATE and TIME commands to make sure that the Screamer's clock is still keeping accurate time. If it is not, check whether the metal clip of the battery holder is touching the battery. If the clip is not touching the battery, bend the clip so that the two make contact. If the clip is touching the battery, your battery may need replacing.

3 volt, lithium batteries can be purchased at an electronic supply store or can be ordered from Microsync, Inc., P.O. Box 116302, Carrollton, TX 75011. The battery supplied with the Screamer is 200mAH (part number CR2430 or equivalent) and will last approximately 5 years. 160mAH batteries (part number BR2325, CR2325, CR2320 or equivalent) are more readily available at local electronic supply stores and can also be used, however, they will not last quite as long.

To replace the battery:

1. Remove the battery from the battery holder (see the figure on page 3) by sliding the battery out from under the metal clip.

2. Place a new 3 volt, lithium battery under the metal clip in the battery holder. Place the + (positive) side up and the - (negative) side towards the Screamer board.

3. Use the DOS DATE command to set the desired date. For example, to set the date to August 18, 1986, enter:

```
DATE 8-18-86 <Enter>
```

4. Use the DOS TIME command to set the desired time. For example, to set the time to 7:05 p.m., enter:

```
TIME 19:5 <Enter>
```

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