User's Manual

D486 Rel. II CPU Card

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Texas Microsystems, Inc., could void the user's authority to operate the equipment.

Preface

Texas Micro's Model D486 CPU Card is a 33-100 MHz single-board computer with multi-function I/O control, including IDE and floppy drive controllers plus serial and parallel ports. The D486 is functionally equivalent to the IBM/AT computer and can be inserted into a passive backplane configured in accordance with the IBM/AT Bus standard. It can be operated with all AT-compatible accessory cards, such as serial and parallel I/O cards, video and disk controllers, etc. Features of the D486 include:

- Supported processors include 33 and 50 MHz 486DX, 50 and 66 MHz 486DX2, and 100 MHz DX4
- Secondary write-back cache support with 128 KBytes of data RAM (expandable to 256 KBytes)
- Up to 64 MBytes of DRAM supported in 4 x 36 SIMM modules
- 128 KBytes of flash memory for BIOS and user-application field upgrades
- Auxiliary boot ROM (in instances of Flash programming error or failure)
- IDE hard drive interface, allowing control of high-speed, high-capacity disk drives
- 3.5" and 5.25" floppy disk drive controller
- Two (2) IBM PC/AT-compatible RS232 serial ports, each with internal baud rate generation
- One (1) parallel port with bi-directional transfer capability or unidirectional printer directed output

HOW TO USE THIS MANUAL

Thank you for purchasing Texas Micro's D486 CPU Card. Your D486 User's Manual is designed to provide easy access to information you need to operate the D486 CPU Card. It's also designed to accommodate all levels of users - from the novice to the experienced professional.

The D486 is configured for operation at the Texas Micro factory. When you receive your D486, it's ready to be installed and used. This manual will guide you step-by-step through the procedures required to operate the D486.

INEXPERIENCED USERS

Computer novices should use this manual as a training and reference tool as well as an installation/operation guide. Begin by reading Chapter 1, *Getting Started*. This chapter will describe the D486 and its components. It will also provide information necessary to verify the D486's hardware configuration. Continue with Chapters 2, *D486 Installation*, and 3, *Connecting Peripherals*. By completing the steps outlined in Chapters 1, 2 and 3, you will have prepared the D486 for operation. Proceed with Chapter 4, *Power-up*.

Power-up will tell you what happens when power is introduced to the D486 and will guide you to Chapter 5, *Using the Setup Utility*, which will tell you how to verify the D486's configuration. After you complete this chapter, you will be ready to place the D486 into operation. Later, you may decide that you need extra memory. Chapter 6, *Memory Configuration*, provides information.

Finally, Chapter 7, *General Maintenance*, provides guidelines for returning Texas Micro products for service or repair. If you have any questions, call our Technical Support Department at 1-800-627-8700 or 1-713-541-8200 between 7 a.m. and 6 p.m., Central Time. You will be prompted to press "3" to enter the Technical Support queue.

ADVANCED USERS

The D486 User's Manual provides a "quickstart" path for advanced users. Read the *QuickStart* segment following Chapter 4.

The *QuickStart* segment will give a short outline of the installation and startup procedure. It will direct you to check switch and jumper settings as well as the D486 Setup Utility configuration. Appropriate chapters will be referenced.

Once you've verified the hardware configuration, installed the board, introduced power to the D486 and checked the Setup Utility, you can place the D486 into full operation. You can then use the manual as a reference guide.

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CHAPTER 1   Getting Started

This chapter is designed to provide you with enough information to verify the configuration of the D486 and prepare the board for installation and operation. However, advanced users can skip to the *Quickstart for Advanced Users* segment immediately following Chapter 4.

Let's begin by describing some of the D486's main components. Figure 1 is an overall view of the D486.

FIGURE 1   D486 CPU.
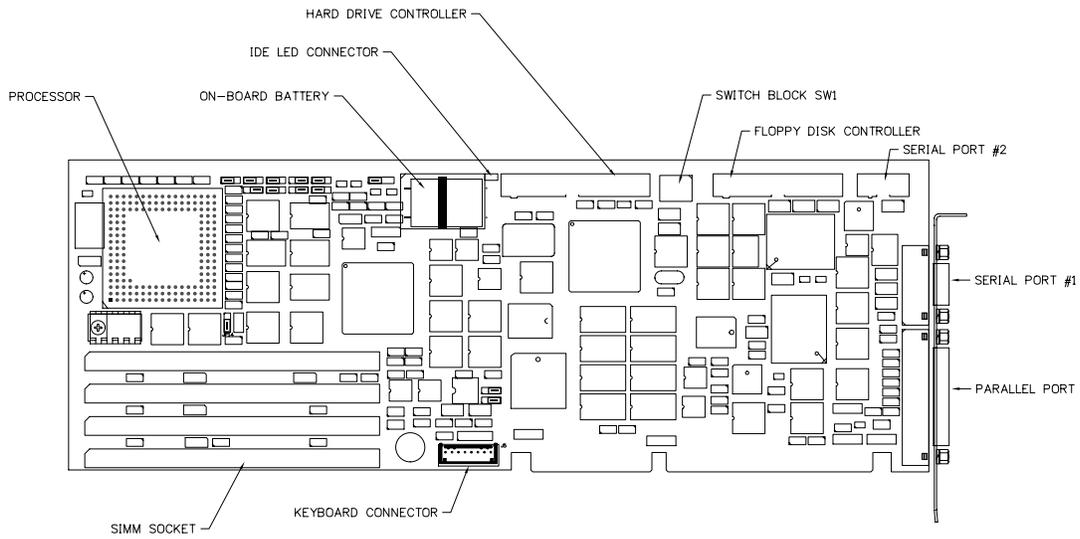
FRONT VIEW

1.1 D486 Components

The D486 contains the components normally found on a plug-in CPU card: a microprocessor, "headers" and "connectors," a "dip switch" block, "jumper" blocks, "SIMM" sockets, etc. Figure 1 and other illustrations throughout the manual provide the location of these components.

The **microprocessor** is the "brain" of the D486, where basic arithmetic, logic and control functions are processed. The D486 supports a 33-50 MHz 486DX, a 50-66 MHz 486DX2, or a 100 MHz DX4 processor.

Headers (also called "header/connector") are components used to connect peripherals (via connecting cables) to the D486. For example, locate the "IDE Hard Drive" header on the D486 (see Figure 1). This header serves as a hard drive controller; you would use an appropriate cable to connect an IDE hard drive to this header. Other headers located on the D486 include:

- a floppy drive header
- a serial port header (also called "UART 2") used to connect serial devices to the D486
- a keyboard header

Connectors are also used to connect external components to the D486, but, unlike headers, connectors are located on the I/O bracket at the end of the D486 board (which will make them accessible when you install the board, as we will discuss later). These include a serial port connector ("UART 1") and a parallel port connector.

The D486 **dip switch block**, known as SW1, is located at the top of the board. It contains four (4) small dip switches, each of which controls a different function. These switches are discussed in detail in Section 1.2.1.

Jumper blocks are small electronic components that contain pins, or small electronic leads, some of which are connected via jumpers (or "shunts"), small conductors used to divert electrical current. These jumper blocks have certain functions, depending on their configuration. We'll also discuss jumper blocks in Section 1.2.2.

SIMM (**S**ingle **I**nline **M**emory **M**odule) sockets are located on the left side of the D486 Board. SIMM's are "sticks" of DRAM (**D**ynamic **R**andom **A**ccess **M**emory) that can be inserted into these sockets, providing extra memory. SIMM's are discussed in Chapter 6.

1.2   Before You Install the D486

Now that you're familiar with some key D486 components, let's discuss those components you'll need to check before you install your D486.

First, it is important to protect yourself and your equipment before you perform any of the following procedures. **Never touch the D486 while it is installed in the chassis and power is ON.** You should check the D486 configuration before you install the board. However, if the D486 is already installed in your system, remove power by turning all power switches OFF and disconnecting all power cords from their power sources. Follow all safety precautions outlined by the chassis manufacturer. *Only qualified, experienced electronics personnel should access the unit's interior.*

Also, **do not touch the D486 unless you are wearing a static-dissipative device such as the grounding wrist strap provided with your D486 CPU.** Static electricity can damage sensitive D486 components.

Before you install the D486, check the dip switch and jumper settings outlined in Sections 1.2.1 and 1.2.2. Pay particular attention to the dip switch settings; the jumpers are preconfigured at the factory and are appropriate for most applications. Memory SIMM's are also installed at the factory.

1.2.1   Checking the Dip Switch Settings

Locate Switch Block SW1, the four-switch block positioned at the top of the D486 board. Note that these switches are numbered, from right to left, one (1) through four (4). Thus, the switch on the far right side of the block is SW1, position 1, or SW1-1.
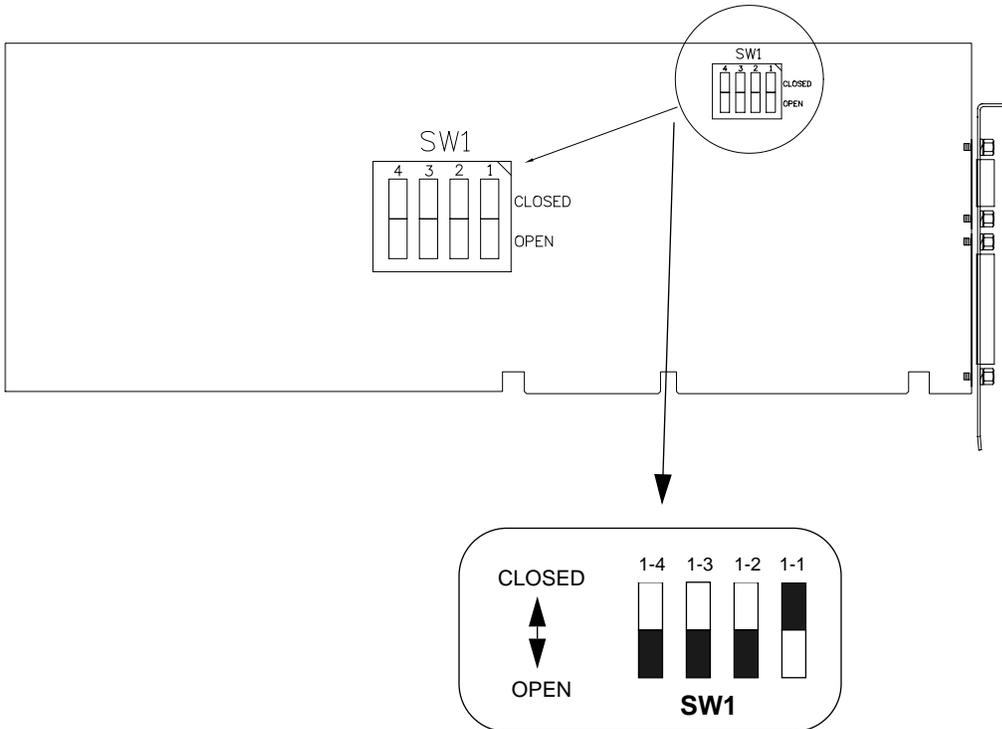
SW1-1 is used to set the default monitor type. When SW1-1 is CLOSED, the D486 is configured to run with a **color** monitor. When it is OPEN, SW1-1 is set to the **monochrome** monitor position. **The D486 is shipped with this switch CLOSED**. If you're using a color monitor, be sure that SW1-1 is CLOSED. If you're using a monochrome monitor, OPEN this switch (of course, make sure that no power is being fed to the D486 before you touch the switch).

SW1-2 controls the on-board ROM access. If you OPEN this switch, the Flash memory (special memory described in Appendix A at the back of this manual) is enabled and the auxiliary ROM is disabled. If this switch is CLOSED, the auxiliary ROM is enabled, and the Flash memory is disabled. T**he D486 is shipped with this switch OPEN.**

SW1-3 is used in special cases when the CMOS RAM (Complementary Metallic Oxide Semiconductor Random Access Memory) becomes corrupted. This condition is usually accompanied by a "lock-up" of the system. The factory default values for D486 operation must then be reloaded into CMOS RAM. **Under normal conditions, SW1-3 should remain in the OPEN position.** However, when factory default values must be reloaded, see Chapter 5.3 for proper procedures.

SW1-4 is used to configure the on-board I/O port:

- SW1-4 closed: I/O address is 370h
- SW1-4 open: I/O address is 270h

The default setting is 270h.

1.2.2   Checking the Jumper Block Settings

As discussed earlier, jumper blocks are small components contain-ing electronic leads (called pins) sometimes connected by jumpers (small conductors). These blocks have specific functions that are affected by the presence and position of a jumper within the block. Locations of these blocks are shown in the figure below.
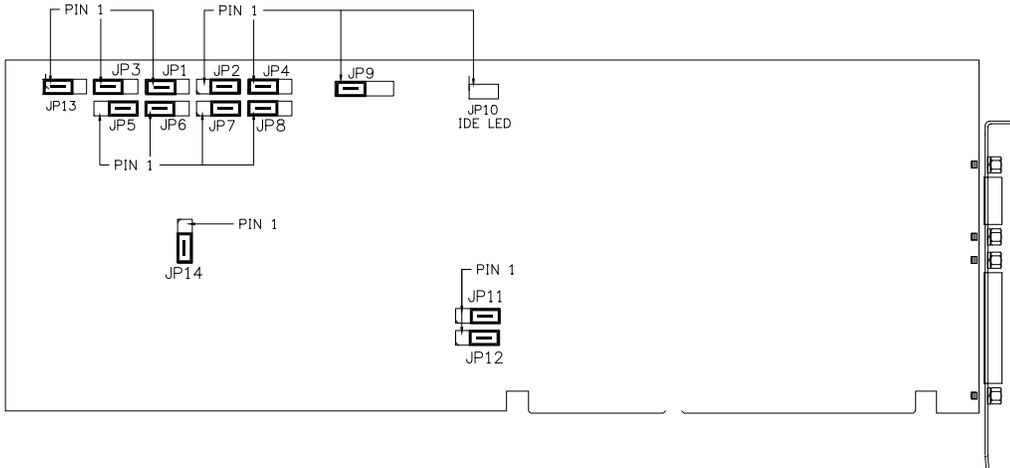
The following paragraphs provide more information about these jumper blocks. If, after reading the descriptions, you want to change the default jumper settings, do so with caution. **Only experienced electronics personnel should attempt to change these jumper settings. Make sure that no power is being fed to the D486 and that you are wearing a grounding wrist strap or other static-dissipative device.** If you have questions, call Texas Micro's Technical Support Department (see page 3).

Jumper Blocks JP1, JP2, JP3, and JP14 are three-pin blocks that determine the installed processor type. The following table provides options and configuration settings for these blocks.

This configuration...	...determines this processor type
JP1 - Pin 1 jumpered to Pin 2 JP2 - Pin 2 jumpered to Pin 3 JP3 - Pin 1 jumpered to Pin 2 JP14 - PIn 1 jumpered to Pin 2	DX4
JP1 - Pin 1 jumpered to Pin 2 JP2 - Pin 2 jumpered to Pin 3 JP3 - Pin 1 jumpered to Pin 2 JP14 - PIn 2 jumpered to Pin 3	486DX, 486DX2

Jumper Block JP4 is a three-pin block that allows you to configure the system for compatibility with your processor's speed. If you connect Pins 1 and 2 with a jumper, your system will run a 33-100MHz DX, DX2 or DX4 processor (this is the default setting and should not be changed).

Jumper Blocks JP5, **JP6, JP7 and JP8** are three-pin blocks that determine the cache size configuration. The following chart provides options and configuration settings for these blocks.

This configuration...	...determines this cache size
JP5 - Pin 1 jumpered to Pin 2 JP6 - Pin 1 jumpered to Pin 2 JP7 - Pin 1 jumpered to Pin 2 JP8 - No jumper	64 KByte cache
JP5 - Pin 2 jumpered to Pin 3 JP6 - Pin 1 jumpered to Pin 2 JP7 - Pin 2 jumpered to Pin 3 JP8 - Pin 1 jumpered to Pin 2	128 KByte cache (default)
JP5 - Pin 2 jumpered to Pin 3 JP6 - Pin 2 jumpered to Pin 3 JP7 - Pin 1 jumpered to Pin 2 JP8 - Pin 2 jumpered to Pin 3	256 KByte cache

Jumper Block JP9, a four-pin single-row block, allows you to select the type of backup battery source employed by the D486. By connecting Pin 1 to Pin 2 via a jumper, you select the D486 on-board battery, which is capable of saving CMOS RAM contents and maintaining time of day for approximately 100,000 hours. If you choose to provide a separate battery, remove the jumper between Pins 1 and 2 (remember to remove all power and use a grounding device). **The factory default is Pin 1 jumpered to Pin 2, on-board battery enabled.**

Note: Battery voltage should be between 3.0 and 3.5 volts, with a 7.5 uA current drain at 3.5 volts.

Jumper Block JP10 is a two-pin header that provides output for connecting a light-emitting diode (LED) to indicate hard drive activity. Pin 1 of this jumper is the anode (the positive electrode); Pin 2 is the cathode.

Jumper Block JP11 is a three-pin strip used to determine if the watchdog timer will be enabled or disabled. If Pin 1 is connected to Pin 2, the watchdog timer will reset the system in the absence of 80486 CPU activity. If Pin 2 is connected to Pin 3, the watchdog timer is disabled. **The factory default for this block is Pin 2 jumpered to Pin 3.**

Jumper Block JP12 is a three-pin strip used to select the system reset delay period upon a watchdog time out. With Pin 1 connected to Pin 2, the delay is 1.2 seconds. If Pin 2 is connected to Pin 3, the delay is 150 msec. When no pins are connected, the delay is 600 msec. **The factory default is Pin 2 connected to Pin 3, 150 msec delay.**

Jumper Block JP13 is a three-pin strip used as a DX4 clock multiplier. If Pin 2 is connected to Pin 3, the DX4 processor will run at twice the oscillator frequency. If Pin 1 is connected to Pin 2, the DX4 processor will run at three times the oscillator frequency.

Remember, only experienced electronics personnel should attempt to change jumper settings. Make sure that no power is being fed to the D486 and that you are wearing a grounding wrist strap. If you have any questions, please contact our Technical Support department (see page 3).

CHAPTER 2　　　D486 Installation

Once you have checked all switches and jumper blocks to ensure they match the desired configuration, you're ready to install the D486 into an AT-compatible chassis backplane. However, before installing the D486 Card, consult the documentation provided with the chassis. Installation instructions should be followed precisely.

CAUTION: Always remove power from the system before installing the D486. Follow all power-down procedures outlined in the chassis' user's manual. To ensure no injury occurs, disconnect the power cord from the power source. Only qualified, experienced electronics personnel should access the interior of a chassis.

CAUTION: The components of the D486 Card are very sensitive to static discharge. Therefore, Texas Micro provides a grounding wrist strap to help remove all static electricity before touching the components. While out of the unit, D486 components should be placed on a static-dissipative surface or into a static-shielding bag.

The procedure for installing the D486 into a Texas Micro chassis is described below.

1. Remove power from the chassis and disconnect all power cords. Follow all power-down procedures outlined in your chassis' user's guide.

2. Remove the chassis cover, then detach the circuit card hold-down bracket. This bracket stretches across the tops of the circuit cards and holds them in place.

3. Locate the desired bus location for installation (user's choice, although it is suggested that a location providing maximum distance between boards is chosen to allow proper ventilation).

4. Remove the I/O bracket spacer from the rear of the chassis. This spacer occupies the area where the card's I/O bracket is accessed through the back of the chassis.

5. Attach the internal system keyboard connector cable to the D486 keyboard connector (see Section 3.3).

6. Place the board ends into the appropriate card guide and card-end slot in the chassis. Lower the D486 into position and carefully push the card-edge connector into the slot. Ensure that the I/O bracket is accessible through the back of the chassis.

7. Secure the card-edge I/O bracket to the hold-down lip.

8. Attach any required cables.

9. After installing the D486 and any other add-in cards desired, secure all PC boards by appropriately positioning the card hold-down bracket and securing it into place with the hardware provided for this purpose.

10. To install the D486 into a passive backplane not manufactured by Texas Micro, follow the instructions provided in this manual and the installation information provided by the backplane manufacturer.

CHAPTER 3   # Connecting Peripherals

The D486 provides several headers/connectors for attaching peripheral devices to the board:

- Two (2) serial ports
- One (1) parallel port
- A keyboard interface header/connector
- An IDE hard drive header/connector
- A floppy drive header/connector

This chapter supplies information and locations for each of these components. Pinouts of each connector are also included. A **pinout** identifies the function of each pin of a connector. Please note that, while this information is valuable to electronics personnel, it is not crucial to the everyday operation of the D486. As long as the proper cable is used and the connecting plug is properly inserted, a supported peripheral should be operable when used with the D486.

Please note the following cautions when connecting peripherals to the D486 CPU.

CAUTION: *Always remove power from the system before connecting peripherals to the D486. To ensure no personal injury occurs, disconnect the power cord from the power source.* **Only qualified, experienced electronics personnel should access the interior of a chassis.**

CAUTION: *The components of the D486 Card are very sensitive to static discharge. Therefore, Texas Micro provides a grounding wrist strap to help remove all static electricity before touching the components. While out of the unit, D486 components should be placed on a static-dissipative surface or into a static-shielding bag.*

3.1 Serial Ports

Let's begin with the two serial ports. Serial ports allow you to connect serial devices (a serial mouse, serial printers, etc.) to the D486 via appropriate serial cables. Serial ports are also known as COM ports or UART (Universal Asynchronous Receiver/Transmitter) ports. *Note: These are 16450 UART's.*

Note that one serial port (UART 1), labeled "J4" in Figure 1, is located on the edge of the card (on the I/O bracket). This means that you can access UART 1 through the back of the chassis after the D486 is installed.

Note that one serial port (UART 2), labeled "J3," is located on the card's front surface (see Figure 2). If you've already installed your D486, you must remove the chassis cover to access this port. Consult your chassis documentation for procedures on removing the chassis cover, **but remember to remove power from the system and unplug the power cord before you access the interior of the chassis. Most importantly, only qualified, experienced electronics personnel should access the interior of a chassis.**

Be sure to use the proper cable when connecting a serial device to the D486 (9-pin DB9 interface connector - Part No. SCF1). More information about serial ports can be found in Section 5.2.1.

The graphic at the bottom of Figure 2 describes the proper pin assignments when wiring a 25-pin connector to a 9-pin connector. If you have any questions about this procedure, call Texas Micro (see page 3 for details).

FIGURE 2

Pin	Description
1	DCD (Data Carrier Detect)
2	RXD (Receive Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	GND (Signal Ground)
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear to Send)
9	RI (Ring Indicator)
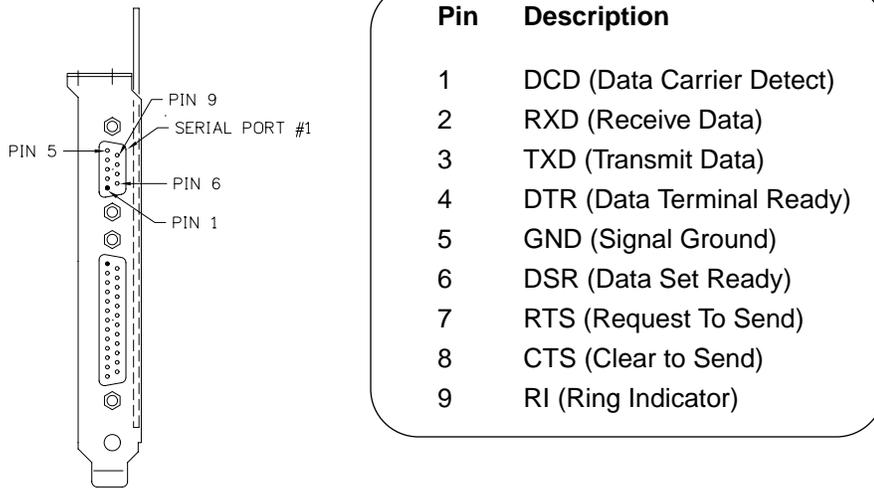
To wire a 25-pin connector to a 9-pin connector, use the following table.

DB9 Pin	DB25 Pin	Description
1	8	DCD (Data Carrier Detect)
2	3	RXD (Receive Data)
3	2	TXD (Transmit Data)
4	20	DTR (Data Terminal Ready)
5	7	GND (Signal Ground)
6	6	DSR (Data Set Ready)
7	4	RTS (Request To Send)
8	5	CTS (Clear to Send)
9	22	RI (Ring Indicator)

FIGURE 3

PIN 2

PIN 10

SERIAL 2   J3

HEADER 5X

PIN 1

PIN 9
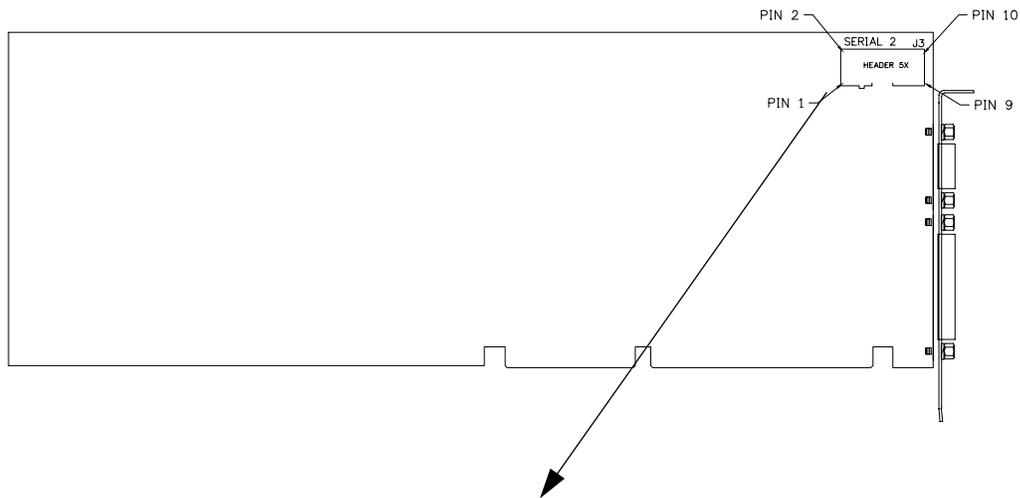
Pin	Description
1	DCD (Data Carrier Detect)
2	DSR (Data Set Ready)
3	RX (Receive Data)
4	RTS (Request To Send)
5	TX (Transmit Data)
6	CTS (Clear To Send)
7	DTR (Data Terminal Ready)
8	RI (Ring Indicator)
9	GND (Signal Ground)
10	VCC +5 (Not Connected)

3.2 Parallel Port

The parallel port (Connector J6) is normally used for connecting a printer to the D486. This port is a 25-pin connector located on the right edge of the D486 (see Figure 4). Connect the printer cable to this port for printer operation (of course, only <u>after</u> removing system power and disconnecting the power cord).

More information on parallel ports and their configuration can be found in Section 5.2.2.

FIGURE 4
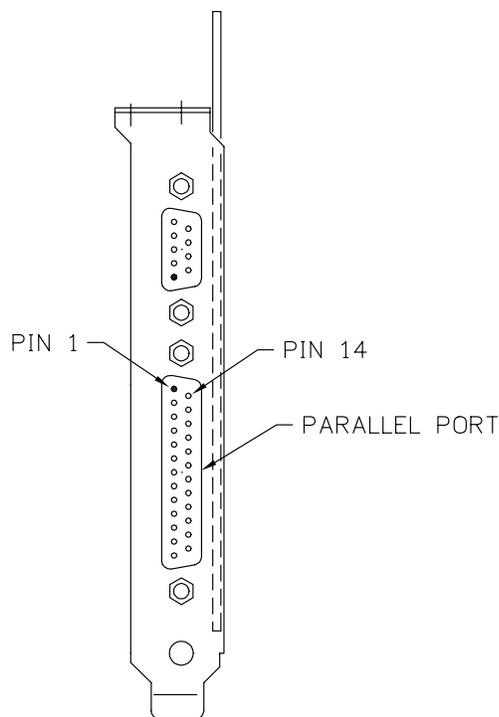
Pin Number	Description
1	-Strobe
2	+ Data Bit 0
3	+ Data Bit 1
4	+ Data Bit 2
5	+ Data Bit 3
6	+ Data Bit 4
7	+ Data Bit 5
8	+ Data Bit 6
9	+ Data Bit 7
10	- Acknowledge
11	+ Busy
12	+ Paper End
13	+ Select
14	- Auto Feed
15	- Error
16	- Init. Printer
17	- Select Input
18-25	Ground

PIN 1

PIN 14

PARALLEL PORT

3.3 Keyboard Cable Header/Connector

The D486 provides a keyboard cable header/connector at the bottom edge of the card. This is an 8-pin header located at J5. See Figure 5 for the location and pinout of this header.

Note that some connector manufacturers use "reverse" pin numbers. For the D486, Pin 1 is on the left edge of the keyboard connector (when viewing the chip side of the board with the I/O bracket on the right).

The sockets on the Texas Micro keyboard connector cable are numbered in reverse order when compared to the pinout of the D486 keyboard cable connector. For example, Socket 8 of the connector cable corresponds with Pin 1 of the D486 keyboard cable connector, Socket 7 of the cable corresponds with Pin 2 of the connector, etc. Figure 5 provides proper connector procedures for the keyboard interface cable. Ensure that the pins on the keyboard connector correspond with the pins on the cable connector.

FIGURE 5   Keyboard connector.
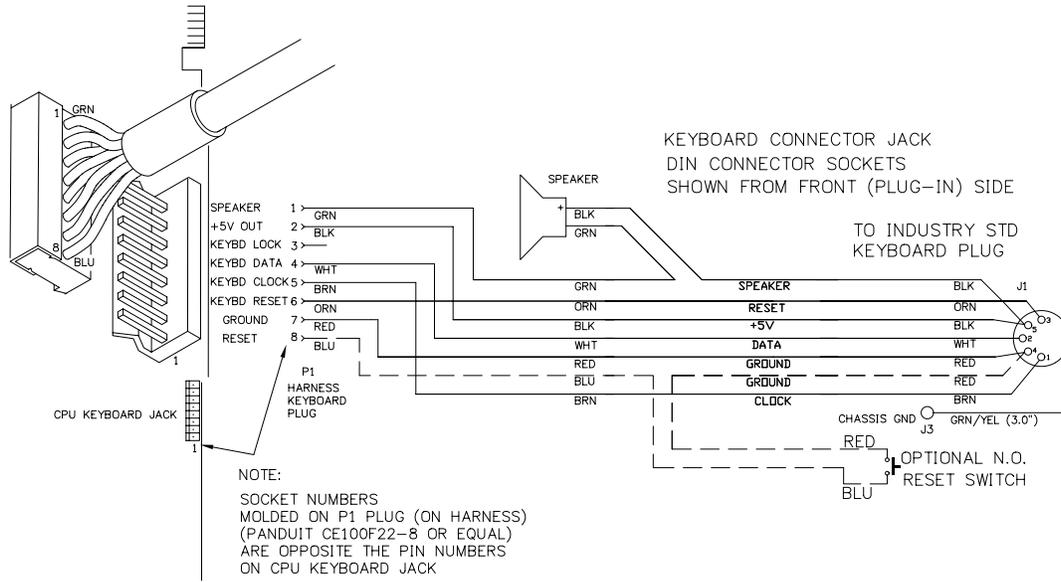
3.4 Hard Drive Header/Connector

Two (2) Integrated Device Electronics (IDE) hard disk drives can be attached to the D486 board via J1 and a 40-conductor cable of a maximum length of two (2) feet. The pinout of J2, a 40-pin connector, is provided in Figure 6.

Note: The "red stripe" on the 40-pin cable should be near Pins 1 and 2 on the 40-pin connector. The IDE hard drive(s) will not work correctly if the cable is plugged in backwards.

If the D486 has been installed, accessing this header requires removal of the chassis cover. Consult your chassis documentation for procedures on removing the chassis cover, **but remember to remove power from the system and unplug the power cord before you access the interior of the chassis. Only qualified, experienced electronics personnel should access the interior of a chassis.**

FIGURE 6
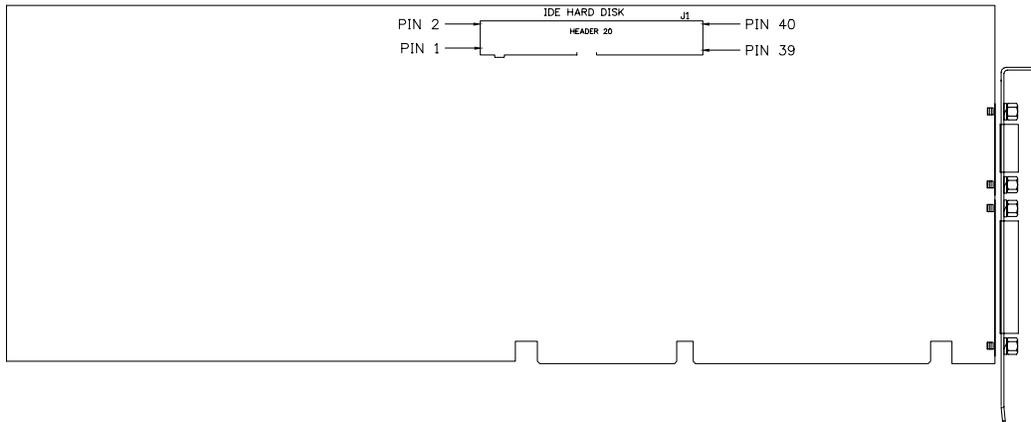
Pin Number	Description	Pin Number	Description
1	Reset, output	2	Ground
3	+ Data 7, input/output	4	+ Data 8, input/output
5	+ Data 6, input/output	6	+ Data 9, input/output
7	+ Data 5, input/output	8	+ Data 10, input/output
9	+ Data 4, input/output	10	+ Data 11, input/output
11	+ Data 3, input/output	12	+ Data 12, input/output
13	+ Data 2, input/output	14	+ Data 13, input/output
15	+ Data 1, input/output	16	+ Data 14, input/output
17	+ Data 0, input/output	18	+ Data 15, input/output
19	Ground	20	No connection
21	No connection	22	Ground
23	-I/O Write, output	24	Ground
25	-I/O Read, output	26	Ground
27	No connection	28	+ALE, output
29	No connection	30	Ground
31	+IRQ14, input	32	I/O CS16, output
33	+ADDR1, output	34	No connection
35	+ADDR0, output	36	+ADDR2, output
37	-CS0, output	38	CS1, output
39	Activity Light, output	40	Ground

3.5 Floppy Drive Header/Connector

Two floppy disk drives can be attached to the D486 at J2 with a 34-conductor flat cable no more than three (3) feet in length. Two connectors are spaced the desired distance at the drive end of the cable, with Conductors 10 through 16 separated from the remainder of the cable and twisted 180° between the two drive connectors.

Note: The "red stripe" on the 40-pin cable should be near Pins 1 and 2 on the 40-pin connector. The floppy drive(s) will not work correctly if the cable is plugged in backwards.

The two installed drives may be any combination of 360 KByte and 1.2 MByte 5.25" drives or 720 KByte and 1.44 MByte 3.5" drives. Both drives should be jumper-configured as Drive 1. DOS controls the floppy disk drives; therefore, consult the DOS manual for detailed information on disk operations. Consult Figure 7 for the J4 pinout.

If the D486 has been installed, accessing this header requires removal of the chassis cover. Consult your chassis documentation for procedures on removing the chassis cover, **but remember to remove power from the system and unplug the power cord before you access the interior of the chassis. Only qualified, experienced electronics personnel should access the interior of a chassis.**

FIGURE 7
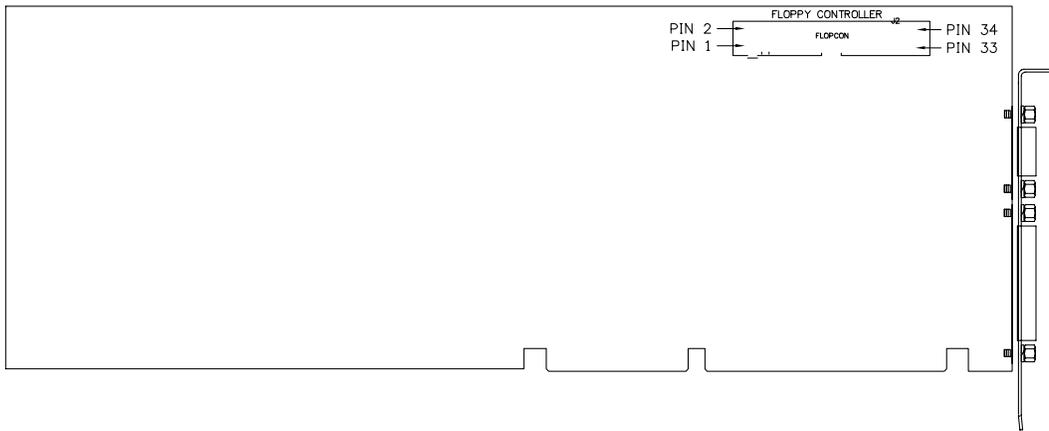
Pin	Description	Pin	Description
1	Ground	2	Disk speed change, output
3	Ground	4	No connection
5	Ground	6	No connection
7	Ground	8	Index detect, input, active low
9	Ground	10	Motor enable Drive A, output, active low
11	Ground	12	Select Drive B, output, active low
13	Ground	14	Select Drive A, output, active low
15	Ground	16	Motor enable Drive B, output, active low
17	Ground	18	Head step pulse, output, active low
19	Ground	20	Head step pulse, output, active low
21	Ground	22	Write data, output, active low
23	Ground	24	Write gate, output active low
25	Ground	26	Track 0 detect, input, active low
27	Ground	28	Write protect sense, input, active low
29	Ground	30	Read data, input, active high
31	Ground	32	Head select, output
33	Ground	34	Diskette change detect, input, active low

CHAPTER 4   Power-up

After all jumpers and switches have been checked, the D486 has been installed and all desired peripheral devices have been connected to the board, the D486 is ready for power-up.

To power-up the D486, simply connect all required power cables and turn the system on. Consult your chassis documentation for more information on power cable connection. However, before you power-up your system, ensure that the operating system you will be using is available on either Drive C or a diskette in Drive A.

4.1 BIOS

When you power the system up, the D486 BIOS (Basic Input Output System) will perform checks and diagnostics, then search for an operating system. The BIOS will not search for an operating system on drives other than C or A. Also, if a diskette that does not contain the operating system is engaged in Drive A, an error message will be displayed. Remove the diskette and strike any key to "boot" (restart) the system.

4.2 Diagnostics

Upon power-up, the BIOS performs initialization routines, calculating memory size and configuration data to load into CMOS (Complimentary Metallic Oxide Semiconductor) memory. The BIOS then performs internal diagnostics to compare the D486's current physical configuration with the configuration information recorded in CMOS memory during setup. If inconsistencies exist, BIOS error messages are displayed.

Some errors noted during power-up may be quickly corrected by verifying the setup information (see Chapter 5). Errors of greater complexity or a more technical nature may require the aid of trained technical personnel. Contact Texas Micro's Technical Support Department for assistance (see page 3). Upon completion of the power-on diagnostics tests, the D486 loads the operating system from disk or other mass-storage device. However, if CMOS RAM contents are incorrect, the D486 will prompt you to invoke the Setup Utility (see Chapter 5).

4.3 Rebooting the D486

If you wish to reboot the D486, three (3) methods are acceptable:

1. Cycle power off and on.
2. Press and hold the CTRL, ALT and DEL keys.
3. Depress the system's reset switch.

Using any of these methods to reboot the D486 will result in system memory data loss. Therefore, it is suggested that, where possible, all processing be completed before reboot.

Next, you need to check all the configuration settings for the board before you begin using it. Turn to Chapter 5 for information on the D486 Setup Utility.

QuickStart for
Advanced Users

This segment of the manual provides a "quickstart" feature for advanced computer users. Included are procedures for:

- checking dip switch default settings
- checking jumper block default settings
- installing the D486
- connecting peripherals to the D486
- powering the system up
- accessing the Setup Utility

To configure the D486 Board, perform the following:

1. Check dip switch settings.

   Locate Switch Block SW1. The following are default settings.

   - SW1-1 CLOSED - color monitor
   - SW1-2 OPEN - flash ROM access
   - SW1-3 OPEN - board uses setup configuration you provide through the Setup Utility (see Chapter 5)
   - SW1-4 OPEN - I/O address is 270h

2. Check jumper defaults.

Locate the D486 jumper blocks. The defaults for these blocks are as follows:

JP1, JP2, JP3, JP13, JP14 - 486DX or 486DX2 processor installed.

> JP1 - Pins 1 and 2 connected
> JP2 - Pins 2 and 3 connected
> JP3 - Pins 1 and 2 connected
> JP13 - Pins 1 and 2 connected
> JP14 - Pins 2 and 3 connected

JP4 - 33-66 MHz DX or DX2 operation - Pins 1 and 2 connected.

JP5, JP6, JP7 and JP8 - 128 KByte cache operation.

> JP5 - Pins 2 and 3 connected
> JP6 - Pins 1 and 2 connected
> JP7 - Pins 2 and 3 connected
> JP8 - Pins 1 and 2 connected

JP9 - On-board battery enabled - Pins 1 and 2 connected.

JP11 - Watchdog timer responds to clock - Pins 2 and 3 connected.

JP12 - 150 msec reset delay - Pins 2 and 3 connected.

3. Install the D486.

    To install the D486:

    - Remove power from the system by turning all power switches OFF and disconnecting the power cord from the power source. Only qualified, experienced electronics personnel should access the interior of a chassis.
    - Remove static electricity by wearing a static-dissipative device (such as a grounding wrist strap). Place the board on static-dissipative surfaces ONLY.
    - Remove the I/O bracket spacer from the rear of the chassis.
    - Connect the internal keyboard cable to the D486 keyboard connector (see Section 3.3).
    - Carefully lower and push the board into a card slot. Ensure that the I/O bracket is accessible through the back of the chassis.
    - Secure the card-edge I/O bracket to the hold-down lip.
    - Connect any additional cables.

4. Connect peripherals to the D486.

    Before you connect any peripherals to the D486, make sure that no power is being applied to the D486 Board and the peripherals.

    CAUTION: Always remove power from the system and peripherals before connecting the peripherals. To ensure no injury occurs, disconnect all power cords from their power sources. Only qualified, experienced electronics personnel should access the interior of a chassis.

    CAUTION: The components of the D486 Card are very sensitive to static discharge. Therefore, Texas Micro provides a grounding wrist strap to help remove all static electricity before touching the components. While out of the unit, the components should be placed on a static-dissipative surface or into a static-shielding bag.

    Consult Chapter 3 for connector locations and pinouts.

5. Power the system up.

The BIOS will perform power-on checks, operate diagnostics and invoke the internal setup routine. It will then direct the media device to search for and load the operating system.

During the memory test, press <S> to enter the on-board Setup Utility. After the memory test, the Setup Utility will be displayed. Verify the settings in the Setup Utility to configure your board properly. Turn to Chapter 5 for procedures. After completing this step, you can begin using your system.

CHAPTER 5

Using the Setup Utility

After all switches and jumpers have been checked, the D486 has been installed, peripherals have been connected and power has been turned on, you are ready to access the D486 Setup Utility.

The D486 Setup Utility is a special set of commands residing in EPROM and used to set the computer time, date and configuration data. The Setup Utility can be accessed in two (2) ways:

- By pressing <S> during memory tests, or
- By pressing F2 when prompted by the BIOS during the power-up operation. This occurs if the BIOS encounters errors when trying to use the Setup Utility information (if desired, the user may press the F1 key to instruct the BIOS to continue its diagnostics checks and attempt to load the operating system).

The D486 Setup Utility begins by displaying the screen pictured in Figure 8. This screen is comprised of three (3) components:

- Options Menu
- Summary information
- Hot key descriptions

The Options Menu is located on the left side of the screen. This menu contains a list of system parameters you can modify to meet your system requirements. Use the UP/DOWN ARROW keys to move the cursor up and down the list. When the cursor is on the desired item, press the <ENTER> key to modify settings for that specific topic.

The "summary information" area displays current system settings and is located to the right of the Options Menu.

"Hot key" descriptions appear at the bottom of the screen. Press any of these keys to perform its assigned function.

FIGURE 8

```
              Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                    Model D486 100 MHz              BIOS Version 4.0.1.0

    ┌─── Basic Options ───┐      Time ............................................. 10:18:28
    │  ┌───────────────┐  │      Date.............................................. Aug 30, 1993
    │  │               │  │      Weekday......................................... Monday
    │  │ Time and Date │  │
    │  │ Floppy Disks  │  │      Drive A............................................ 3 ¹/₂ Inch, 1.44 MB
    │  │ Fixed Disks   │  │      Drive B............................................ Not Installed
    │  │ Video Adapter │  │      Hard Disk 1...................................... Type 2 is 20 MB
    │  │ Keyboard      │  │      Hard Disk 2...................................... Not Installed
    │  │ Shadow RAM    │  │      Video Adapter................................. VGA/EGA
    │  │ Boot Options  │  │
    │  │ Password Options│ │      Base Memory .................................. 640K
    │  │ Password Edit │  │      Extended Memory ........................... 3072K
    │  │ Advanced Options│ │      Floating Point Unit .......................... Operational
    │  │ Park Hard Drive│ │      Fast Boot ........................................ No
    │  │ Flash It!     │  │      Boot Drive Sequence ...................... Drive A: then C:
    │  │               │  │      101-Keyboard NumLock................. Off'
    │  └───────────────┘  │      Password Protection........................ None
    └─────────────────────┘      Boot Errors:  Keyboard:................... On
                                               Floppy: ...................... On
                                               Video:......................... On


    ↑ (previous)    ↓ (next)      F5 (color on/off)    Esc (save/reboot)    Enter (execute)
```

5.1 Basic Options Menu

Locate the "Basic Options" menu. This list outlines all the parameters you can change through the Setup Utility. This menu is pictured below.

```
            Basic Options

     Time and Date
     Floppy Disks
     Fixed Disks
     Video Adapter
     Keyboard
     Shadow RAM
     Boot Options
     Password Options
     Password Edit
     Advanced Options
     Park Hard Drive
     Flash It!
```

Note the "Advanced Options" item. Choosing this item will cause a new menu of options to be displayed. We'll discuss this menu later in this manual. For now, let's concentrate on each of the Basic Options menu items. Remember, use the UP/DOWN ARROW keys to highlight an item, then the <ENTER> key to select that item.

5.1.1 Time and Date

This option allows you to set the time and date in the battery-backed clock/calendar, which is used to set the DOS time and date before the operating system is loaded.

FIGURE 9

```
    Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
           Model D486 100 MHz                 BIOS Version 4.0.1.0


      ┌─── Basic Options ───┐     Time ................................................. 10:18:28
      │                     │     Date................................................. Aug 30, 1993
      │  Time and Date      │     Weekday......................................... Monday
      │  Floppy Disks       │     ┌──────── Set Time and Date ────────┐
      │  Fixed Disks        │                                          44 MB
      │  Video Adapter      │        Time:        09:43:02
      │  Keyboard           │                                          ed
      │  Shadow RAM         │        Date:        Aug 30, 1993
      │  Boot Options       │
      │  Password Options   │        Weekday:     Monday
      │  Password Edit      │
      │  Advanced Options   │     └──────────────────────────────────┘
      │  Park Hard Drive    │     Floating Point Unit ........................... Not Present
      │  Flash It!          │     Fast Boot ........................................ No
      │                     │     Boot Drive Sequence ...................... Drive A: then C:
      └─────────────────────┘     101-Keyboard NumLock.................. Off'
                                  Password Protection........................ None
                                  Boot Errors:  Keyboard:................... On
                                                Floppy: ...................... On
                                                Video:......................... On


       ↑(previous)        ↓ (next)         Spacebar (change)    Enter (execute)
```

5.1.2 Floppy Disks

This feature allows you to configure the floppy drive subsystem. The first menu asks if you want to enable the D486 on-board controller. In addition, the Setup Utility will request the drive types for floppy drives A: and B:. Finally, you will be asked if you want to enable or disable floppy drive configuration errors. If disabled, this option directs the system to ignore errors it detects in the floppy disk configuration during power-up operation.

FIGURE 10 - A

```
          Texas Microsystems, Inc. Setup Utility     Copyright (c) 1988-1994
                 Model D486 100 MHz                  BIOS Version 4.0.1.0


   ┌─── Basic Options ───┐      Time ................................. 10:18:28
   │                     │      Date................................. Aug 30, 1993
   │                     │      Weekday........................... Monday
   │  Time and Date      │    ┌──── Onboard Floppy Controller ────┐
   │  Floppy Disks       │    │                              44 MB
   │  Fixed Disks        │    │           Off                     │
   │  Video Adapter      │    │           On                   d  │
   │  Keyboard           │    │                                   │
   │  Shadow RAM         │    └───────────────────────────────────┘
   │  Boot Options       │      Video Adapter.......................... VGA/EGA
   │  Password Options   │
   │  Password Edit      │      Base Memory ................................. 640K
   │  Advanced Options   │      Extended Memory ........................... 3072K
   │  Park Hard Drive    │      Floating Point Unit ........................... Not Present
   │  Flash It!          │      Fast Boot ........................................ No
   │                     │      Boot Drive Sequence ...................... Drive A: then C:
   └─────────────────────┘      101-Keyboard NumLock.................. Off‘
                                Password Protection........................ None
                                Boot Errors:  Keyboard:................... On
                                                Floppy: ....................... On
                                                Video:......................... On


      ↑(Previous)          ↓ (Next)          Esc (quit/save)          Enter (execute)
```

FIGURE 10 - B

```
     Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
             Model D486 100 MHz              BIOS Version 4.0.1.0


   ┌── Basic Options ──┐       Time ................................................ 10:18:28
   │                   │       Date................................................ Aug 30, 1993
   │                   │       Weekday........................................ Monday
   │  Time and Date    │       ┌─── Select Drive A: Type ───┐
   │  Floppy Disks     │                                       44 MB
   │  Fixed Disks      │          Not Installed
   │  Video Adapter    │          5 1/4 Inch, 360 KB            ed
   │  Keyboard         │          5 1/4 Inch, 1.2 MB
   │  Shadow RAM       │          3 1/2 Inch, 720 KB
   │  Boot Options     │          3 1/2 Inch, 1.44 MB
   │  Password Options │       └─────────────────────────────┘
   │  Password Edit    │       Extended Memory ........................... 3072K
   │  Advanced Options │       Floating Point Unit ........................... Not Present
   │  Park Hard Drive  │       Fast Boot ....................................... No
   │  Flash It!        │       Boot Drive Sequence ..................... Drive A: then C:
   │                   │       101-Keyboard NumLock.................. Off'
   └───────────────────┘       Password Protection....................... None
                               Boot Errors:  Keyboard:.................. On
                                             Floppy: ...................... On
                                             Video:........................ On


     ↑(Previous)          ↓ (Next)          Esc (quit/save)        Enter (execute)
```

FIGURE 10 - C

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│       Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994│
│              Model D486 100 MHz              BIOS Version 4.0.1.0      │
│                                                                       │
│                                                                       │
│        ┌─ Basic Options ─┐    Time ..............................10:18:28│
│        │                 │    Date ..............................Aug 30, 1993│
│        │                 │    Weekday ........................Monday   │
│        │ Time and Date   │    ┌──── Select Drive B: Type ────┐        │
│        │ Floppy Disks    │                                   44 MB     │
│        │ Fixed Disks     │      Not Installed                         │
│        │ Video Adapter   │      5 1/4 Inch, 360 KB                    │
│        │ Keyboard        │      5 1/4 Inch, 1.2 MB            ed       │
│        │ Shadow RAM      │      3 1/2 Inch, 720 KB                    │
│        │ Boot Options    │      3 1/2 Inch, 1.44 MB                   │
│        │ Password Options│    └──────────────────────────────┘        │
│        │ Password Edit   │    Extended Memory...........................3072K│
│        │ Advanced Options│    Floating Point Unit...........................Not Present│
│        │ Park Hard Drive │    Fast Boot.........................................No│
│        │ Flash It!       │    Boot Drive Sequence .......................Drive A: then C:│
│        │                 │    101-Keyboard NumLock...................Off'│
│        └─────────────────┘    Password Protection ........................None│
│                               Boot Errors:  Keyboard: ...................On│
│                                            Floppy:........................On│
│                                            Video: ........................On│
│                                                                       │
│                                                                       │
│   ↑(Previous)        ↓ (Next)        Esc (quit/save)     Enter (execute)│
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

FIGURE 10 - D

```
        Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
               Model D486 100 MHz                 BIOS Version 4.0.1.0

     ┌─── Basic Options ───┐    Time ............................................. 10:18:28
     │┌───────────────────┐│    Date ............................................. Aug 30, 1993
     ││                   ││    Weekday .......................................... Monday
     ││  Time and Date    ││   ┌──── Floppy Configuration Errors ────┐
     ││  Floppy Disks     ││                                          44 MB
     ││  Fixed Disks      ││          Off
     ││  Video Adapter    ││          On
     ││  Keyboard         ││                                       ed
     ││  Shadow RAM       ││   └──────────────────────────────────────┘
     ││  Boot Options     ││    Video Adapter .............................. VGA/EGA
     ││  Password Options ││
     ││  Password Edit    ││    Base Memory ................................. 640K
     ││  Advanced Options ││    Extended Memory .......................... 3072K
     ││  Park Hard Drive  ││    Floating Point Unit ........................... Not Present
     ││  Flash It!        ││    Fast Boot ....................................... No
     ││                   ││    Boot Drive Sequence...................... Drive A: then C:
     │└───────────────────┘│    101-Keyboard NumLock ................. Off'
     └─────────────────────┘    Password Protection........................ None
                                Boot Errors:  Keyboard:.................. On
                                              Floppy: ...................... On
                                              Video:......................... On


        ↑(Previous)        ↓ (Next)        Esc (quit/save)        Enter (execute)
```

5.1.3 Fixed Disks

This option allows the user to configure the fixed (hard) disk sub-system. When you select this field, you will be asked whether you want to turn the D486 IDE controller on or off. In addition, the Setup Utility will request the drive type for hard disk 1 (drive C:) and hard disk 2 (drive D:).

An "Auto ID" feature is invoked if you press F2 while the "Hard Disk 1 Type" or "Hard Disk 2 Type" menu is displayed. This option will analyze your hard drive and provide a drive type ID, gleaned from the standard hard drive parameter table (HDPT), that most closely matches the characteristics of your hard drive.

To accept this drive type ID, press ENTER. Pressing the PgUp key will invoke a search through the HDPT for the next closest match.

If you continue to press the PgUp key, the menu will eventually display the user-configurable types "46" and "47." Types 46 and/or 47 will also be offered if no HDPT match is found when the "Auto ID" feature is invoked. These types allow you to set the hard disk configuration fields to match the particular characteristics of your hard disks.

If you want to change any of the fields offered by type 46 or 47, press ENTER to accept the values shown. Again, invoke the "Fixed Disks" option from the "Basic Options" menu, then re-enter the "Set Hard Drive" menu. You may now set the fields of this menu to the desired values.

FIGURE 11 - A

```
          Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                    Model D486 100 MHz               BIOS Version 4.0.1.0


   ┌─── Basic Options ───┐   Time ................................................10:18:28
   │                     │   Date ................................................Aug 30, 1993
   │                     │   Weekday .........................................Monday
   │  Time and Date      │   ┌─── Onboard IDE Interface ───┐  44 MB
   │  Floppy Disks       │   │                             │
   │  Fixed Disks        │   │          Off                │
   │  Video Adapter      │   │          On                 │  d
   │  Keyboard           │   │                             │
   │  Shadow RAM         │   └─────────────────────────────┘
   │  Boot Options       │   Video Adapter ...............................VGA/EGA
   │  Password Options   │
   │  Password Edit      │   Base Memory..................................640K
   │  Advanced Options   │   Extended Memory............................3072K
   │  Park Hard Drive    │   Floating Point Unit...........................Not Present
   │  Flash It!          │   Fast Boot........................................No
   │                     │   Boot Drive Sequence .......................Drive A: then C:
   └─────────────────────┘   101-Keyboard NumLock...................Off'
                             Password Protection ........................None
                             Boot Errors:  Keyboard: ...................On
                                           Floppy:.......................On
                                           Video: ........................On


     ↑(Previous)         ↓ (Next)          Esc (quit/save)         Enter (execute)
```

FIGURE 11 - B

```
        Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
               Model D486 100 MHz                BIOS Version 4.0.1.0


        ┌── Basic Options ──┐      Time ...............................................10:18:28
        │                   │      Date ...............................................Aug 30, 1993
        │                   │      Weekday .........................................Monday
        │  Time and Date    │      ┌──────── Set Hard Disk 1 Type ────────┐
        │  Floppy Disks     │      │                                      │44 MB
        │  Fixed Disks      │      │   Type.............................. 44  │
        │  Video Adapter    │      │   Cylinders .................... 820   │ d
        │  Keyboard         │      │   Heads............................. 6   │
        │  Shadow RAM       │      │   Landing Zone ............. 820   │
        │  Boot Options     │      │   Write Precomp ...............-1   │
        │  Password Options │      │   Sectors......................... 17   │
        │  Password Edit    │      │   Size ............................... 40   │
        │  Advanced Options │      │                                      │
        │  Park Hard Drive  │      └──────────────────────────────────────┘
        │  Flash It!        │      Fast Boot.........................................No
        │                   │      Boot Drive Sequence .......................Drive A: then C:
        └───────────────────┘      101-Keyboard NumLock...................Off'
                                   Password Protection ........................None
                                   Boot Errors:  Keyboard: ...................On
                                                 Floppy:........................On
                                                 Video: ........................On


        Pg Up (next)      Pg Down (previous)      F2 (Auto ID)      Enter (execute)
```
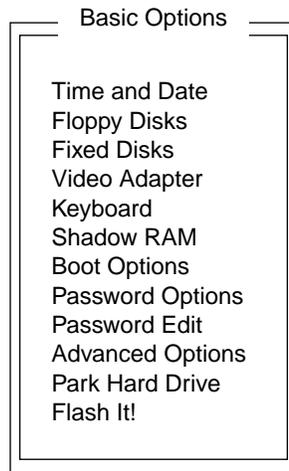
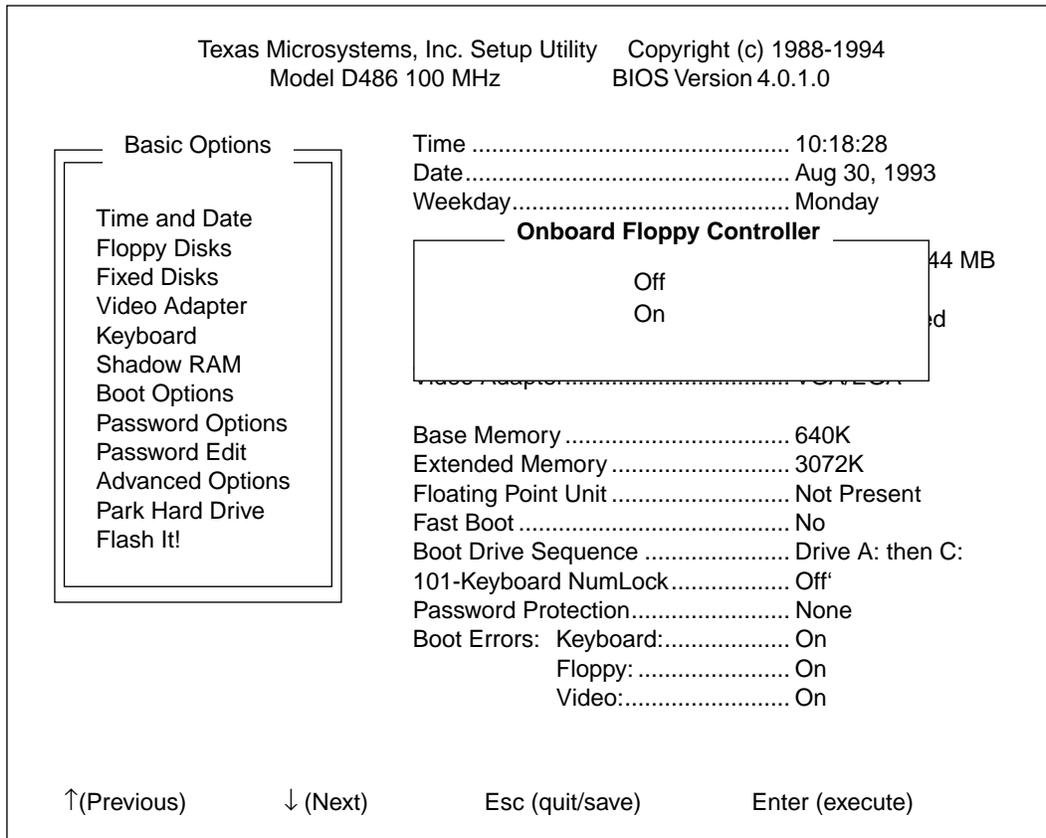**FIGURE 11 - C**

```
        Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                Model D486 100 MHz              BIOS Version 4.0.1.0


      ┌─ Basic Options ─┐        Time ................................................10:18:28
      │                 │        Date ...............................................Aug 30, 1993
      │                 │        Weekday ........................................Monday
      │  Time and Date  │        ┌──────────── Auto ID ────────────┐
      │  Floppy Disks   │     Driv│   Drive Reports:                │MB
      │  Fixed Disks    │     Driv│      Cylinders ...............1024│
      │  Video Adapter  │     Har │      Heads .........................2│
      │  Keyboard       │     Har │      Sectors .......................40│
      │  Shadow RAM     │     Vid │   Drive Table Match:            │
      │  Boot Options   │        │      Type............................17│
      │  Password Options│    Ba s│      Cylinders .................977│
      │  Password Edit  │     Ext │      Heads ..........................5│
      │  Advanced Options│    Flo │      Landing Zone: ..........977│
      │  Park Hard Drive│     Fas │      Write Precomp..........300│
      │  Flash It!      │     Boc │      Sectors .......................17│
      │                 │     101 │      Size ...........................40│
      └─────────────────┘        └─────────────────────────────────┘
                                 Password Protection ........................None
                                 Boot Errors:  Keyboard: ...................On
                                                Floppy:.......................On
                                                Video: .........................On


        Pg Up (Next match)         ESC (Exit)              ENTER (Accept)
```

FIGURE 11 - D

```
Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
          Model D486 100 MHz              BIOS Version 4.0.1.0


   ┌─── Basic Options ───┐      Time ................................................ 10:18:28
   ┌─┴───────────────────┴─┐    Date ................................................ Aug 30, 1993
   │                       │     Weekday ...................................... Monday
   │  Time and Date        │                        ┌────── Auto ID ──────┐
   │  Floppy Disks         │     Drive │             Drive Reports:          │MB
   │  Fixed Disks          │     Drive │                Cylinders.................1024 │
   │  Video Adapter        │     Hard  │                Heads .........................2 │
   │  Keyboard             │     Hard  │                Sectors.......................40 │
   │  Shadow RAM           │     Vide  │             Optional user configurable: │
   │  Boot Options         │           │                Type ...........................47 │
   │  Password Options     │     Base  │                Cylinders.................1053 │
   │  Password Edit        │     Exte  │                Heads .........................2 │
   │  Advanced Options     │     Floa  │                Landing Zone:.........1053 │
   │  Park Hard Drive      │     Fast  │                Write Precomp............ -1 │
   │  Flash It!            │     Boot  │                Sectors.......................40 │
   │                       │     101-  │                Size............................41 │
   └───────────────────────┘           └─────────────────────┘
                                 Password Protection ....................... None
                                 Boot Errors:  Keyboard: ................. On
                                               Floppy:...................... On
                                               Video: ........................ On


   Pg-Up (type=47)              ENTER (Accept)                    ESC (Exit)
```

5.1.4 Video Adapter

This feature allows you to specify the type of video adapter installed in your system. In addition, video configuration errors can be disabled, allowing you to run your system without a video adapter.

FIGURE 12 - A

```
        Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                Model D486 100 MHz              BIOS Version 4.0.1.0


    ┌──── Basic Options ────┐     Time ................................. 10:18:28
    │                       │     Date.................................. Aug 30, 1993
    │                       │     Weekday........................... Monday
    │   Time and Date       │   ┌──── Select Video Adapter Type ────┐
    │   Floppy Disks        │   │                                   │ 4 MB
    │   Fixed Disks         │   │      VGA/EGA                       │
    │   Video Adapter       │   │      CGA 40 x 25                   │ d
    │   Keyboard            │   │      CGA 80 x 25                   │
    │   Shadow RAM          │   │      Monochrome                   │
    │   Boot Options        │   └───────────────────────────────────┘
    │   Password Options    │     Base Memory ....................... 640K
    │   Password Edit       │     Extended Memory ........................... 3072K
    │   Advanced Options    │     Floating Point Unit ........................... Not Present
    │   Park Hard Drive     │     Fast Boot ....................................... No
    │   Flash It!           │     Boot Drive Sequence ...................... Drive A: then C:
    │                       │     101-Keyboard NumLock.................. Off'
    └───────────────────────┘     Password Protection....................... None
                                  Boot Errors:  Keyboard:.................. On
                                                  Floppy: ...................... On
                                                  Video:......................... On


       ↑(Previous)        ↓ (Next)        Esc (quit/save)        Enter (execute)
```

FIGURE 12 - B

```
        Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                Model D486 100 MHz              BIOS Version 4.0.1.0


       ┌─── Basic Options ───┐     Time ...............................................10:18:28
       │                     │     Date ...............................................Aug 30, 1993
       │                     │     Weekday .........................................Monday
       │  Time and Date      │
       │  Floppy Disks       │     ┌─── Video Configuration Errors ───┐
       │  Fixed Disks        │     │                                  │
       │  Video Adapter      │              Off
       │  Keyboard           │              On
       │  Shadow RAM         │     │                                  │
       │  Boot Options       │     └──────────────────────────────────┘
       │  Password Options   │
       │  Password Edit      │     Base Memory..................................640K
       │  Advanced Options   │     Extended Memory...........................3072K
       │  Park Hard Drive    │     Floating Point Unit...........................Not Present
       │  Flash It!          │     Fast Boot........................................No
       │                     │     Boot Drive Sequence ......................Drive A: then C:
       └─────────────────────┘     101-Keyboard NumLock ..................Off'
                                    Password Protection .......................None
                                    Boot Errors:  Keyboard: ..................On
                                                  Floppy:........................On
                                                  Video: ........................On


       ↑(Previous)        ↓ (Next)          Esc (quit/save)        Enter (execute)
```

5.1.5   Keyboard

This option provides several functions. The first menu allows you to enable or disable keyboard configuration errors. If you choose to disable this option, the system will ignore errors it detects in the keyboard configuration during the power-up operation.

The next three menus offer you the ability to set the "Typematic" delay and rate. "Typematic delay" refers to the period that elapses between the time a key is held down until it begins to repeat. "Typematic rate" refers to the rate at which the character will repeat.

Note: Occasionally, .exe programs and TSR's that set the Typematic functions are run from the autoexec.bat file. If used, these programs have precedence over the Setup Utility's "Typematic" functions.

FIGURE 13 - A

```
         Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                   Model D486 100 MHz              BIOS Version 4.0.1.0


    ┌──  Basic Options  ──┐      Time ................................................ 10:18:28
    │                     │      Date................................................ Aug 30, 1993
    │                     │      Weekday......................................... Monday
    │  Time and Date      │      ┌──   Keyboard Configuration Errors   ──┐ 44 MB
    │  Floppy Disks       │      │                                        │
    │  Fixed Disks        │      │              Off                       │
    │  Video Adapter      │      │              On                        │ed
    │  Keyboard           │      │                                        │
    │  Shadow RAM         │      │                                        │
    │  Boot Options       │      └────────────────────────────────────────┘
    │  Password Options   │
    │  Password Edit      │      Base Memory ................................. 640K
    │  Advanced Options   │      Extended Memory ........................... 3072K
    │  Park Hard Drive    │      Floating Point Unit .......................... Not Present
    │  Flash It!          │      Fast Boot ........................................ No
    │                     │      Boot Drive Sequence ..................... Drive A: then C:
    │                     │      101-Keyboard NumLock................. Off'
    └─────────────────────┘      Password Protection....................... None
                                 Boot Errors:  Keyboard:.................. On
                                               Floppy: ...................... On
                                               Video:........................ On


        ↑(Previous)          ↓ (Next)          Esc (quit/save)          Enter (execute)
```

FIGURE 13 - B

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Basic Options

Time and Date
Floppy Disks
Fixed Disks
Video Adapter
Keyboard
Shadow RAM
Boot Options
Password Options
Password Edit
Advanced Options
Park Hard Drive
Flash It!

Time 10:18:28
Date.. Aug 30, 1993
Weekday.. Monday

Set Keyboard Typematic Rates?   44 MB

Yes
No   ed

Base Memory 640K
Extended Memory 3072K
Floating Point Unit .... Not Present
Fast Boot .... No
Boot Drive Sequence .... Drive A: then C:
101-Keyboard NumLock.................. Off'
Password Protection........................ None
Boot Errors: Keyboard:................... On
                        Floppy: .... On
                        Video:......................... On

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

FIGURE 13 - C

```
Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
         Model D486 100 MHz            BIOS Version 4.0.1.0


     ┌── Basic Options ──┐      Time ............................................... 10:18:28
     │                   │      Date................................................ Aug 30, 1993
     │                   │      Weekday........................................ Monday
     │  Time and Date    │      ┌────────────────────────────────────┐44 MB
     │  Floppy Disks     │      │      Keyboard Typematic Delay      │
     │  Fixed Disks      │      │                                    │
     │  Video Adapter    │      │             250 msec               │ed
     │  Keyboard         │      └────────────────────────────────────┘
     │  Shadow RAM       │      Hard Disk 2....................................... Not Installed
     │  Boot Options     │      Video Adapter ................................ VGA/EGA
     │  Password Options │
     │  Password Edit    │      Base Memory .................................. 640K
     │  Advanced Options │      Extended Memory ........................... 3072K
     │  Park Hard Drive  │      Floating Point Unit ........................... Not Present
     │  Flash It!        │      Fast Boot ........................................ No
     │                   │      Boot Drive Sequence ...................... Drive A: then C:
     │                   │      101-Keyboard NumLock.................. Off'
     └───────────────────┘      Password Protection........................ None
                                Boot Errors:  Keyboard:................... On
                                              Floppy: ...................... On
                                              Video:......................... On


     ↑(Previous)        ↓ (Next)        Esc (quit/save)        Enter (execute)
```

FIGURE 13 - D

```
         Texas Microsystems, Inc. Setup Utility     Copyright (c) 1988-1994
                Model D486 100 MHz                  BIOS Version 4.0.1.0


        ┌─ Basic Options ─┐      Time ............................................... 10:18:28
        │                 │      Date................................................ Aug 30, 1993
        │                 │      Weekday......................................... Monday
        │ Time and Date   │      ┌─── Keyboard Typematic Rate ───┐
        │ Floppy Disks    │      │                               │ 4 MB
        │ Fixed Disks     │      │          2.1 chars/sec        │
        │ Video Adapter   │      │                               │ d
        │ Keyboard        │      Hard Disk 2..................................... Not Installed
        │ Shadow RAM      │      Video Adapter ................................ VGA/EGA
        │ Boot Options    │
        │ Password Options│      Base Memory .................................. 640K
        │ Password Edit   │      Extended Memory ........................... 3072K
        │ Advanced Options│      Floating Point Unit ........................... Not Present
        │ Park Hard Drive │      Fast Boot ....................................... No
        │ Flash It!       │      Boot Drive Sequence ..................... Drive A: then C:
        │                 │      101-Keyboard NumLock.................. Off'
        └─────────────────┘      Password Protection....................... None
                                 Boot Errors:  Keyboard:................... On
                                                  Floppy: ....................... On
                                                  Video:........................ On


       ↑(Previous)          ↓ (Next)          Esc (quit/save)          Enter (execute)
```

5.1.6   Shadow RAM

This option requires you to specify where optional ROM-BIOS code is to be located and whether it is cacheable or not. When you select this option, a memory map that displays memory in 16 KByte blocks is displayed. If a ROM is found within that 16 KByte location, the Setup Utility will display the word "ROM," "SHADOW," or "SHADOW + CACHED," where:

- **ROM** - the system will execute code directly from the EPROM on the option card, or

- **SHADOW** - the system will copy the code from the EPROM into DRAM at the same address, allowing code to run from the DRAM on the CPU card (dramatically improving the performance of the system).

- **SHADOW + CACHED** - in addition to begin shadowed, the code is eligible for memory caching (further improving the performance of the system).

A window will also appear to the right of the map. This window displays the following for each option ROM found in the system:

- Starting address of the option ROM
- Length of the option ROM
- Current status (ROM, SHADOW or SHADOW + CACHE)

This window allows you to toggle between running the option ROM from the EPROM in which it resides (by selecting ROM), directing the system to copy it into shadow RAM at power-up (by selecting SHADOW) and allowing that RAM space to be cached (by selecting SHADOW + CACHED).

FIGURE 14

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Basic Options   **Shadow RAM Definitions**

Time and Date
Floppy Disks
Fixed Disks
Video Adapter
Keyboard
Shadow RAM
Boot Options
Password Options
Password Edit
Advanced Options
Park Hard Drive
Flash It!

SHADOW +
CACHED   F000-FFFF (CPU BIOS)

                E000-EFFF

                                Shadow Select

                DC00   Address: C000:0
                D800
                D400   Length: 32K
                D000
                                 Status: SHADOW
                CC00
                C800
                C400
ROM   C000

Spacebar (change)   Enter (execute)

5.1.7 Boot Options

This function is a series of windows that allows you to set the following items:

- Boot Drive Sequence - you can specify the sequence in which drives are accessed (useful when attempting to load an operating system).
- Enable the "FAST BOOT" option. FASTBOOT will bypass memory tests and other configuration steps to speed up the system power-up operation.
- Set status of NumLock key at boot - if a 101-key keyboard is installed, this option directs the BIOS to enable or disable the NumLock key before booting.

FIGURE 15 - A

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

┌──── Basic Options ────┐

Time and Date
Floppy Disks
Fixed Disks
Video Adapter
Keyboard
Shadow RAM
Boot Options
Password Options
Password Edit
Advanced Options
Park Hard Drive
Flash It!

Time 10:18:28
Date ....Aug 30, 1993
Weekday ....Monday

┌──── **Set Boot Drive Sequence** ────┐   14 MB

    Drive A: then C:
    Drive C: then A: d
    Drive A: Only
    Drive C: Only

Base Memory....................................640K
Extended Memory............................3072K
Floating Point Unit............................Not Present
Fast Boot..No
Boot Drive Sequence ....Drive A: then C:
101-Keyboard NumLock...................Off'
Password Protection ....None
Boot Errors: Keyboard: ....On
                   Floppy:.......................On
                   Video: ....On

↑(Previous)   ↓ (Next)   Enter (execute)   Esc (quit/save)

FIGURE 15 - B

```
┌─────────────────────────────────────────────────────────────────┐
│        Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
│               Model D486 100 MHz              BIOS Version 4.0.1.0
│
│      ┌─ Basic Options ─┐      Time .................................................10:18:28
│      │                 │      Date .................................................Aug 30, 1993
│      │ Time and Date   │      Weekday .........................................Monday
│      │ Floppy Disks    │     ┌─── Do you want Fast Booting? ───┐  4 MB
│      │ Fixed Disks     │     │                                 │
│      │ Video Adapter   │     │                                 │  d
│      │ Keyboard        │     │         No                      │
│      │ Shadow RAM      │     │         Yes                     │
│      │ Boot Options    │     │                                 │
│      │ Password Options│     │                                 │
│      │ Password Edit   │     └─────────────────────────────────┘
│      │ Advanced Options│      Extended Memory...........................3072K
│      │ Park Hard Drive │      Floating Point Unit............................Not Present
│      │ Flash It!       │      Fast Boot.........................................No
│      │                 │      Boot Drive Sequence .......................Drive A: then C:
│      └─────────────────┘      101-Keyboard NumLock...................Off'
│                               Password Protection ........................None
│                               Boot Errors:  Keyboard: ...................On
│                                                Floppy:........................On
│                                                Video: .........................On
│
│      ↑(Previous)         ↓ (Next)        Enter (execute)        Esc (quit/save)
└─────────────────────────────────────────────────────────────────┘
```
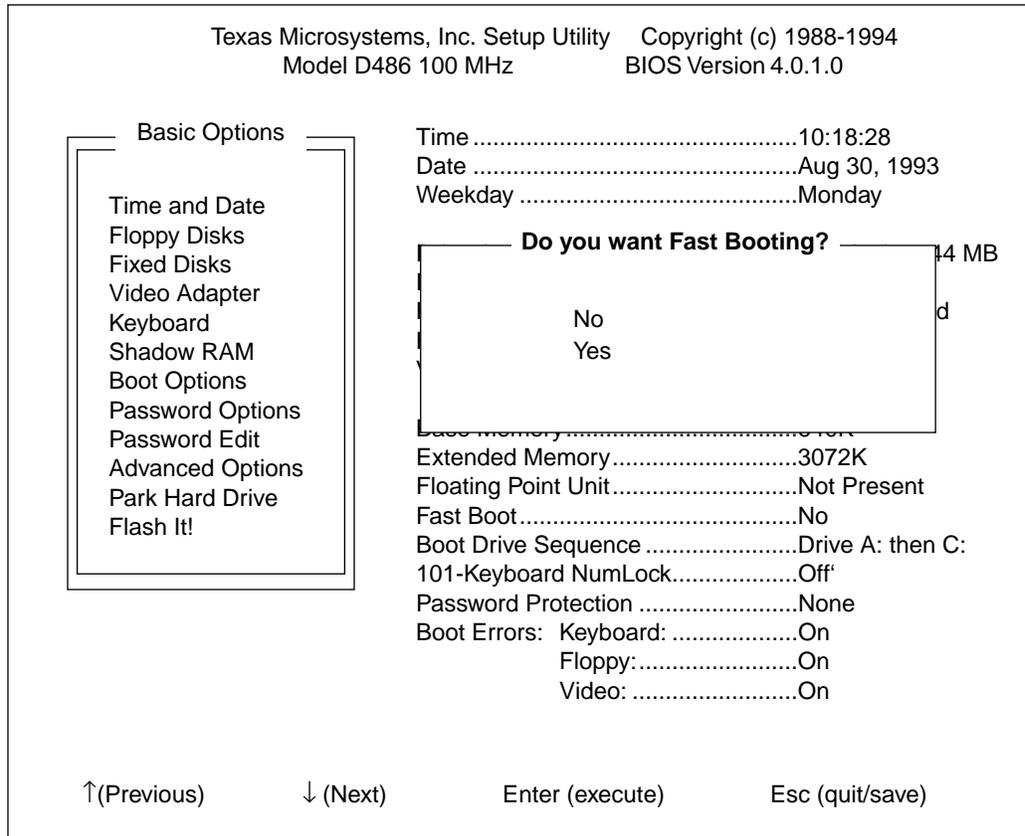
*WARNING: If you enable "Fast Boot," you must turn it off before
making any changes to your CMOS settings (or add RAM memory).
Otherwise, your changes will not be saved.*

FIGURE 15 - C

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Basic Options

Time and Date
Floppy Disks
Fixed Disks
Video Adapter
Keyboard
Shadow RAM
Boot Options
Password Options
Password Edit
Advanced Options
Park Hard Drive
Flash It!

Time 10:18:28
Date.. Aug 30, 1993
Weekday... Monday

101-Key Keyboard NumLock at Bootup
Off
On

44 MB

Drive A: Only
Drive C: Only

Base
Extended memory ....
Floating Point Unit .... Not Present
Fast Boot .... No
Boot Drive Sequence .... Drive A: then C:
101-Keyboard NumLock.................. Off'
Password Protection........................ None
Boot Errors: Keyboard:................... On
              Floppy: .... On
              Video:......................... On

↑(Previous)   ↓ (Next)   Enter (execute)   Esc (quit/save)

5.1.8 Password Options

This feature allows you the option of having no password protection, requiring a password to enter the Setup Utility, or requiring a password to enter Setup and boot. The password is entered from this menu, and you are prompted to enter it again for verification. The password may consist of from one to 12 characters. Letters A to Z (case-sensitive) and numbers 0 to 9 are accepted. If a password is already entered, you must know the password in order to change it.

WARNING: Setting Switch SW1-3 to ON will delete all password protection. In addition, you will force the CPU to load "default" CMOS settings, which may not match your system's configuration. Use the "Flash It!" option (described in Section 5.1.10) to designate your setup configuration as the system default values.

FIGURE 16 - A

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Basic Options

Time and Date
Floppy Disks
Fixed Disks
Video Adapter
Keyboard
Shadow RAM
Boot Options
Password Options
Password Edit
Advanced Options
Park Hard Drive
Flash It!

Time 10:18:28
Date ....Aug 30, 1993
Weekday ....Monday

Password Protect Options

None
Setup Only
Setup and System Boot

Inch, 1.44 MB
Installed
I Installed
Installed
/EGA

Base Memory...................................640K
Extended Memory...........................3072K
Floating Point Unit...........................Not Present
Fast Boot..No
Boot Drive Sequence ....Drive A: then C:
101-Keyboard NumLock..................Off'
Password Protection ....None
Boot Errors: Keyboard: ....On
                        Floppy:.......................On
                        Video: ....On

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

FIGURE 16 - B

```
         Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                  Model D486 100 MHz              BIOS Version 4.0.1.0

      ┌──── Basic Options ────┐      Time .................................................10:18:28
      │                       │      Date .................................................Aug 30, 1993
      │  Time and Date        │      Weekday ..........................................Monday
      │  Floppy Disks         │      ┌──────── Password Edit ────────┐
      │  Fixed Disks          │      │                               │ Inch, 1.44 MB
      │  Video Adapter        │      │                               │ Installed
      │  Keyboard             │      │   New Password ............. ***** │ l Installed
      │  Shadow RAM           │      │                               │ Installed
      │  Boot Options         │      Video Adapter .................................VGA/EGA
      │  Password Options     │
      │  Password Edit        │      Base Memory...................................640K
      │  Advanced Options     │      Extended Memory............................3072K
      │  Park Hard Drive      │      Floating Point Unit...........................Not Present
      │  Flash It!            │      Fast Boot........................................No
      │                       │      Boot Drive Sequence ......................Drive A: then C:
      └───────────────────────┘      101-Keyboard NumLock..................Off'
                                      Password Protection .......................None
                                      Boot Errors:  Keyboard: ..................On
                                                    Floppy:.......................On
                                                    Video: ........................On


      ↑(Previous)          ↓ (Next)          Esc (quit/save)          Enter (execute)
```

5.1.9   Park Hard Drive

When used, this feature allows you to park the heads on each hard drive and protect the drives whenever it is necessary to move or transport the computer. The menu will display a "Continue Park?" prompt. Press "Yes" to park the hard drives, "No" to discontinue this feature.

Hard Disk Head Parking Utility

Before moving your system, it is recommended that you park the heads on each hard drive.

NOTICE: Power off the system when done.

Continue Park?   Yes   No

5.1.10 Flash It!

"Flash It!" permits all selections to be programmed permanently into BIOS memory. That is, in the event of a CMOS power failure or when switch 1-3 is closed, the selections that were current when the "Flash It!" option was selected will be the new "default" values that the system will "load."

IMPORTANT! While the system is "flashing" BIOS memory, it is imperative that the reset switch not be pressed and power is not turned off until the "Flash It!" operation has completed. In the event that the flash operation is interrupted, switch 1-2 must be closed to invoke the auxiliary BIOS in order for the system to operate. It will then be necessary to perform another flash operation which, when successful, will enable switch 1-2 to be opened and control to be returned to the flashed BIOS.

5.2 Advanced Options

Choosing the "Advanced Options" item from the "Basic Options" menu will cause a new menu of options to be displayed. We'll discuss these options in the following sections. The Advanced Options menu is displayed below.

```
┌─ Advanced Options ─┐
│                    │
│  Serial Ports      │
│  Parallel Ports    │
│  Cache             │
│  DRAM Speeds       │
│  Bus-DMA-I/O Speeds│
│  Memory Options    │
│  Miscellaneous     │
│  Basic Options     │
│                    │
└────────────────────┘
```
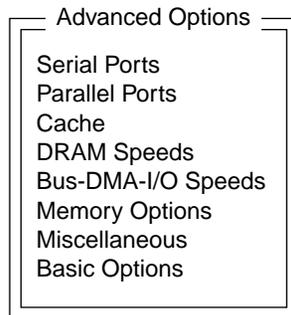
5.2.1   Serial Ports

You can select the port addresses for Serial Port 1 (UART1) and
Serial Port 2 (UART2) using this option. The choices are as follows:

- 3F8
- 2F8
- 3E8
- 2E8
- Disabled

Note: *3F8 and 3E8 must use IRQ4, and 2F8 and 2E8 must use
IRQ3. These items are not user-selectable.*

*If Serial Ports 1 and 2 are given the same base port address,
a window will prompt you to make a choice that will resolve
the conflict. You cannot further configure the system until
the serial ports no longer share the same address.*

FIGURE 17 - A

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Advanced Options

Serial Ports
Parallel Ports
Cache
DRAM Speeds
Bus-DMA-I/O Speeds
Memory Options
Miscellaneous
Basic Options

Onboard Floppy Controller.............. On
Onboard IDE Interface .... On

AT Bus Speed .... CPU Osc Freq ÷ 4
DMA Speed.................................... 1/2 Bus Speed
DRAM
I/O R
CT20
8 Bit
16 Bit
DMA
DMA
Seria

Select Serial Port 1 Address

03F8h, IRQ4
02F8h, IRQ3
03E8h, IRQ4
02E8h, IRQ3
Disabled

Serial Port 2 Address 02F8h, IRQ3
Parallel Port Address 03BCh
Parallel Port IRQ IRQ5
Parallel Port Mode.......................... Bidirectional
Flash I/O Port Address.................... 0270H
Internal 486 Cache......................... Enabled
External 128K DRAM Cache .... Enabled

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

FIGURE 17 - B

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Onboard Floppy Controller...............On
Onboard IDE Interface ....On

┌─ Advanced Options ─┐

Serial Ports
Parallel Ports
Cache
DRAM Speeds
Bus-DMA-I/O Speeds
Memory Options
Miscellaneous
Basic Options

AT Bus Speed   **Select Serial Port 2 Address** CPU Osc Freq ÷ 4
DM   eed
DR   03F8h, IRQ4   es
I/O   02F8h, IRQ3   ks
CT2   03E8h, IRQ4   es
8 Bi   02E8h, IRQ3   es
16   Disabled   es
DM   ck
DM   locks

Serial Port 1 Address.......................03F8h, IRQ4
Serial Port 2 Address.......................02F8h, IRQ3
Parallel Port Address 03BCh
Parallel Port IRQ IRQ5
Parallel Port Mode ....Bidirectional
Flash I/O Port Address 0270H
Internal 486 Cache ....Enabled
External 128K DRAM Cache ....Enabled

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

5.2.2 Parallel Ports

Use this feature to select an address for the on-board parallel port. Standard addresses include:

- 3BC
- 378
- 278
- Disabled

Once you enable a port address, you may choose between IRQ5, IRQ7 and NO IRQ. The parallel port can also be configured as standard AT-compatible or bi-directional.

FIGURE 18 - A

```
        Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                Model D486 100 MHz              BIOS Version 4.0.1.0


                                  Onboard Floppy Controller .............. On
   ── Advanced Options ──         Onboard IDE Interface..................... On

    Serial Ports
    Parallel Ports                AT Bus S Select Parallel Port Address  Osc Freq ÷ 4
    Cache                         DM                                      eed
    DRAM Speeds                   DR          Disabled                    es
    Bus-DMA-I/O Speeds            I/O         03BCh                       ks
    Memory Options                CT          0378h                       es
    Miscellaneous                 8 B         0278h                       es
    Basic Options                 16                                      es
                                  DM                                      ck
                                  DMA Address Hold Time................. 2-3 CPU clocks
                                  Serial Port 1 Address ...................... 03F8h, IRQ4
                                  Serial Port 2 Address ...................... 02F8h, IRQ3
                                  Parallel Port Address....................... 03BCh
                                  Parallel Port IRQ............................. IRQ5
                                  Parallel Port Mode .......................... Bidirectional
                                  Flash I/O Port Address .................... 0270H
                                  Internal 486 Cache ......................... Enabled
                                  External 128K DRAM Cache........... Enabled


     ↑(Previous)         ↓ (Next)          Esc (quit/save)          Enter (execute)
```

FIGURE 18 - B

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

```
 ┌── Advanced Options ──┐
 │                      │
 │ Serial Ports         │
 │ Parallel Ports       │
 │ Cache                │
 │ DRAM Speeds          │
 │ Bus-DMA-I/O Speeds   │
 │ Memory Options       │
 │ Miscellaneous        │
 │ Basic Options        │
 │                      │
 └──────────────────────┘
```

Onboard Floppy Controller...............On
Onboard IDE Interface ....On

AT Bus Speed ....CPU Osc Freq ÷ 4
DMA Speed..................................1/2 Bus Speed
DRAM   states
I/O Re   locks
CT206   No IRQ   states
8 Bit D   IRQ5   states
16 Bit   IRQ7   states
DMA C   clock
DMA A   U clocks
Serial Port 1 Address 03F8h, IRQ4
Serial Port 2 Address 02F8h, IRQ3
Parallel Port Address 03BCh
Parallel Port IRQ IRQ5
Parallel Port Mode...........................Bidirectional
Flash I/O Port Address....................0270H
Internal 486 Cache...........................Enabled
External 128K DRAM Cache ....Enabled

Select Parallel Port IRQ

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

FIGURE 18 - C

```
        Texas Microsystems, Inc. Setup Utility     Copyright (c) 1988-1994
              Model D486 100 MHz              BIOS Version 4.0.1.0

                              Onboard Floppy Controller .............. On
   ┌─ Advanced Options ─┐     Onboard IDE Interface ................... On
   │                    │
   │ Serial Ports       │     AT Bus Speed................................. CPU Osc Freq ÷ 4
   │ Parallel Ports     │     DMA Sp   'Set Parallel Port Mode ' ' Bus Speed
   │ Cache              │     DR                                    ates
   │ DRAM Speeds        │     I/O                                   ocks
   │ Bus-DMA-I/O Speeds │     CT           Bidirectional            ates
   │ Memory Options     │     8 B          Compatible               ates
   │ Miscellaneous      │     16                                    ates
   │ Basic Options      │     DMA CAS Timing Delay ................. 1 CPU clock
   │                    │     DMA Address Hold Time................. 2-3 CPU clocks
   └────────────────────┘     Serial Port 1 Address ...................... 03F8h, IRQ4
                              Serial Port 2 Address ...................... 02F8h, IRQ3
                              Parallel Port Address....................... 03BCh
                              Parallel Port IRQ............................. IRQ5
                              Parallel Port Mode .......................... Bidirectional
                              Flash I/O Port Address .................... 0270H
                              Internal 486 Cache.......................... Enabled
                              External 128K DRAM Cache........... Enabled


       ↑(Previous)          ↓ (Next)          Esc (quit/save)          Enter (execute)
```

5.2.3 Cache

The D486 contains a secondary DRAM cache as well as internal 8 KByte (16 KByte with DX4 CPU) cache. This option allows you to enable both caches; *however, the internal cache must be enabled before the secondary cache can be used.*

The Setup Utility also allows you to define two non-cacheable blocks. After the cache enable options are configured, the "Non-Cacheable Memory Block 1" window appears, followed by the "Non-Cacheable Memory Block 2" window. In each window, the "Block Size" column is highlighted. To increment the block size, press the Page Up key; press the Page Down key to decrement. The block size options for block #1 are 4K, 8K, 16K, 32K, 64K, 128K, 256K, 512K and 1M. For block #2, the size may be 64K, 128K, 256K, 512K, 1M, 2M and 4M.

Once the block size is selected, press the right arrow key to high-light the "Start Addr" column. This column is used to select the start address for the non-cacheable memory block. As with the "Block Size" column, press the Page Up key to increment, Page Down to decrement. The increment unit is the block size selected earlier.

FIGURE 19 - A

```
          Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                 Model D486 100 MHz              BIOS Version 4.0.1.0

                                  Onboard Floppy Controller .............. On
     ┌─── Advanced Options ───┐   Onboard IDE Interface..................... On
     │                        │
     │  Serial Ports          │   AT Bus Speed  Internal 486 Cache   CPU Osc Freq ÷ 4
     │  Parallel Ports        │   DI                               peed
     │  Cache                 │   DF                               tes
     │  DRAM Speeds           │   I/          Disable              cks
     │  Bus-DMA-I/O Speeds    │   C           Enable               tes
     │  Memory Options        │   8                                tes
     │  Miscellaneous         │   16 Bit DMA Wait States .................. 2 wait states
     │  Basic Options         │   DMA CAS Timing Delay ................. 1 CPU clock
     └────────────────────────┘   DMA Address Hold Time ................ 2-3 CPU clocks
                                  Serial Port 1 Address....................... 03F8h, IRQ4
                                  Serial Port 2 Address....................... 02F8h, IRQ3
                                  Parallel Port Address ...................... 03BCh
                                  Parallel Port IRQ.............................. IRQ5
                                  Parallel Port Mode .......................... Bidirectional
                                  Flash I/O Port Address .................... 0270H
                                  Internal 486 Cache .......................... Enabled
                                  External 128K DRAM Cache........... Enabled


         ↑(Previous)        ↓ (Next)        Esc (quit/save)        Enter (execute)
```

FIGURE 19 - B

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Onboard Floppy Controller...............On

┌─ Advanced Options ─┐   Onboard IDE Interface ....On

Serial Ports   AT Bus Speed ....CPU Osc Freq ÷ 4
Parallel Ports   DMA Speed.....................................1/2 Bus Speed
Cache   DRAM Wait   **External DRAM Cache**   states
DRAM Speeds   I/O R
Bus-DMA-I/O Speeds   CT2(Disable
Memory Options   8 Bit   Enable
Miscellaneous   16 B
Basic Options   DMA
                               DMA
                               Serial Port 1 Address 03F8h, IRQ4
                               Serial Port 2 Address 02F8h, IRQ3
                               Parallel Port Address 03BCh
                               Parallel Port IRQ IRQ5
                               Parallel Port Mode...........................Bidirectional
                               Flash I/O Port Address.....................0270H
                               Internal 486 Cache..........................Enabled
                               External 128K DRAM Cache ....Enabled

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

FIGURE 19 - C

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Onboard Floppy Controller...............On
Onboard IDE Interface.....................On

```
┌─ Advanced Options ─┐
│                    │
│ Serial Ports       │
│ Parallel Ports     │
│ Cache              │
│ DRAM Speeds        │
│ Bus-DMA-I/O Speeds │
│ Memory Options     │
│ Miscellaneous      │
│ Basic Options      │
│                    │
└────────────────────┘
```

AT Bus Speed ....CPU Osc Freq ÷ 4
DMA Speed ....1/2 Bus Speed

Non-Cacheable Memory Block 1

Block Size	Start Addr	End Addr
16K	00004000	00007FFF

Serial Port 1 Address.......................03F8h, IRQ4
Serial Port 2 Address.......................02F8h, IRQ3
Parallel Port Address 03BCh
Parallel Port IRQ IRQ5
Parallel Port Mode ....Bidirectional
Flash I/O Port Address 0270H
Internal 486 Cache ....Enabled
External 128K DRAM Cache ....Enabled

↑(Previous)   ↓ (Next)   Pg Up (incr)   Pg Down (decr)   Enter (execute)

FIGURE 19 - D

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Advanced Options

Serial Ports
Parallel Ports
Cache
DRAM Speeds
Bus-DMA-I/O Speeds
Memory Options
Miscellaneous
Basic Options

Onboard Floppy Controller .... On
Onboard IDE Interface .... On

AT Bus Speed................................. CPU Osc Freq ÷ 4
DMA Speed.................................... 1/2 Bus Speed
DRAM Wait States.......................... 2 wait states

Non-Cacheable Memory Block 2

Block Size	Start Addr	End Addr
2M	00200000	003FFFFF

Serial Port 1 Address .... 03F on, IRQ4
Serial Port 2 Address 02F8h, IRQ3
Parallel Port Address....................... 03BCh
Parallel Port IRQ............................. IRQ5
Parallel Port Mode.......................... Bidirectional
Flash I/O Port Address.................... 0270H
Internal 486 Cache......................... Enabled
External 128K DRAM Cache........... Enabled

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

5.2.4   DRAM Speeds

DRAM wait states may be set to 0, 1, 2 or 3. The Setup Utility, how-
ever, will limit the selections offered depending on the CPU oscilla-
tor frequency and other hardware present on the CPU board.

FIGURE 20

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

┌─ Advanced Options ─┐

Serial Ports
Parallel Ports
Cache
DRAM Speeds
Bus-DMA-I/O Speeds
Memory Options
Miscellaneous
Basic Options

Onboard Floppy Controller .... On
Onboard IDE Interface .... On

AT Bus Speed................................. CPU Osc Freq ÷ 4
DMA Speed.................................... 1/2 Bus Speed
DRAM   **Select DRAM Wait States**   it states
I/O F   cks
CT2   0 wait states   tes
8 Bit   1 wait state   tes
16 B   2 wait states   tes
DMA   3 wait states   ock
DMA   clocks
Serial Port 1 Address 03F8h, IRQ4
Serial Port 2 Address 02F8h, IRQ3
Parallel Port Address....................... 03BCh
Parallel Port IRQ............................. IRQ5
Parallel Port Mode .... Bidirectional
Flash I/O Port Address 0270H
Internal 486 Cache.......................... Enabled
External 128K DRAM Cache........... Enabled

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

5.2.5 Bus-DMA-I/O Speeds

This selection will present several menus:

- AT Bus Speed
- DMA Speed
- 8 and 16 bit DMA Wait States
- DMA CAS Timing Delay
- DMA Address Hold Time
- CT206 Read/Write Wait States
- I/O Command Recovery Time

It is not within the scope of this manual to elaborate on the meaning of each of these items or the impact of any particular selection on each menu. Modification of any of these items should be done under the supervision of a Texas Microsystems Technical Support Specialist or other qualified person familiar with these options.

Note: AT Bus speeds exceeding 8 MHz are not recommended, and the DMA speed should be set at 1/2 the bus speed.

FIGURE 21 - A

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Advanced Options

Serial Ports
Parallel Ports
Cache
DRAM Speeds
Bus-DMA-I/O Speeds
Memory Options
Miscellaneous
Basic Options

Onboard Floppy Controller .... On
Onboard IDE Interface .... On

AT Bus Speed................................. CPU Osc Freq ÷ 4
DMA Speed................................... 1/2 Bus Speed
DRAM   **Bus Speed**   it states
I/O F   cks
CT2   CPU Osc Freq ÷ 6 (4.16 Mhz)   ates
8 Bit   CPU Osc Freq ÷ 5 (5.00 MHz)   ates
16 B   CPU Osc Freq ÷ 4 (6.25 MHz)   ates
DMA   CPU Osc Freq ÷ 3 (8.33 MHz)   ock
DMA   CPU Osc Freq ÷ 2 (12.50 MHz)   clocks
Seria   CPU Osc Freq ÷ 8 (3.12 MHz)   RQ4
Seria   RQ3
Para
Parallel Port IRQ.............................. IRQ5
Parallel Port Mode........................... Bidirectional
Flash I/O Port Address 0270H
Internal 486 Cache.......................... Enabled
External 128K DRAM Cache........... Enabled

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

FIGURE 21 - B

```
Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
           Model D486 100 MHz             BIOS Version 4.0.1.0


 ┌─ Advanced Options ─┐      Onboard Floppy Controller .............. On
 │                    │      Onboard IDE Interface ................... On
 │ Serial Ports       │
 │ Parallel Ports     │      AT Bus Speed................................ CPU Osc Freq ÷ 4
 │ Cache              │      DMA Speed................................... 1/2 Bus Speed
 │ DRAM Speeds        │      DRAM        DMA Speed           it states
 │ Bus-DMA-I/O Speeds │      I/O F                           cks
 │ Memory Options     │      CT2    1/2 Bus Speed (4.16 MHz)  ites
 │ Miscellaneous      │      8 Bit     Bus Speed (8.33 MHz)   ites
 │ Basic Options      │      16 B                             tes
 │                    │      DMA CAS Timing Delay ................. 1 CPU clock
 └────────────────────┘      DMA Address Hold Time................. 2-3 CPU clocks
                             Serial Port 1 Address ...................... 03F8h, IRQ4
                             Serial Port 2 Address ...................... 02F8h, IRQ3
                             Parallel Port Address...................... 03BCh
                             Parallel Port IRQ.............................. IRQ5
                             Parallel Port Mode.......................... Bidirectional
                             Flash I/O Port Address.................... 0270H
                             Internal 486 Cache.......................... Enabled
                             External 128K DRAM Cache........... Enabled


   ↑(Previous)        ↓ (Next)         Esc (quit/save)      Enter (execute)
```

*Note: The speeds displayed in this menu are based on the bus speed
you selected in the previous menu. DMA speeds greater than 8 MHz
or faster than 1/2 the bus speed can cause floppy drive access prob-
lems and miscellaneous problems with other plug-in cards.*

FIGURE 21 - C

```
        Texas Microsystems, Inc. Setup Utility     Copyright (c) 1988-1994
               Model D486 100 MHz              BIOS Version 4.0.1.0


  ┌─── Advanced Options ───┐    Onboard Floppy Controller .............. On
  │                        │    Onboard IDE Interface .................... On
  │  Serial Ports          │
  │  Parallel Ports        │    AT Bus Speed................................. CPU Osc Freq ÷ 4
  │  Cache                 │    DMA Speed.................................... 1/2 Bus Speed
  │  DRAM Speeds           │    DRAM     8 Bit DMA Wait States    it states
  │  Bus-DMA-I/O Speeds    │    I/O                                      cks
  │  Memory Options        │    CT2          1 wait state             ates
  │  Miscellaneous         │    8 Bit        2 wait states            ates
  │  Basic Options         │    16 B         3 wait states            ates
  │                        │    DMA          4 wait states            ock
  └────────────────────────┘    DMA                                  clocks
                                Serial Port 1 Address ...................... 03F8h, IRQ4
                                Serial Port 2 Address ...................... 02F8h, IRQ3
                                Parallel Port Address....................... 03BCh
                                Parallel Port IRQ............................. IRQ5
                                Parallel Port Mode.......................... Bidirectional
                                Flash I/O Port Address .................... 0270H
                                Internal 486 Cache.......................... Enabled
                                External 128K DRAM Cache........... Enabled


      ↑(Previous)          ↓ (Next)          Esc (quit/save)          Enter (execute)
```

FIGURE 21 - D

```
            Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                    Model D486 100 MHz              BIOS Version 4.0.1.0


                                          Onboard Floppy Controller .............. On
         ─ Advanced Options ─             Onboard IDE Interface ................... On

          Serial Ports
          Parallel Ports                  AT Bus Speed................................. CPU Osc Freq ÷ 4
          Cache                           DMA Speed.................................... 1/2 Bus Speed
          DRAM Speeds                     DRAM   16 Bit DMA Wait States       it states
          Bus-DMA-I/O Speeds              I/O                                      cks
          Memory Options                  CT2          1 wait state              tes
          Miscellaneous                   8 Bit        2 wait states             tes
          Basic Options                   16 B         3 wait states             tes
                                          DMA          4 wait states             ck
                                          DMA                                    clocks
                                          Serial Port 1 Address ..................... 03F8h, IRQ4
                                          Serial Port 2 Address ..................... 02F8h, IRQ3
                                          Parallel Port Address...................... 03BCh
                                          Parallel Port IRQ............................. IRQ5
                                          Parallel Port Mode.......................... Bidirectional
                                          Flash I/O Port Address.................... 0270H
                                          Internal 486 Cache......................... Enabled
                                          External 128K DRAM Cache........... Enabled


        ↑(Previous)         ↓ (Next)          Esc (quit/save)        Enter (execute)
```

FIGURE 21 - E

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
Model D486 100 MHz   BIOS Version 4.0.1.0

Onboard Floppy Controller .... On
Onboard IDE Interface .... On

┌─ Advanced Options ─┐

Serial Ports
Parallel Ports
Cache
DRAM Speeds
Bus-DMA-I/O Speeds
Memory Options
Miscellaneous
Basic Options

AT Bus Speed................................. CPU Osc Freq ÷ 4
DMA Speed .... 1/2 Bus Speed
DRAM   **DMA CAS Timing Delay**   it states
I/O   cks
CT2   1/2 CPU Clock   ites
8 Bit   1 CPU Clock   ites
16 B   ites
DMA CAS Timing Delay .... 1 CPU clock
DMA Address Hold Time................. 2-3 CPU clocks
Serial Port 1 Address 03F8h, IRQ4
Serial Port 2 Address 02F8h, IRQ3
Parallel Port Address....................... 03BCh
Parallel Port IRQ............................. IRQ5
Parallel Port Mode .... Bidirectional
Flash I/O Port Address 0270H
Internal 486 Cache.......................... Enabled
External 128K DRAM Cache........... Enabled

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

Advanced Options

FIGURE 21 - F

```
        Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                Model D486 100 MHz              BIOS Version 4.0.1.0

                                 Onboard Floppy Controller .............. On
    ┌─ Advanced Options ─┐       Onboard IDE Interface .................... On
    │                    │
    │  Serial Ports      │       AT Bus Speed................................. CPU Osc Freq ÷ 4
    │  Parallel Ports    │       DMA Speed.................................... 1/2 Bus Speed
    │  Cache             │       DRAM    DMA Address Hold Time      it states
    │  DRAM Speeds       │       I/O    ┌─────────────────────────┐  cks
    │  Bus-DMA-I/O Speeds│       CT2    │     1-2 CPU Clocks       │  ites
    │  Memory Options    │       8 Bit  │     2-3 CPU Clocks       │  ites
    │  Miscellaneous     │       16 B   └─────────────────────────┘  ites
    │  Basic Options     │       DMA CAS Timing Delay ................. 1 CPU clock
    └────────────────────┘       DMA Address Hold Time................. 2-3 CPU clocks
                                 Serial Port 1 Address ...................... 03F8h, IRQ4
                                 Serial Port 2 Address ...................... 02F8h, IRQ3
                                 Parallel Port Address....................... 03BCh
                                 Parallel Port IRQ............................. IRQ5
                                 Parallel Port Mode.......................... Bidirectional
                                 Flash I/O Port Address .................... 0270H
                                 Internal 486 Cache......................... Enabled
                                 External 128K DRAM Cache........... Enabled


      ↑(Previous)         ↓ (Next)         Esc (quit/save)        Enter (execute)
```

FIGURE 21 - G

Texas Microsystems, Inc. Setup Utility   Copyright (c) 1988-1994
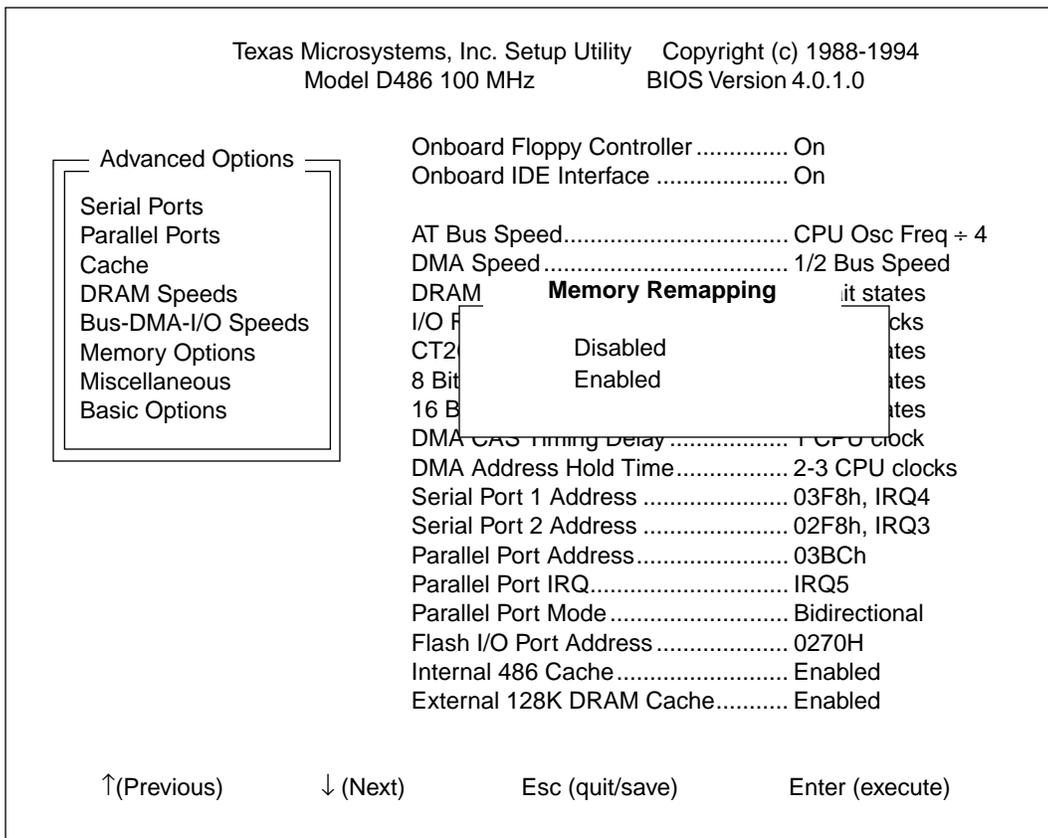Model D486 100 MHz   BIOS Version 4.0.1.0

Advanced Options

Serial Ports
Parallel Ports
Cache
DRAM Speeds
Bus-DMA-I/O Speeds
Memory Options
Miscellaneous
Basic Options

Onboard Floppy Controller .... On
Onboard IDE Interface .... On

AT Bus Speed.................................. CPU Osc Freq ÷ 4
DMA Speed .... 1/2 Bus Speed
DRAM **CT206 Read/Write Wait States** it states
I/O F   cks
CT2   1 wait state   tes
8 Bit   2 wait states   tes
16 B   3 wait states   tes
DMA   4 wait states   ock
DMA   clocks
Serial Port 1 Address 03F8h, IRQ4
Serial Port 2 Address 02F8h, IRQ3
Parallel Port Address....................... 03BCh
Parallel Port IRQ............................. IRQ5
Parallel Port Mode .... Bidirectional
Flash I/O Port Address 0270H
Internal 486 Cache.......................... Enabled
External 128K DRAM Cache........... Enabled

↑(Previous)   ↓ (Next)   Esc (quit/save)   Enter (execute)

FIGURE 21 - H

```
       Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
              Model D486 100 MHz              BIOS Version 4.0.1.0


 ┌─ Advanced Options ─┐      Onboard Floppy Controller .............. On
 │                    │      Onboard IDE Interface .................... On
 │ Serial Ports       │
 │ Parallel Ports     │      AT Bus Speed................................. CPU Osc Freq ÷ 4
 │ Cache              │      DMA Speed.................................... 1/2 Bus Speed
 │ DRAM Speeds        │      DRAM  I/O Command Recovery Time   it states
 │ Bus-DMA-I/O Speeds │      I/O F                                    cks
 │ Memory Options     │      CT2        2 Bus Clocks               ites
 │ Miscellaneous      │      8 Bit      4 Bus Clocks               ites
 │ Basic Options      │      16 B       8 Bus Clocks               ites
 │                    │      DMA        12 Bus Clocks              ock
 └────────────────────┘      DMA                                   clocks
                             Serial Port 1 Address ...................... 03F8h, IRQ4
                             Serial Port 2 Address ...................... 02F8h, IRQ3
                             Parallel Port Address...................... 03BCh
                             Parallel Port IRQ............................. IRQ5
                             Parallel Port Mode .......................... Bidirectional
                             Flash I/O Port Address .................... 0270H
                             Internal 486 Cache.......................... Enabled
                             External 128K DRAM Cache........... Enabled


    ↑(Previous)        ↓ (Next)        Esc (quit/save)        Enter (execute)
```

5.2.6 Memory Remapping

The D486 memory remapping feature, when enabled, removes DRAM from optional ROM BIOS address space at A0000-BFFFF and D0000-EFFFF and appends this 256K to the end (or top) of DRAM. Therefore, enabling the remapping feature disables shadowing of option ROM's in those address spaces.

FIGURE 22

```
        Texas Microsystems, Inc. Setup Utility    Copyright (c) 1988-1994
                Model D486 100 MHz              BIOS Version 4.0.1.0


                           Onboard Floppy Controller .............. On
   ┌─ Advanced Options ─┐  Onboard IDE Interface .................... On
   │                    │
   │ Serial Ports       │  AT Bus Speed................................ CPU Osc Freq ÷ 4
   │ Parallel Ports     │  DMA Speed.................................... 1/2 Bus Speed
   │ Cache              │  DRAM    Memory Remapping        it states
   │ DRAM Speeds        │  I/O                             cks
   │ Bus-DMA-I/O Speeds │  CT2        Disabled            tes
   │ Memory Options     │  8 Bit      Enabled            tes
   │ Miscellaneous      │  16 B                          tes
   │ Basic Options      │  DMA CAS Timing Delay ................. 1 CPU clock
   │                    │  DMA Address Hold Time................. 2-3 CPU clocks
   └────────────────────┘  Serial Port 1 Address ...................... 03F8h, IRQ4
                           Serial Port 2 Address ...................... 02F8h, IRQ3
                           Parallel Port Address....................... 03BCh
                           Parallel Port IRQ.............................. IRQ5
                           Parallel Port Mode ........................... Bidirectional
                           Flash I/O Port Address .................... 0270H
                           Internal 486 Cache.......................... Enabled
                           External 128K DRAM Cache........... Enabled


      ↑(Previous)         ↓ (Next)          Esc (quit/save)        Enter (execute)
```

5.2.7 Miscellaneous

This selection will offer additional option menus only if certain non-standard "BIOS extensions" have been installed in BIOS memory. One such extension is the Serial Redirection BIOS. When this extension is installed, the Miscellaneous selection will permit selection of a serial port, baud rate and other options pertaining to the BIOS extension.

Any installed BIOS extension will be accompanied with documentation explaining options available under the Miscellaneous selection.

5.3 Switch SW1-3 - Reload Default Setup Utility Values

Occasionally, you may encounter a situation when the CMOS RAM (Complementary Metallic Oxide Semiconductor Random Access Memory) becomes corrupted. This condition is usually accompanied by a "lock-up" of the system. The factory default Setup Utility values for D486 operation must then be reloaded into CMOS RAM.

Under normal conditions, SW1-3 should remain in the "OPEN" position. However, when factory default values must be reloaded, follow these procedures:

1. Remove power from the system and place SW1-3 in the "CLOSED" position.
2. Restore power to the system. The message "System Switch 3 is ON - Default System Configuration Loaded" will appear on the screen.
3. After waiting a few seconds, remove power from the system, place SW1-3 in the OPEN position and restore power.

Depending on the specifics of the system, the D486 may boot. If it does, you can modify the setup after pressing the "S" key during memory tests. If the D486 cannot boot, the messages "Invalid Configuration Information" and "Please Run Setup Program" and the prompts "Strike F1 to continue" and "Strike F2 for Setup" will appear on the screen. Strike the F2 key to recall the Setup Utility and reset the parameters as needed. Press the ESC key to save the setup parameter values and reboot the system.

CHAPTER 6   # Memory Configuration

The D486 supports up to 64 MBytes of on-board memory in various configurations. Memory can be added to the D486 through the installation of SIMM's (Single Inline Memory Modules).

Three SIMM types (256 KByte, 1 MByte and 4 MByte) are supported by the D486. These 4x36 SIMM's can be installed in Backs 0, 1, 2 and 3, designated as S1, S2, S3 and S4 in Figure 23. Table 1 summarizes the supported memory configurations.

CAUTION: Before installing SIMM's, remove power from the system by disconnecting the power cord from the power source. After power has been removed, remove the D486 from the chassis. Only qualified, experienced electronics personnel should access the interior of a chassis.

CAUTION: The components of the D486 Card are very sensitive to static discharge. A grounding wrist strap is provided with your D486 to help remove static electricity. While out of the unit, D486 components should be placed on a static-dissipative surface or into a static-shielding bag.

FIGURE 23
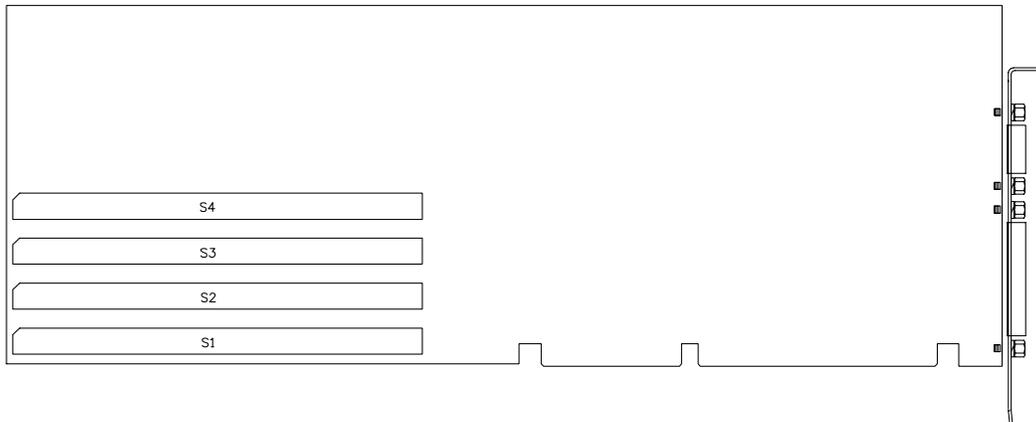
Table 1: Supported DRAM Configurations

S1	S2	S3	S4	Total Memory
256K	0	0	0	1 MByte
256K	256K	0	0	2 MByte
256K	256K	256K	0	3 MByte
256K	256K	256K	256K	4 MByte
256K	1M	0	0	5 MByte
256K	256K	1M	0	6 MByte
256K	1M	1M	0	9 MByte
256K	256K	1M	1M	10 MByte
1M	0	0	0	4 MByte
1M	1M	0	0	8 MByte

Table 1: Supported DRAM Configurations

S1	S2	S3	S4	Total Memory
1M	1M	1M	0	12 MByte
1M	1M	1M	1M	16 MByte
1M	4M	0	0	20 MByte
1M	1M	4M	0	24 MByte
1M	4M	4M	0	36 MByte
1M	1M	4M	4M	40 MByte
4M	0	0	0	16 MByte
4M	4M	0	0	32 MByte
4M	4M	4M	0	48 MByte
4M	4M	4M	4M	64 MByte

CHAPTER 7   # General Maintenance

As with any electronic hardware, an adequate maintenance program will enhance the D486's ability to provide dependable performance. In general terms, maintenance includes periodic inspection of the D486 to ensure that it is clean and free from signs of dirt, dust, wear and stress. However, the D486 should be cleaned by a Texas Micro Service Representative.

Caution: Always remove power from the system before inspecting the D486 Card. Disconnect the power cord from the power source. Only experienced electronics personnel should access the interior of a computer chassis.

Warning: Do not allow moisture or condensation to contact D486 components; damage to sensitive components may occur.

Inspect all cables and connectors to verify that they are securely fastened to their connecting components. Replace worn or stressed cables and connectors.

All peripheral equipment used with the D486 should be properly maintained. Malfunctioning equipment should be immediately replaced to prevent damage to the D486 CPU.

7.1   Lithium Battery

The D486 CPU Card contains a built-in, high-capacity lithium bat-
tery that retains the correct time, date and computer parameters in
CMOS memory when the system is powered OFF. This retained
information assists BIOS in performing initialization and configura-
tion during power-up or reset operations. The battery is designed to
provide years of service without replacement. However, if configura-
tion or clock-related inconsistencies occur, or the D486 has been in
service for more than four (4) years, the battery may require
replacement.

Battery replacement kits may be purchased from Texas Micro, or
you can return the D486 to the factory for service. Contact your
Texas Micro sales representative for details. Please note, however,
that only experienced electronics personnel should attempt this pro-
cedure.

*CAUTION: Always remove power from the system before replacing
the D486 battery. To ensure that no damage occurs, the power cord
should be disconnected from the power source. Only experienced elec-
tronics personnel should replace the D486 battery.*

*CAUTION: The components of the D486 Card are very sensitive to
static discharge. Therefore, Texas Microsystems recommends using a
grounding wrist strap to remove all static electricity prior to touch-
ing the components. While out of the unit, D486 components should
be placed on a static-dissipative surface or into a static-shielding
bag.*

*WARNING: Due to risk of fire or explosion, do not recharge, force
open or heat the D486 battery or dispose of the battery in fire.*

*WARNING: Improper replacement of the battery may cause damage
to the D486 and void the warranty acquired with the purchase of the
D486 Card.*

7.2 Return Procedure

In instances where Texas Microsystems products require service, the factory must be contacted and a Return Goods Authorization (RGA) must be obtained. When requesting an RGA number, please provide the product serial number as well as your sales order number (SO#) and/or the model/serial # of the Texas Micro chassis (if applicable) into which the D486 was installed. When authorization is given, a Return Goods Authorization number will be issued. This RGA number must appear on all packing materials and correspondence to ensure proper handling. In all instances, including return for warranty repair, an RGA must be obtained and noted, or the factory will be unable to accept delivery.

7.3 Technical Support

Texas Microsystems provides on-line technical support available during weekdays from 7:00 a.m. to 6:00 p.m. (Central Time) for your convenience. Our staff of trained professionals welcomes the opportunity to answer your questions and assist you with your technical requirements. Just call us toll-free at 1-800-627-8700. We can also be reached at 1-713-541-8200. To expedite your request, please have the Texas Microsystems product model and serial number available. Thank you!

Specifications

Form Factor: 13.25" (33.66 cm) x 4.75" (12.45 cm).

Bus Interface: AT Bus (98-pin), fully-buffered

Addressing: Real and protected mode supported
                          Real address mode - 20-bit
                          Protected address mode - 16-bit on bus access

Data Path: 32-bit on-board, 16-bit on bus access

Interrupts: 15 levels available

DMA Channels: Four (4) 8-bit, three (3) 16-bit

Cache: 128 KByte, zero wait states @ 25 ° Çwrite-back
                          secondary

Flash Memory: 1 MBit (128 KBytes)

Power   Input power   16.5 watts
Requirements: +5V   1.6 to 2.8A
                          +12V   0.1A
                          -12V   0.1A

Environmental:
Temperature   0° to 60° C
                          (32° to 140°F) (operating)
                          -40° to 70° C
                          (-40° to 158° F) (non-operating)

Humidity   0 to 95% @ 40° C (non-condensing)

Shock   1.25G @ 10ms duration (operating)
                          10G @ 10ms duration (non-operating)

Vibration   0.25G @ 5-100 Hz
                          5G @ 5-100Hz

NOTES