

EDITION

May 1992

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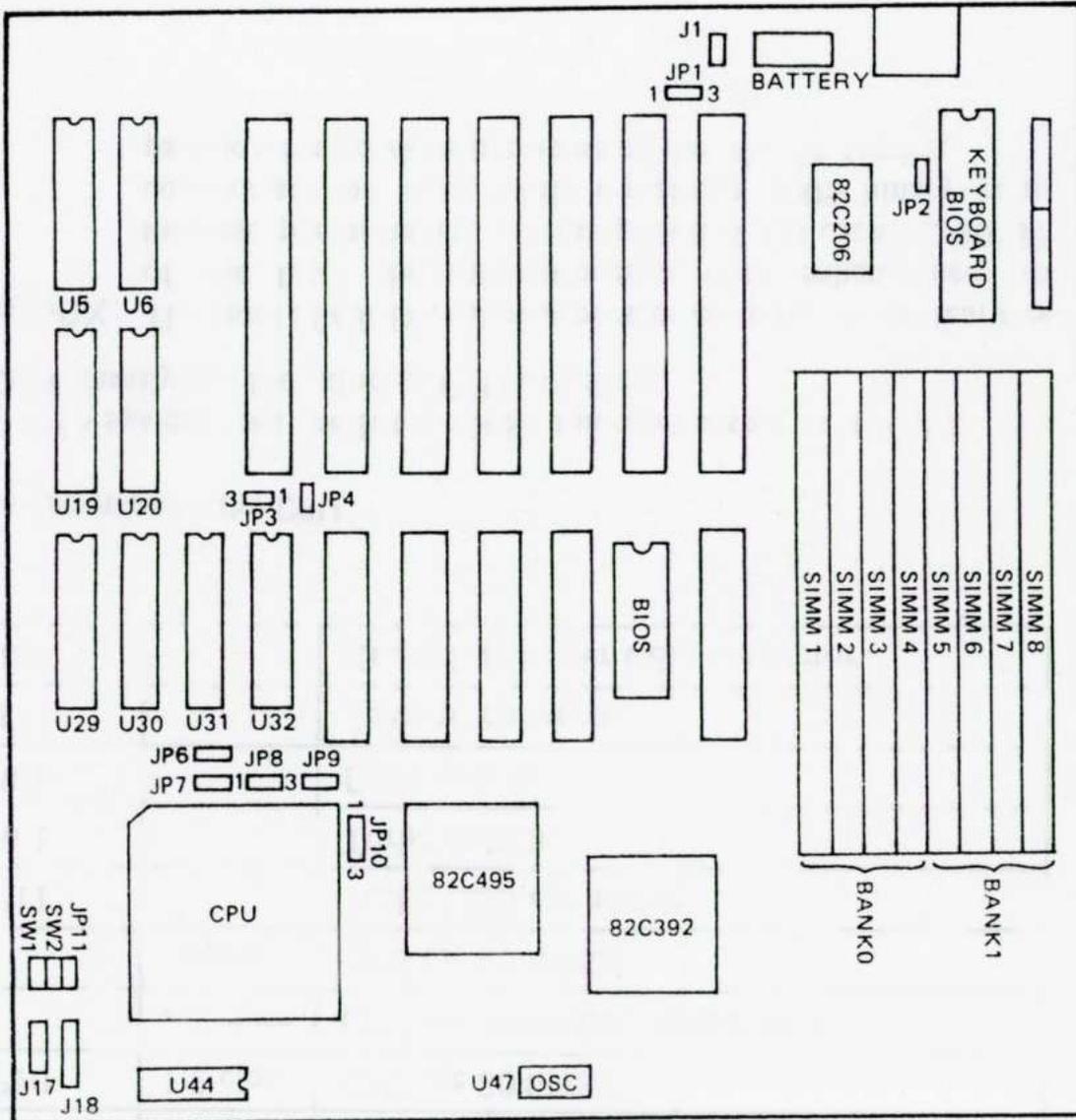
CHAPTER 1 Introduction

The Purpose of this manual is to help you, the user, set up, install and maintain your JET486 system board. Much additional information is also included in the Technical Reference section.

1.1 System Board Specification

CPU	– Intel 80486DX/80486SX
Coprocessor	– 80387DX included in 80486DX
Speed	– 20/25/33/50 MHz system speed – 8 MHz (programmable) I/O Bus speed – H/W and S/W speed switchable function (cache or non-cache)
Cache Memory	– 8 KB cache memory included in 80486 DX/SX – 64 KB/128 KB/256 KB 2nd cache memory on board – Support 486 BURST mode on 2nd Cache memory access
DRAM Memory	– Up to 32 MB on system board – Use 256 KB/1 MB/4 MB 80 ns SIMM Module DRAM
Shadow RAM	– Main BIOS shadow function programmable – Video BIOS shadow function programmable – Shadow RAM cacheable function programmable
Slot	– 8 bit XT slot × 2, 16 bit AT slot × 5
Dimension	– 220mm × 220mm, with stand mounting hole

1.2 Board Layout



1.3 Jumper Pin Setting Table

TABLE 1

JUMPER Pin	Status	Function
J1		External Battery connector
JP1	1,2 close	Clear CMOS value
	2,3 close	Use on board battery
JP2	close	color display
	open	MONO display
JP3	1,2 close	Cache RAM size 128KB
	2,3 close	Cache RAM size 64KB or 256KB
JP4	open	Cache RAM size 64KB
	close	Cache RAM size 128KB or 256KB
JP6, JP7	open	Cache RAM size 64KB
	JP6, close JP7, open	Cache RAM size 128KB
	JP6, close JP7, close	Cache RAM size 256KB

TABLE II

JUMPER Pin	Status	Function
JP8	1,2 close	CPU use 80486DX, 80486DX 2 or 80487SX
	2,3 close	CPU use 80486SX
JP9	close	CPU use 80486DX, 80486DX 2 or 80487SX
	open	CPU use 80486SX
JP10	1,2 close	CPU use 80487SX
	2,3 close	CPU use 80486DX, 80486DX 2
	open	CPU use 80486SX
JP11		Turbo LED connector
SW2		Turbo switch
SW1		Reset switch
J17		Speaked connector
J18		Keylock & Power LED connector

1.4 Introduction to the CPU

The JET-486 system uses the Intel 80486 microprocessor as its CPU. The Intel 80486 family has four kind of CPU as below:

- (A) 80486DX: The Intel 80486DX microprocessor contains all the features of the Intel 386 microprocessor with enhancement to increase performance. It integrated 8 KB cache & 80387 coprocessor on chip while remaining 100% binary compatible with previous members of the 80x 86 family.

- (B) 80486DX2: The 80486DX2 microprocessor is 100% pin & Binary compatible with the 80486DX microprocessor but the CPU Core that is twice as fast as the memory bus — the internal core of the 80486DX2 CPU operates at twice the frequency of the external bus and thereby provides internal execution at twice the speed of the input clock. When the system clock is 25 MHz, the 80486DX2 CPU executes at 50 MHz. When the system clock is 33 MHz the 80486DX2 CPU executes at 66 MHz.
- (C) 80486SX: The Intel 80486SX microprocessor provides a low-cost entry point to powerful 80486DX microprocessor. The Intel 486SX microprocessor has the same integrated RISC integer core. 8 KB cache memory and memory management unit as the 80486DX microprocessor.
- (D) 80487SX: The Intel 487SX Math coprocessor provides optional math upgrade capability for users who want to increase their floating-point performance on the softwares.

1.5 Introduction To The System Controller

The JET-486 System board uses the OPTi-486 WB chip set as system controller to create an ISA compatible board. The OPTi486WB is a three-chip solution offering optimal performance for high-end 486DX and 486SX/487SX based AT system it includes 82C495 system controller, The 82C495 integrates a write back-cache controller, local DRAM controller. AT bus state machine, and CPU state machine.

The 82C392 integrates data buffers. AT bus control decode logic for and external Keyboard controller, reset logic and clock generation logic, and the 82C206 Integrated Peripheral controller.

CHAPTER 2. Hardware Setup

When you install your JET-486 in a system case, various jumper settings and connections must be made. They are:

Jumper settings:

Secondary level cache memory size
CPU selection
Display adaptor selection

Connections:

Keyboard lock & Power LED
Hardware reset
Turbo switch & Turbo LED
Speaker connector
Keyboard connector
Power connector

These are explained in detail in the following sections.

2.1 Cache RAM Size Setting

There are three possible choices: 64KB, 128KB or 256KB depending on how much cache memory you install.

64KB cache: insert 8K×8 SRAM into U44 for tag RAM
insert 8K×8 SRAM into U5, U6, U19, U20, U29, U30, U31,
U32 for SRAM.

128KB cache: insert 8K×8 SRAM into U44 for tag RAM
insert 32K×8 SRAM into U29, U30, U31, U32 for SRAM

256KB cache: insert 32K×8 SRAM into U44 for tag RAM
insert 32K×8 SRAM into U5, U6, U19, U20, U29, U30,
U31, U32 for SRAM

The following table list the jumper setting required for each cache memory configuration listed above.

Cache memory size	JP3	JP4	JP6, JP7
64KB	2,3 close	open	open
128KB	1,2 close	close	JP6 close & JP7 open
256KB	2,3 close	close	JP6 close & JP7 close

2.2 Display Adaptor Selection

Set the JP2 jumper depending on whether you are using a monochrome or color (CGA) display adaptor. If using an EGA or VGA adaptor, the JP2 setting is irrelevant.

JP2 close if color Graphic adaptor in use.

JP2 open if monochrome adaptor in use (default setting)

2.3 Keyboard Connector

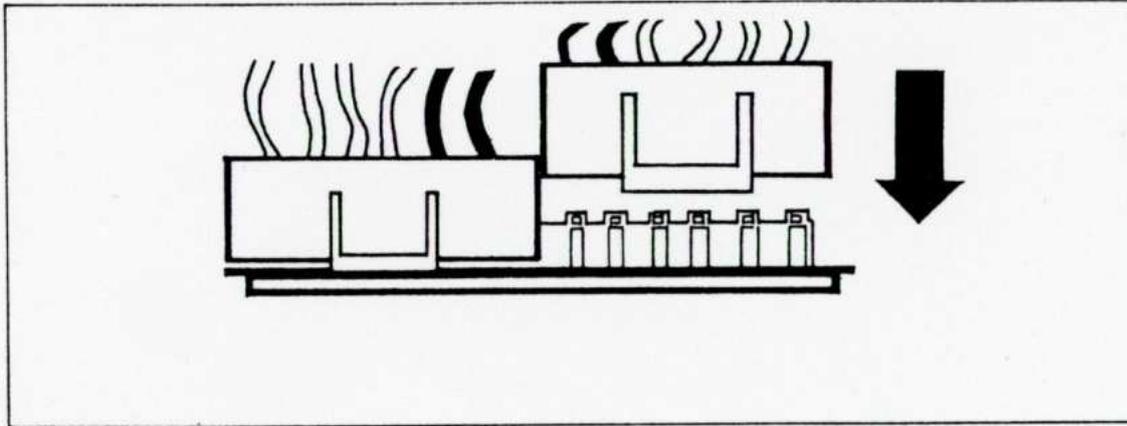
Connect the Keyboard cable jack to the 5-pin DIN connector labelled KB.

The pin assignment are:

- 1 = Keyboard clock
- 2 = Keyboard data
- 3 = Spare
- 4 = GND
- 5 = +5V DC

2.4 Power Connector

The power supply cables connect to the large white 12-pin connector. The two power supply connectors can only fit on in one orientation. Be sure to arrange the wires as shown, so that the black wires are at the centre.

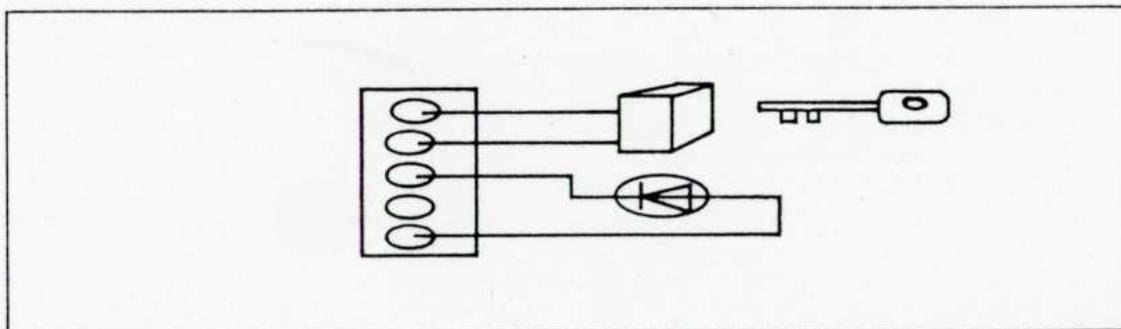


2.5 Keylock & Power LED Connector

The J18 connector connects to the power LED, which shows when the board is powered on, and to the keylock (if one is fitted to your system case). The keylock allows you to “lock” your keyboard, thus making it difficult for others to gain access to your PC. If security is a real concern, do not rely on this lock.

The pinout is as follows:

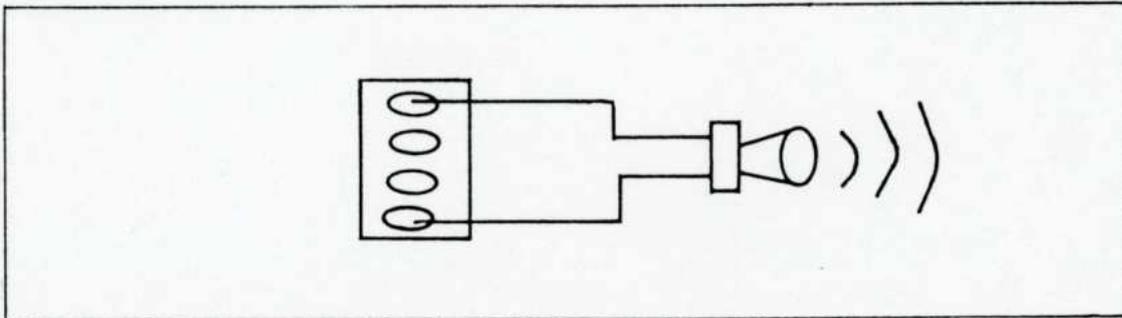
- | | |
|-------------|---------------|
| 1 = GND | 3 = GND |
| 2 = Keylock | 4 = NC |
| | 5 = Power LED |



2.6 Speaker Connector

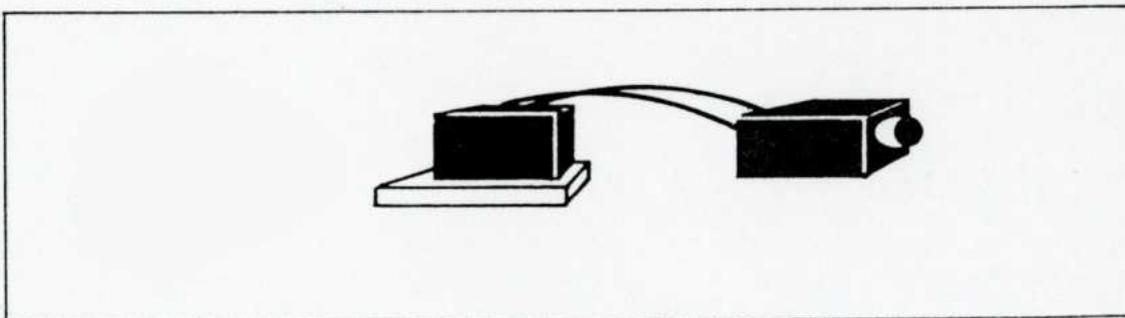
The J17 connector is where you connect the cable from the case speaker. The pinout is as follows:

- 1 = VCC
- 2 = NC
- 3 = GND
- 4 = Speaker data



2.7 Hardware Reset

The SW1 connector is where you connect the cable from the Reset button on your system case. This button allows you to reboot the computer without switching it off.



2.8 Turbo LED & Turbo Switch

This feature enables and disables a toggle switch within the system which is able to change the system speed. When the switch is ON, the system speed is in the fast Turbo Mode. When the switch is OFF it is in the Normal Speed Mode.

Turbo Switch	Turbo LED	Speed
Short	Light On	Turbo
Open	Light Off	Normal

When TURBO Switch (SW2) is functioned you could select speed by:

- (1) <ctrl> + <Alt> + <+> = Cache On
- (2) <Ctrl> + <Alt> + <-> = Cache Off

2.9 CPU Selection

Set the JP8, JP9 & JP10 Jumper depending on whether you are using a 80486DX (80486DX2), 80487SX or 80486SX as you CPU.

The following table is the jumper setting for CPU selection:

CPU type	JP8	JP9	JP10
80486DX (80486DX2)	1,2 close	close	2,3 close
80487SX	1,2 close	close	1,2 close
80486SX	2,3 close	open	open

CHAPTER 3. Memory System

The JET-486 uses three levels of memory: the primary 8KB on-chip cache, the secondary 64 or 256KB on-board SRAM cache, and the up-to-32MB main on-board SIMM memory.

3.1 Cache Memory

The JET-486 has three levels of cache memory: 8KB on the i486 chip itself, and either 64KB, 128KB or 256KB on board. The on-board chip are 25 to 20 nanosecond static RAM chip. The purpose of these caches is to provide very high speed memory access to the data that the CPU is most likely to require next, in this way, the CPU will search both caches first, if the require data is found, this counts as a "hit", and no wait state penalty is incurred. If the CPU has to search the much slower 80 nanosecond DRAM main memory, extra cycles are require and processing is slower, such "misses" should be infrequent and the JET-486 should run on average very close to zero wait states.

3.2 Installing SIMM Modules

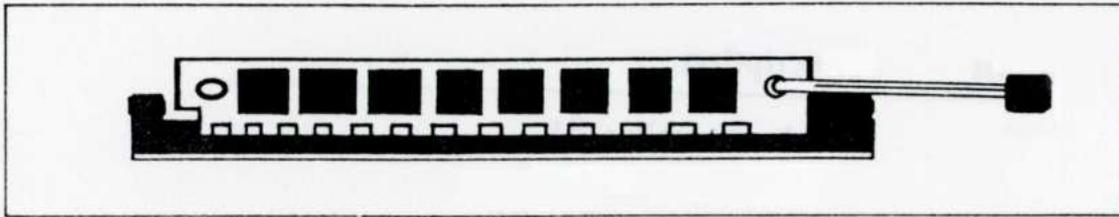
The main memory uses DRAM chips mounted in sets of Three or nine chips on modules. These modules are called Single In-line Memory Modules (SIMM). Three sizes of modules can be used: 256KB, 1MB & 4MB.

On the board there are eight black plastic holders for these modules, labelled SIMM1 ~ SIMM8.

Bank 0 is SIMM1 ~ 4; Bank 1 is SIMM5 ~ 8.

To install the SIMM modules, start from Bank 0 and completely fill the required bank with SIMM modules of the same size.

Removal is more difficult than installation and requires the gentle use of a suitable tool (e.g. a screwdriver).



3.3 Memory Configurations

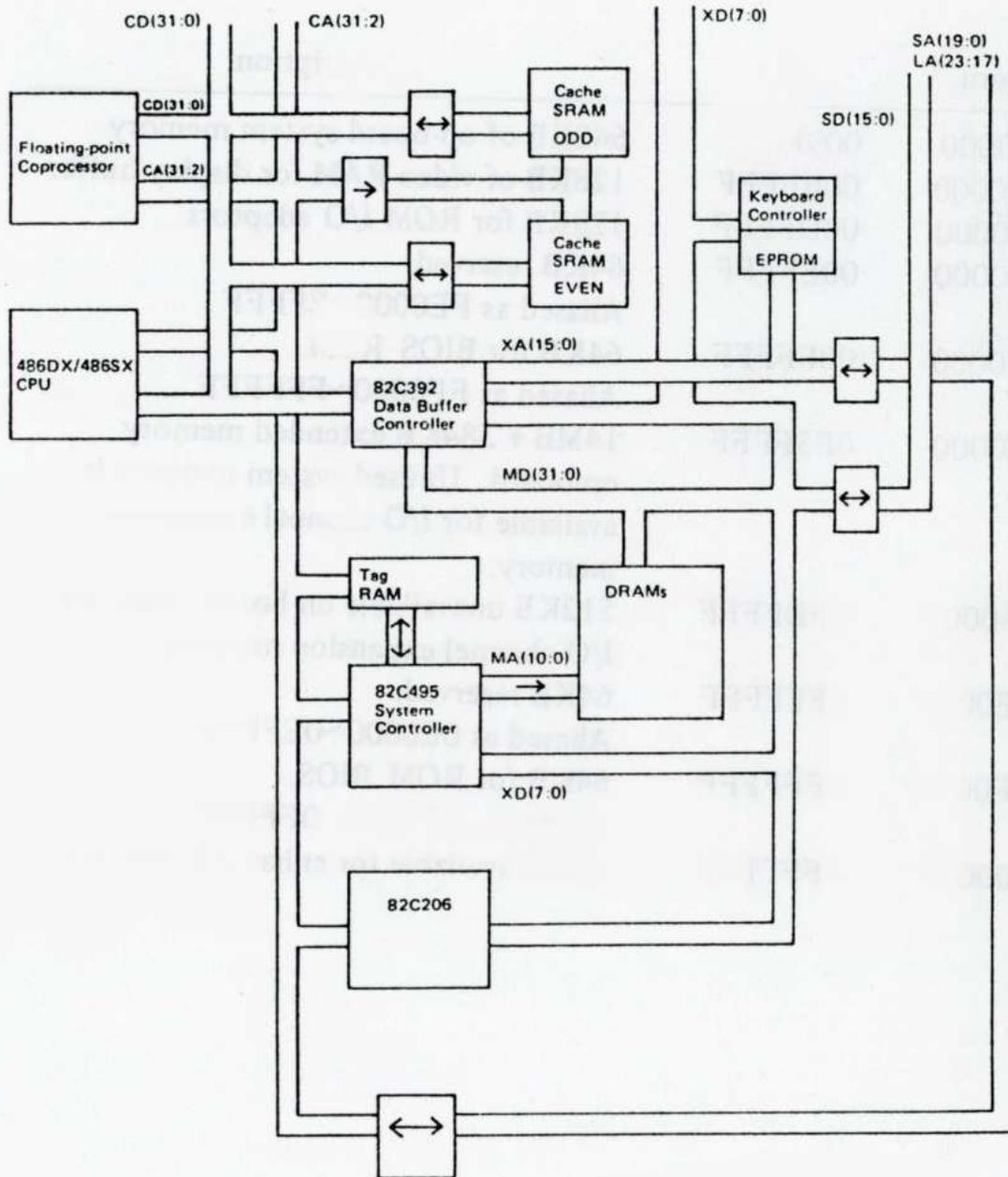
This is a table of the possible on-board memory configurations:

Bank 0 (SIMM1 ~ 4)	Bank 1 (SIMM5 ~ 8)	Total memory
256KB		1MB
256KB	256KB	2MB
1MB		4MB
1MB	256KB	5MB
1MB	1MB	8MB
4MB		16MB
4MB	256KB	17MB
4MB	1MB	20MB
4MB	4MB	32MB

CHAPTER 4. Technical Reference

The information included in this section goes beyond what is necessary if you merely wish to install and use the board.

4.1 System Block Diagram



4.2 Memory Mapping

The PC/AT architecture defines a 24-bit byte memory addressing scheme, allowing mapping up to 16MB. The JET-486 board goes beyond this, providing enhanced system addressing from 16MB up to 32MB, while retaining 100% compatibility. The system board addressing shown is shown below:

From	To	Description
0000000	009FFFF	640KB of on-board system memory
00A0000	00BFFFF	128KB of video RAM for display buffer
00C0000	00DFFFF	128KB for ROM I/O adaptors
00E0000	00EFFFF	64KB reserved. Aliased as FE0000~EFFFF
00F0000	00FFFFFF	64KB for BIOS ROM. Aliased as FF0000~FFFFFF
0100000	0F5FFFF	14MB + 384KB extended memory on-board. Unused system memory is available for I/O channel expansion memory.
0F60000	0FDFFFF	512KB unavailable on board. Used by I/O channel expansion memory.
0FE0000	0FEFFFF	64KB reserved. Aliased as 0E0000~0EFFFF
0FF0000	0FFFFFFF	64KB for ROM BIOS. Aliased as 0F0000~0FFFFFF
1000000	3FFFFFFF	48MB available for enhanced memory.

4.3 I/O Address Mapping

I/O Address	Description
000 ~ 01F	DMA controller #1
022 ~ 023	OPTI chip controller
024 ~ 03F	Interrupt controller #1
040 ~ 05F	Timer
060 ~ 06F	Keyboard controller
070 ~ 07F	Real Time Clock, NMI mask, Microcache program enable
080 ~ 09F	DMA page register
0A0 ~ 0BF	Interrupt controller #2
0C0 ~ 0DF	DMA controller #2
0F0	Clear math processor Busy
0F1	Not used
0F8 ~ 0FF	Math coprocessor
1F0 ~ 1F8	Fixed disk
200 ~ 207	Game I/O
278 ~ 27F	Parallel port #2
2F8 ~ 2FF	Serial port #2
300 ~ 31F	Prototype card
360 ~ 36F	Reserved
378 ~ 37F	Parallel port #1
380 ~ 38F	SDLC, bisynchronous #2
3A0 ~ 3AF	Bisynchronous #1
3B0 ~ 3BF	Monochrome display & printer adaptor
3C0 ~ 3CF	Reserved
3D0 ~ 3DF	Color/Graphics monitor adaptor
3F0 ~ 3F7	Diskette controller
3F8 ~ 3FF	Serial port #1

Note:

Addresses 000~0FF are reserved for system board I/O.
Addresses 100~3FF are available on the I/O channel.

4.4 I/O Channel Pin Assignment

Signal	Pin	Pin	Signal
GND	B1	A1	-I/O CH CK
RESET DRV	B2	A2	SD7
+5V DC	B3	A3	SD6
IRQ9	B4	A4	SD5
-5V DC	B5	A5	SD4
DRQ2	B6	A6	SD3
-12V DC	B7	A7	SD2
OWS	B8	A8	SD1
+12V DC	B9	A9	SD0
GND	B10	A10	-I/O CH RDY
-SMEMW	B11	A11	AEN
-SMEMR	B12	A12	SA19
-IOW	B13	A13	SA18
-IOR	B14	A14	SA17
-DACK3	B15	A15	SA16
DRQ3	B16	A16	SA15
-DACK1	B17	A17	SA14
DRQ1	B18	A18	SA13
REFRESH	B19	A19	SA12
CLK	B20	A20	SA11
IRQ7	B21	A21	SA10
IRQ6	B22	A22	SA9
IRQ5	B23	A23	SA8
IRQ4	B24	A24	SA7
IRQ3	B25	A25	SA6
-DACK2	B26	A26	SA5
T/C	B27	A27	SA4
BALE	B28	A28	SA3
+5V DC	B29	A29	SA2
OSC	B30	A30	SA1
GND	B31	A31	SA0
-MEM CS16	D1	C1	SBHE
-I/O CS16	D2	C2	LA23
IRQ10	D3	C3	LA22
IRQ11	D4	C4	LA21
IRQ12	D5	C5	LA20

IRQ15	D6	C6	LA19
IRQ14	D7	C7	LA18
-DACK0	D8	C8	LA17
DRQ0	D9	C9	-MEMR
-DACK5	D10	C10	-MEMW
-DAQ5	D11	C11	SD8
-DRCK6	D12	C12	SD9
DRQ6	D13	C13	SD10
-DACK7	D14	C14	SD11
DRQ7	D15	C15	SD12
+5V DC	D16	C16	SD13
-MASTER	D17	C17	SD14
GND	D18	C18	SD15

4.5 Timer, DMA Channel & Interrupt Level

4.5.1 Timer

The System Board has 3 programmable timers controlled by the 82C206 timer.

Timer channel 0:	System timer to interrupt controller
Timer channel 1:	Dynamic RAM refresh interrupt
Timer channel 2:	Speaker tone generator

4.5.2 DMA channel

The JET-486 board has 8 DMA channels controlled by the 82C206 chip.

DMA channel 0:	Spare
DMA channel 1:	SDLC
DMA channel 2:	Diskette Adaptor
DMA channel 3:	Spare
DMA channel 4:	Cascade for DMA Controller 1
DMA channel 5:	Spare
DMA channel 6:	Spare
DMA channel 7:	Spare

4.5.3 Interrupt Level

The 82C206 peripheral controller provides 16 levels of system interrupt. They are:

Interrupt	Description
NMI	Parity check error
IRQ0	System timer interrupt from 82C206
IRQ1	Keyboard output buffer full
IRQ2	Interrupt re-routing from IRQ8 through IRQ15
IRQ3	Serial port #2
IRQ4	Serial port #1
IRQ5	Parallel port #2
IRQ6	Floppy disk adaptor
IRQ7	Parallel port #1
IRQ8	Real time clock
IRQ9	Re-routing to INT10 from hardware IRQ2
IRQ10	Spare
IRQ11	Spare
IRQ12	Spare
IRQ13	Main coprocessor
IRQ14	Hard disk adaptor
IRQ15	Spare

4.6 Real Time Clock & Non-Volatile RAM

The real time clock and 64 bytes of non-volatile RAM are in the 82C206, backed up by 4.5V rechargeable battery. Some of the reserved bytes are used for the configuration information.

Address	Description
00	Seconds
01	Second alarm
02	Minutes
03	Minute alarm
04	Hours
05	Hour alarm
06	Day of week
07	Date of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown
10	Diskette drive byte-drives A & B
11	Reserved
12	Fixed drive byte-drives C & D
13	Reserved
14	Equipment byte
15	Low-base memory
16	High-base memory
17	Low-expansion memory byte
18	High-expansion memory byte
19	High-expansion memory byte
1A~2D	Reserved
2E~2F	Two byte CMOS checksum
30	Low-expansion memory byte
31	High-expansion memory byte
32	Data century byte
33	Information flags (set during power on)
34~3F	Reserved

4.7 Power Supply

Your JET-486 needs a power supply of at least 200 Watts, with a steady voltage in the range 4.95~5.25V DC. Connection to the board is outlined in section 2.4.

CHAPTER 5. Installation Guide

If installing your JET-486 in a system case, follow the instructions in this section. Refer to other sections as indicated.

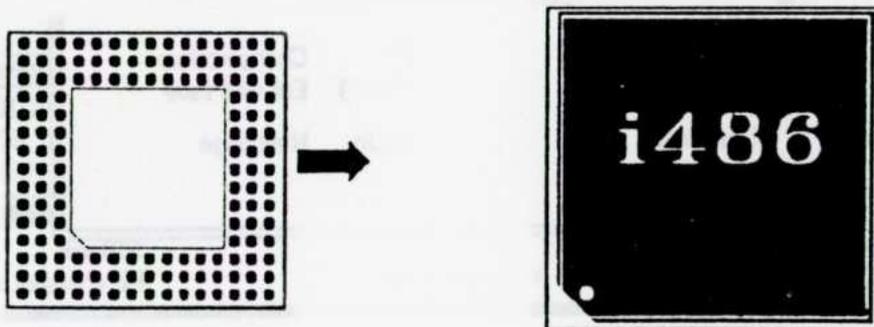
5.1 Static Precautions

Before removing your JET-486 system board from its anti-static bag, be sure to ground yourself by touching an earthed metal object. For real security, wear a pair of anti-static gloves. Static discharge, very common in dry or air-conditioned climates, can destroy electronic components.

5.2 Installing the CPU

If the i486 CPU has not been mounted on the JET-486 board, you may install it thus:

- (i) Refer to layout diagram in section 1.4 to find the correct socket for the i486.
- (ii) Note that both the socket and the i486 chip are assymetrical, and then align accordingly. Press home.



5.3 Installing the Memory Modules

Refer to the whole of section 3, paying particular attention to sections 3.2 & 3.3.

5.4 Setting the Jumper Switches

Refer to sections 2.1 & 2.2 to set the jumpers for the secondary cache, the display adaptor, and CPU selection.

5.5 Mounting in the System Case

The JET 486 has six mounting holes. Attach the board firmly to the interior of your case using the insulated fastenings which should come supplied with your case.

5.6 Making Case Connections

Refer to the sections listed below to make all the external connections to your JET-486 system board.

- 2.3 Keyboard Connector
- 2.4 Power Connector
- 2.5 Keylock & Power LED Connector
- 2.6 Speaker Connector
- 2.7 Hardware Reset
- 2.8 Turbo LED & Turbo switch

5.7 I/O Systems

You will also need to install your display adaptor card and make connection to your monitor. See their documentation.

Similarly you will want to install floppy and hard disk drives in the system case and connect them to your disk controller card which will occupy a 16-bit slot on the JET-486 system board. See their documentation.

With your system assembled, you can now go through the firmware setup explained in the next section.

CHAPTER 6 CMOS Setup for Award BIOS

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

HOW TO USE SETUP

Entering Setup

Power on the computer, press CTRL-ALT-ESC when the below message appears at the bottom of the screen during the POST (Power On Self Test) procedure, you will see the first page of Setup Menu (Figure 1):

TO ENTER SETUP BEFORE BOOT PRESS CTRL-ALT-ESC

Figure 1 Page 01: Status Page

Date : 01 Jan 1991 Time : 00:00:00		XXXX BIOS (1XXXXXXXX) Award Software, Inc.			
Drive A : 1.2M, 5 1/4 in. Drive B : 1.4M, 5 1/4 in.		Base Memory : 640K Extended Memory : 1024K Expanded Memory : 0K Other Memory : 384K			
Video : VGA/EGA Halt On : All Errors		Total Memory : 2048K			
Cache : Disable Shadow : System Security : System Access		Boot Sequence : A, C Virus Warning : Enable			
Drive C : 10 (20Mb)	CYLS. 820	HEADS 3	SECTORS 17	PRECOMP None	LANDZONE 820
Drive D : 35 (110Mb)	1024	13	17	None	1023
Alt-F1 for Menu Help Page 01: Status Page		PgDn = Options Page		F10 exit F2 change colors	

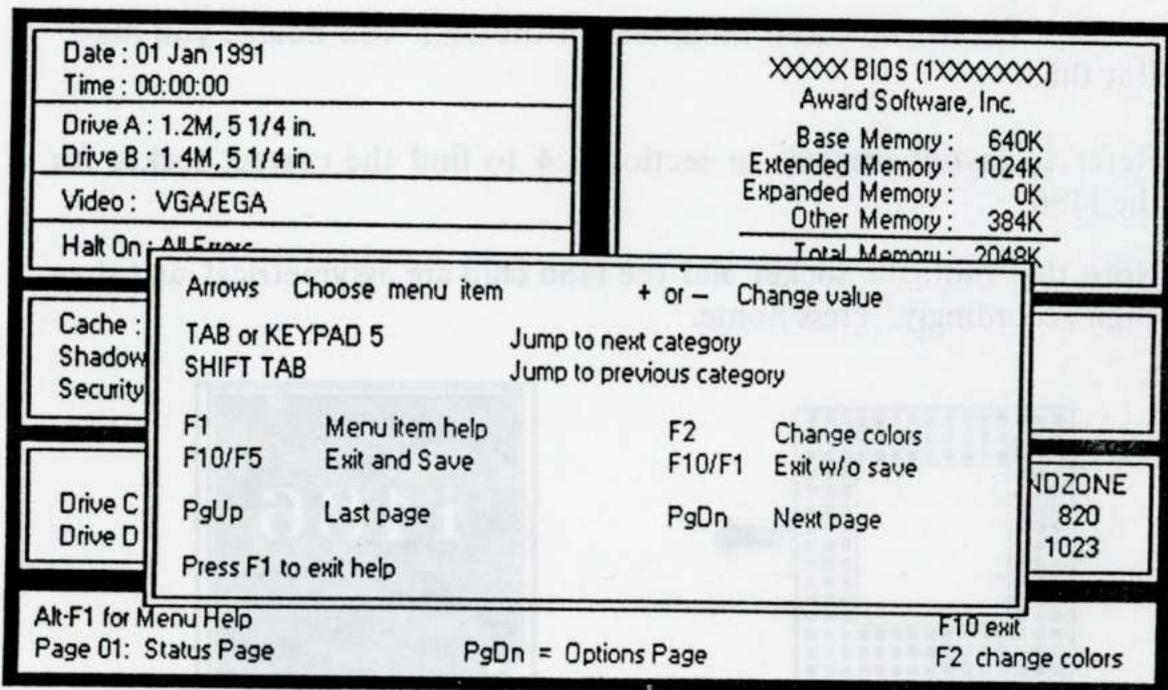
If you do not press these keys at the correct time and the system boots, press CTRL-ALT-DEL to reboot the system and try again. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to,

PRESS F1 TO CONTINUE OR CTRL-ALT-ESC TO ENTER SETUP

Getting Help

Press Alt-F1 to get general help on how to use Setup menu. General Help Menu (Figure 2) is,

Figure 2 General Help Menu



To exit help press F1.

Press F1 when a field is highlighted to “pop up” a small help window that describes the appropriate keys to use and the possible selections for the highlighted option. To exit the Help Window press F1 again.

Using Setup

Use the cursor arrows to move the cursor right or left, up or down.

Press + or - to increase or decrease the numeric value, or change to the next or previous value.

Tab or Keypad 5 will move to the first selection in the next box. Shift Tab will move to the first selection of the current box and then each successive Shift Tab will move to the first selection of the previous box.

Use PgDn or PgUp to move to the next or previous Setup Menu.

Press F2 to change the video output from color to monochrome. This function is designed to improve the quality of the Setup screen on composite monitors.

Exiting Setup

Press F10 to exit. Once F10 is pressed, you will be asked to press F5 to exit Setup and save any changes you have made, or press F1 to exit Setup without saving any of the changes.

STATUS MENU

User-Changeable Options

There are two types of fields in the Status page of the Setup Menu, changeable and display only. This section describes the changeable fields.

Date and Time

Date format is: <day> <month><century><year>

Time format is: <hour> <minute> <seconds>

The hour is calculated base on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

Drive A and Drive B

The choices for the type of diskette drive(s) installed in the system are,

None	No floppy drive installed
360K, 5-1/4 in.	5-1/4 inch PC-type standard drive: 360 kilobyte capacity
1.2M, 5-1/4 in.	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3-1/2 in.	3-1/2 inch single-sided drive; 720 kilobyte capacity
1.44M, 3-1/2 in.	3-1/2 inch double-sided drive; 1.44 megabyte capacity

Video

It selects the type of adapter used for the primary system monitor,

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, or PGA monitor adapters
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

Error Halt

This setting determines whether the computer will stop if an error is detected during power up. For most situations, the Halt On All Errors selection should be used.

All Error	Whenever the BIOS detects a non-fatal error the system will be stopped and the user will be prompted
No Error	System boot will not stop for any error that may be detected
All, But Keyboard	System boot will stop for all errors except a keyboard error
All, But Diskette	System boot will stop for all errors except a disk error
All, But Disk/Key	System boot will stop for all errors except a keyboard or disk error

Select Halt On All, But Disk so the system will not halt if it fails to detect any disk drives. Computers that are employed in multi-user systems as a file server might not use a keyboard and should not halt when a keyboard error is detected. The BIOS will support a videoles environment regardless of this selection.

Cache (Optional)

This setting speeds up memory access. Two options, enable and disable. The default value is disable. This option differs from CPU or chipset design.

Shadow (Optional)

It determines whether BIOS will be copied to RAM, however, it is optional from chipset design. System shadow will improve the system performance while video shadow will increase the video speed. Some EGA/VGA do not work with this function.

Disable	System and video shadow are disable.
System	Default value, system shadow is enable.
Video	Video shadow is enable.
System/Video	System and video shadow are enable.

Security

This allows the user to limit access to the system and Setup, or just to Setup. There are three possible settings:

Disable	No security is enabled. The system will boot and the user can enter Setup freely.
System Access	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup Access	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

When the selection is set to Disable, the message appeared at the bottom of the screen will say:

Press <Enter> to Clear Password

Pressing Enter now will clear previously entered password from CMOS memory. If you have already entered a password, then set the selection to Disable and do not press Enter, the previous password will remain in CMOS memory and can be used again by setting the selection to System Access or Setup Access. If you press Enter to clear the password, and then set this selection to System Access or Setup Access without enter-

ing a new password, the password will simply a carriage return (press Enter) when prompted.

The System Access and Setup Access selections will display the message:

Press <Enter> to Change Password

If you press Enter at this time, you will be asked to enter a new password. Type the password, up to eight characters, and press Enter. You will be asked to confirm the password. Type the password again and press Enter. You may also press Esc to abort the selection and not enter a password.

If you select System Access, you will be prompted for the password every time the system is rebooted or any time you try to enter Setup. If you select Setup Access, you will be prompted only when you try to enter Setup.

If you forget the password you are using, contact the manufacturer of the system or the dealer where you purchased the system.

Boot Sequence

This option determines which drive computer searches first for the disk operating system (DOS). Default value is A, C which system will first search for diskette drive then fixed disk drive. The other option is C, A.

Virus Warning

This setting flashes on the screen. When it is enabled, the Award BIOS will detect a virus during and after boot up. If an attempt is made to write to the boot sector or partition table of HDD, the system will be halted, a highlighted warning message and a warning beep sound consists of 4 short beeps will appear to warn the user. The sound will continue until a key has been pressed. This usually indicates that virus is trying to destroy the system. However, if the user is in process of initializing the fixed disk he can ignore the message and press "Y" to continue the procedure. Note: The warning message only appears in text mode. If your system is in graphic mode, there will only be the beep sound.

Disable	System will not be stopped if BIOS detects a write to the boot sector or partition table of HDD. The NO WARNING message will be display displayed.
Enable	Default value, is automatically set.. When the BIOS detects a write to the boot sector or partition table of HDD, the system will be stopped and a highlighted warning message will be displayed.

If this setting is set to disble, after POST is done, the following message appears in a box at the top of the screen.

<p>VIRUS WARNING IS DISABLED NO WARNING IF BOOT SECTOR IS TO BE MODIFIED CHANGE SETUP TO ENABLE VIRUS WARNING</p>

Note: It is not quaranteed that all virus can be detected by the BIOS. Award will not be responsible for any damages caused by virus. However, it is recommended that all the software programs you use carry legal copyright to void possible damages by virus.

Drive C and Drive D

The disk selections identify the types of fixed disk drives that have been installed in the computer.

Press the + or - key to select a higher or lower numbered fixed disk type, or type the number and press Enter. Notice that the specifications of your drive must match with the drive table. If it is not matched or listed, you can define your own drive type. Type 48 and 49 are user-definable.

If a fixed disk has not been installed select NONE using the + and - keys, or type 0 and press Enter.

User-Definable Drives

To define your own drive type, select type 48 or 49 using the + or - keys, or type the number and press Enter. When you select one of these types,

notice that the selection for cylinder (CYLS) and heads, etc. will become highlighted. Enter the number directly from the keyboard and press Enter. Then repeat this for each of the drive parameters. The specification for these fields should be included in the documentation that came with the drive. If you cannot find this information, contact the manufacturer of the drive or the dealer where you purchased the drive.

Display-Only Options

There are two types of fields in the Status Page of the Setup Menu, changeable and display only. This section describes the display-only fields which are determined by POST of the BIOS..

Base Memory

The value of base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or more memory installed on the motherboard.

Extended Memory

This is the amount of memory located above 1MB in the CPU's memory address map.

Expanded Memory

Expanded Memory is memory defined by the Lotus/intel/Microsoft (LIM) standard as EMS. Many standard DOS applications can not utilize memory above 640K. the Expanded Memory Specification (EMS) swaps memory which not utilized by DOS with a section, or frame, so these applications can access all of the system memory. Memory can be swapped by EMS is usually 64K within 1MB or memory above 1MB, depends on the chipset design.

Expanded memory device driver is required to use memory as Expanded Memory.

Other Memory

This refers to the memory located in the 640K to 1024K address space. Most use for this area is Shadow RAM.

6.1 Award BIOS POST Message.

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message **PRESS F1 TO CONTINUE OR CTRL-ALT-ESC TO ENTER SETUP** will be shown in the information box at the bottom.

POST Beep

Currently there is only one beep code in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes message for both the ISA and the EISA BIOS.

CMOS BATTERY HAS FAILED

CMOS battery is no longer functional. It should be replaced.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. Insert a system disk into Drive A: and press Enter. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

DISKETTE DEIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS

definition. Run Setup to reconfigure the drive type correctly.

DISPLAY SWITCH IS SET INCORRECTLY

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

EISA Configuration Checksum Error PLEASE RUN EISA CONFIGURATION UTILITY

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has configured incorrectly. Also be sure the card is installed firmly in the lot.

EISA Configuration Is Not Complete PLEASE RUN EISA CONFIGURATION UTILITY

The slot configuration information stored in the EISA non-volatile memory is incomplete.

***Note: When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. make sure the con-

troller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

Invalid EISA Configuration

PLEASE RUN EISA CONFIGURATION UTILITY

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

***NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

KEYBOARD ERROR OR NO KEYBOARD PRESENT

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

Memory Address Error at...

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

Memory parity Error at ...

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

MEORY SIZE HAS CHANGED SINCE LAST BOOT

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

Memory Verify Error at ...

Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

OFFENDING ADDRESS NOT FOUND

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

OFFENDING SEGMENT:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

PRESS A KEY TO REBOOT

This will be displayed at the bootom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

PRESS F1 TO DISABLE NMI, F2 TO REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

Should Be Empty But EISA Board Found PLEASE RUN EISA CONFIGURATION UTILITY

A valid board ID was found in a slot that was configured as having no board ID.

***NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Should Have EISA Board But Not Found PLEASE RUN EISA CONFIGURATION UTILITY

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

***NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Slot Not Empty

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

***NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Wrong Board In Slot

PLEASE RUN EISA CONFIGURATION UTILITY

The board ID does not match the ID stored in the EISA non-volatile memory.

***NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

6.2 Award BIOS Virus Warning Feature

The Award BIOS has a VIRUS WARNING feature. When the Virus Warning Feature is enabled, the Award BIOS will detect a virus during and after boot up. If any attempt is made to write to the boot sector or partition table of the HDD, the system will be halted, a beep will sound and a highlighted warning message will appear to warn the user. This usually indicates that a virus is trying to destroy the system.

However, if the user is in process of initializing the fixed disk he can ignore this message and press "Y" to continue the procedure.

Warning Beep And Message

The warning beep sound consists of 4 short beeps. The sound will continue until a key has been pressed.

The following is the highlighted warning message which appears whenever the BIOS detects a write to the hard disk boot sector or partition table. Note: That this message only appears in text mode. If your system is in graphic mode, there will only be the beep sound.

!!! WARNING !!!
Disk boot sector is to be modified
Type "Y" to accept write or "N" to abort write
Award Software, Inc.

The status of the Virus protection feature is seen as an Award BIOS informational message during POST and can be selected in the Award BIOS Setup.

Infomrational Messages

Figure below shows the messages that can be displayed during the POST. If any error is found by the POST, an error message will be displayed.

(<part number>) <BIOS message>

Sizing System Memory 640K Found
Sizing Extended Memory 1024K Found
Check 1st DMA Channel Passed
Check 2nd DMA Channel Passed
Check DMA Page Registers Passed
Check Time 2 Passed
Check 1st Interrupt Controller Passed
Check 2nd Interrupt Controller Passed
Check Unexpected Interrupts Passed
Check Interrupt Functions Passed
Check stuck NMIs Passed
Testing System Memory 640K OK
Testing Extended Memory at 1024K OK
Installing Mouse Passed
Internal (486) cache controller Passed
BIOS Shadow RAM Enabled
Video Shadow RAM Enabled

Virus Warning Feature Enabled

Installing Floppy Drives Passed
Installing Fixed Drives Passed

XXX Modular BIOS Vx.xx
Copyright (C) 1984-1992, Award Software, Inc.
TO ENTER SETUP BEFORE BOOT PRESS CTRL-ALT-ESC

If the Virus Warning Feature is set to disable, after POST is done, the following message appears in a box at the top of the screen.

VIRUS WARNING IS DISABLED
NO WARNING IF BOOT SECTOR IS TO BE MODIFIED
CHANGE SETUP TO ENABLE VIRUS WARNING

BIOS Setup

Status Page

Figure below is the Status page of Award BIOS setup, the Virus Warning can be selected by pressing + or - keys.

Date : 01 Jan 1991 Time : 00:00:00 Drive A : 1.2M, 5 1/4 in. Drive B : 1.4M, 5 1/4 in. Video : VGA/EGA Halt On : All Errors	XXXXX BIOS (1XXXXXXX) Award Software, Inc. Base Memory : 640K Extended Memory : 1024K Expanded Memory : 0K Other Memory : 384K Total Memory : 2048K																					
Cache : Disable Shadow : System Security : System Access	Boot Sequence : A, C Virus Warning : Enabled ←																					
<table border="1"> <thead> <tr> <th></th> <th></th> <th>CYLS.</th> <th>HEADS</th> <th>SECTORS</th> <th>PRECOMP</th> <th>LANDZONE</th> </tr> </thead> <tbody> <tr> <td>Drive C :</td> <td>10 (20Mb)</td> <td>820</td> <td>3</td> <td>17</td> <td>None</td> <td>820</td> </tr> <tr> <td>Drive D :</td> <td>35 (110Mb)</td> <td>1024</td> <td>13</td> <td>17</td> <td>None</td> <td>1023</td> </tr> </tbody> </table>				CYLS.	HEADS	SECTORS	PRECOMP	LANDZONE	Drive C :	10 (20Mb)	820	3	17	None	820	Drive D :	35 (110Mb)	1024	13	17	None	1023
		CYLS.	HEADS	SECTORS	PRECOMP	LANDZONE																
Drive C :	10 (20Mb)	820	3	17	None	820																
Drive D :	35 (110Mb)	1024	13	17	None	1023																
Alt-F1 for Menu Help Page 01: Status Page		PgDn = Options Page	F10 exit F2 change colors																			

Virus Warning

If the BIOS detects any attempt to write to the boot sector or partition table of HDD, the system halts during the Boot Procedure and the warning message displays on the screen only if the Virus Warning Feature is enabled.

Disable	System will not be stopped if BIOS detects a write to the boot sector or partition table of HDD. The <u>NO WARNING</u> message will be displayed.
Enable	Default value, is automatically set. When the BIOS detects a write to the boot sector or partition table of HDD, the system <u>will be stopped</u> and a highlighted warning message will be displayed.

APPENDIX A

CMOS Setup For AMI BIOS

When a JET 486 system first boots up, several messages will appear on the screen before the system software is accessed. These are generated by the BIOS.

They include:

- RAM Test
- BIOS version and BIOS initial code

If you press the ESC key, you will then see:

BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES (C)1990 American Megatrends Inc., All Rights Reserved
STANDARD CMOS SETUP ADVANCED CMOS SETUP ADVANCED CHIPSET SETUP AUTO CONFIGURATION WITH BIOS DEFAULTS AUTO CONFIGURATION WITH POWER-ON DEFAULTS CHANGE PASSWORD HARD DISK UTILITY WRITE TO CMOS AND EXIT DO NOT WRITE TO CMOS AND EXIT
Standard CMOS Setup for Changing Time, Date, Hard Disk Type, etc. ESC:Exit↓→↑← : sel F2/F3: Color F10: Save & Exit

The program displays a screen with a list of entries to be specified, use ↑, ↓ keys to move the cursor and press <Enter> keys to enter the setup screen.

STANDARD CMOS SETUP

BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITES (C) 1990 American Megatrends, Inc., All Rights Reserved							
Date (mn/date/year) :	Sun, Nov 11 1990	Base memory :	640 KB				
Time (hour/min/sec) :	13: 54: 42	Ext. memory :	3072 KB				
Daylight saving :	Disabled	Cylin	Head	WPcom	LZone	Sec	Size
Hard disk C: type :	47=User Type	0	0	0	0	0	0 MB
Hard disk D: type :	Not Installed						
Floppy drive A: :	1.2 MB, 5¼"						
Floppy drive B: :	Not Installed						
Primary display :	VGA/PGA/EGA						
Keyboard :	Installed						
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
	28	29	30	31	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
Month : Jan, Feb,..... Dec	18	19	20	21	22	23	24
Date : 01, 02, 03,..... 31	25	26	27	28	29	30	1
Year : 1901, 1902,..... 2099	2	3	4	5	6	7	8
ESC: Exit ↓ → ↑ ← : Select F2/F3: color PU/PD: Modify							

Fill in the time, date, your floppy and hard disk type, its import and to set the hard disk type correctly, so check the hard disk documentation if necessary they are 46 present choices and 47th for user specified parameters.

AUTO CONFIGURATION WITH BIOS DEFAULTS

The Setup for ADVANCED CMOS and ADVANCED CHIPSET Setup parameter will be set by recommend parameter.

AUTO CONFIGURATION WITH POWER-ON DEFAULTS

The Setup for ADVANCED CMOS and ADVANCED CHIPSET Setup parameter will be set by worst case parameter.

APPENDIX B:

APPLICATION NOTE:

DATA RAM & TAG RAM Speed

- * For 486DX-33MHz & 486DX2-50MHz on the board DATA RAM use 25nS & TAG RAM USE 20nS. But if the condition is 128KB Cache, the DATA RAM should be used 20nS & TAG RAM use 15nS-17nS.
- * For 486DX-50MHz the on board DATA RAM use 20nS & TAG RAM use 15nS-17nS.

BIOS Set Up

- * For 486DX-33MHz : AT BUS clock selection : CLKI/4
Cache Read Wait State : 1 W/S
Cache Write Wait State : 1 W/S
- * For 486DX-50MHz : AT BUS clock selection : CLKI/6
Cache Read Wait State : 1 W/S
Cache Write Wait State : 1 W/S
- * For 486DX2-50MHz: AT BUS clock selection : CLKI/3
Cache Read Wait State : 1 W/S
(set up to 1 W/S when install 128KB Cache Memory)
Cache Write Wait State : 0 W/S

