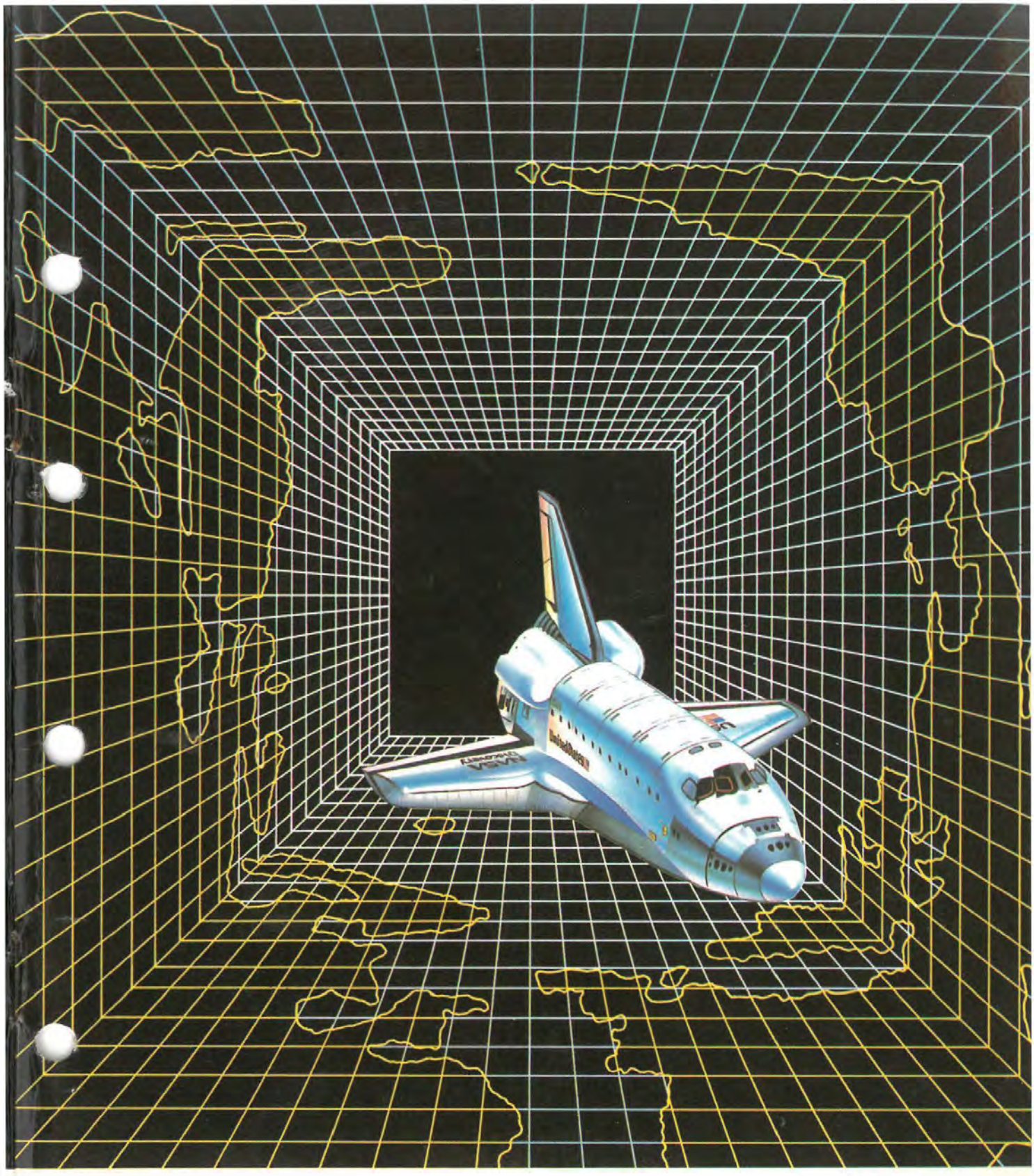

HOT-304
OPTi 386™-25 Main Board
User's Manual

HOT-304

OPTi 386 - 25

MAIN BOARD

USER'S MANUAL

MANUAL VERSION 2.01

PREFACE

This manual is designed to provide the basic information necessary for the end users to understand and properly use of the HOT-304 main board. It also contains the information necessary to set up more complex configurations and/or upgrade a 80386DX based system.

We hope that this manual will provide all the information that you will need to operate your system. Your comments and suggestions will help us in our continuous effort to improve the quality. However should you require any further information, please contact your dealer who will be pleased to assist you.

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CHAPTER 1

QUICK SERVICE

Before you install the HOT-304 in your computer system. You need to make certain settings on the board by means of the jumper switches. These jumper switches enable you to configure the board according to your own requirements, the jumper settings in order to ensure that the HOT-304 works to your satisfactions.

What Is A Jumper Switch

A jumper switch consists of two or more pins and a plastic slider, called a jumper, which fits over these pins. With a two pin jumper, when the jumper is in position over the two pins, the switch is CLOSE; when the jumper is removed from those two pins, the switch is OPEN. With a three pin jumper, two settings are possible. When the jumper is over pin 1 and 2, one setting is achieved; and when the jumper is over pin 2 and 3 another setting is achieved. If you wish to set a two pins jumper as OPEN, just remove the jumper, and push the jumper over pin 1 in order to aviod losing it.

Some jumper switches have no jumper and function as connectors to which you should attach an external jumper which will usually be connected to an indicator,such as the turbo LED.

Setting The Jumper Switch

The functions of the jumper switches:

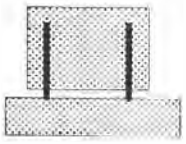
JP1. . . . . .Display Adapter Selection

The functions of the jumper connectors:

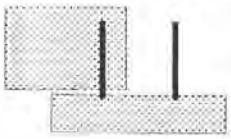
J10 . . . . . .External Battery Connector
J23. . . . . .KeyLock/Power-on LED
J22. . . . . .Speaker Connector
CR4. . . . . .Turbo LED Connector
SW1. . . . . .Reset Switch Connector
SW2 . . . . . Turbo Switch Connector

JP1 is used to configure the system for a color or a monochrome monitor. If you have a color monitor make sure the jumper is closed. If you have a monochrome one, set JP1 opened.

COLOR

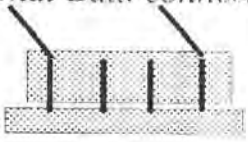


MONOCHROME

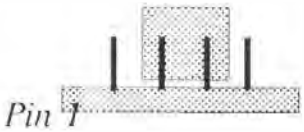


J10 is an external battery connector. If you wish to connect a battery pack to it, plug the jumper to the connector, there should be a red wire attached to the jumper, make sure the edge of the jumper with red wire is plugged in the pin marked 1.

External Batt. connected

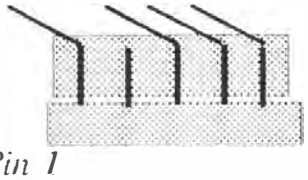


Internal Batt.



J23 is a keyLock and Power LED connector. If there have a KeyLock and power indicator on your system case, it will be a five wires jumper from the case panel, and the second wire is an empty one . When you plug the jumper in the connector, make sure that the jumper with red wire is pushed over the pin marked 1.

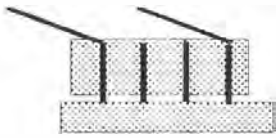
KeyLock/Power on LED



J22 is a speaker connector. Most cases have a small speaker built-in, and a four wire jumper (the middle of two are empty) attached which first wire is red colored one.When you plug the jumper in the connector, make sure the jumper with red wire is pushed over the pin marked 1.

Speaker Connector

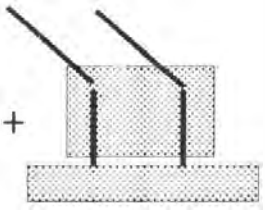
Pin 1



CR4 is a Turbo LED connector. If you have a turbo indicator on system case panel,connected the jumper which attached to the indicator to CR4 connector.

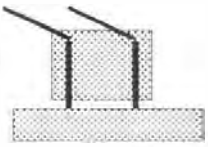
Turbo LED Connector

Pin +



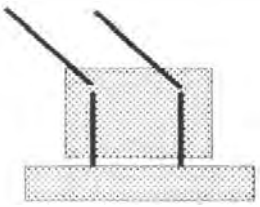
SW1 is a Reset switch connector. If there have a push button switch on your case panel, connect the jumper which attached to the switch to SW1 connector, to reboot the system whenever you need.

Reset Switch Connector



SW2 is a Turbo switch connector.If there have a puch button of turbo switch on your case panel, connect the jumper which attached to the switch to SW2 connector, to operate the system on the lower speed or at the turbo speed.

Turbo Switch Connector



NOTE:

CHAPTER 2

INTRODUCTION

The HOT-304 main board is a high performance AT-compatible main board that provides the simple logic in order to achieve the advanced personal computer. It is a high performance and high enhanced function board that offers the primary elements for building more advanced system.

Full downward compatibility is provided with previous IBM AT and XT models, so all you will be able to run all your existing MS-DOS compatible software but at a greatly faster speed. In addition you can also run OS/2,UNIX. The AMI BIOS used on the HOT-304 system provides true compatibility with all peripherals designed for IBM hardware, and features of an extended setup capability and built in hard disk utilities to allow you to easily configure your system.

Main Features

The system board offers the following advanced features:

* Supporting system runs up to 25 MHz.

* Up to 8-MB of local high-speed,page-mode DRAM capacity on-board.

* Optional caching of Shadowed System ,Video and Adaptor BIOS.

* DRAM Read/Write wait stste selectable from 0 to 3 wait state.

* 8042 emulation for fast CPU-reset and gate A20 generation.

* Hardware turbo switch for high or low speed selectable.

* Socket for optional 80387 Co-processor.

* AMI BIOS support.

* Eight expansion slots, six for 16-bits, one for 8-bits, and one for 32-bits expansion memory card.

* Baby Size design ,Mechanically fit any baby AT or XT cases.

System Performance

SPEED (MHZ)	POWER METER MIPS(V.1.30)	SI (V.4.5)	LANDMARK MHZ (V.1.14)
25	4.424	27.80	34.7

CHAPTER 3

INSTALLATION GUIDE

If your HOT-304 M/B is not installed in a computer system ,then the following basic information will be useful. Due to the wide variety of case the HOT-304 can be installed in, it is not possible to provide exact installing instructions for every case. This section covers the common factors for installing the board in most situations.

The HOT-304 main board has mounting holes that accommodate the standard mounting points for the IBM PC/XT,PC/AT and compatible variation of them. Before removing the board from its anti-static bag, read the section below for static electricity precautions.

Static Precautions!!

Static electricity is a constant danger to computer system. The charge that built up in your body may be more than sufficient to damage integrated circuits on the system board . It is therefore important to observe the basic precautions whenever you are going to handle or use computer components.

Although areas with a humid climate are much less prone to static build-up, it is better to alway safeguard against accidental damage that may be result in expensive repairs . The following measures are generally sufficient to protect your equipments from static discharge:

* Discharge any static electricity that may have built -up in your body by touching a grounded(earthed) or anti-static pad is one example. If there is nothing else, touch the silver expansion slot covers at the left rear of the unit case before opening the case,and the power supply.

* Avoid any contact with the components on the individual cards , boards or modules ,especially the "golden finger" plugged into the expansion bus, when you handle them. It is better to handle the system components either by there edges or by the mounting bracket that attaches to the slot opening in the case.

In following the above recommendations,it is not necessary to be excessively cautions. They are just for taking reasonable care.

Always make certain that everything connected to the system case, including the power supply is unplugged before doing the installation.

Installing SIMM DRAM

The HOT-304 mother board accepts 256k,1M of high speed page-mode single in line memory modules (SIMM).You can expand the system memory from 1 MB to 8 MB.

On the system board,DRAM is located in eight rows of SIMMs.It combines different SIMMs on the system board to obtain the desired amount of RAM(from 1 MB to 8 MB).

Notice !!

Before installing DRAM on the HOT-304 M/B you will notice that they are labeled U35, U36, U37, U38 (Bank 0). U31, U32, U33, U34 (Bank 1), and both Bank 0 and Bank 1 may use the modules of 256K*9, 1M*9 or 256K*8, 1M*8.

Bank 0	U35, U36, U37, U38
Bank 1	U31, U32, U33, U34

BANK 0	BANK 1	TOTAL
256K	none	1M
256K	256K	2M
1M	none	4M
256K	1M	5M
1M	256K	5M
1M	1M	8M

External Connections

Most system cases have some controllers and indicators built on the front of the case, and have a speaker mounted somewhere inside . As mentioned in connection to the above indicators. In addition, the system power supply leads must be connected to the board.

Case Connections

After installing the HOT-304 main board in a system case, you can connect the case connectors before closing the case.

If the wire leads from the front panel are not labelled, you can identify them by tracing the wire back to see which control or indicator is attached to. Refer to the chapter 1 for more detail information.

Power Supply Connections

The location of the power supply connectors; two connector strips mounted side by side. These actually look as if they are one piece but they are not. A system power supply will have two board leads with six wires each extending from the supply . These leads, although they are not often marked, are easy to be distinguished. They will be shorter, and have a different connector than the drive power leads (usually there are four) which have only four wires.

To connect the power leads , as you plug them on , orient the two connectors so that the black wires from each are toward inside, abutting each other. The connectors will only plug on this way.

Installing The Co-processor

The HOT-304 M/B provides a PGA socket (U30) of Intel 80387/Weitek 3167 numeric coprocessor for speed up the floating-point intensive software applications .When adding this chip ,please follow the procedure:

1 The inside of the coprocessor socket has one cut off corner contains pin 1.The pin 1 position of 80387/3167 is indicates the same as. The cut off coner of 80387/3167 should be oriented so that it can match the cut off corner of the coprocessor socket.

2 Insert the chip gently and firmly in the socket.

AMI BIOS Setup

The following pages are the CMOS setup table references. The contents of setup can be modified by the user from the setup screen to follow the instructions step by step.

BIOS SETUP PROGRAM

CMOS setup table references was written to assist you in the proper usage of BIOS setting, please take a few minutes to review the references to using the program.

BIOS SETUP UTILITIES

When your system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. The routines include two phases:
System Test and Initialization - test initilize system boards for normal operations

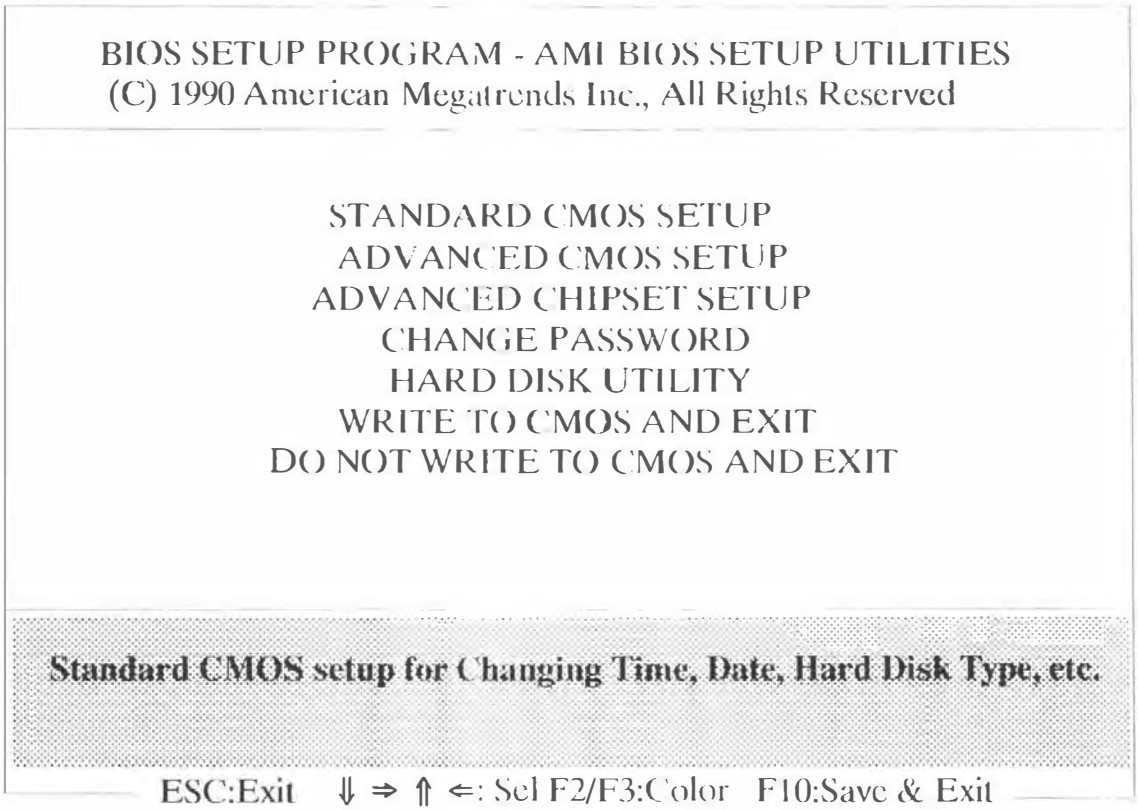


Fig 1-1

System Configuration Verification - compare defined configuration with hardware accually installed.

After POST routines are completed, the following message displays:

" Hit < DEL > if you want to run SETUP "

If you want to access the BIOS SETUP program, press the < DEL > key immediately, the screen in Fig 1-1 will be displayed:

System BIOS is a record of the system parameters, such as amount of memory, video display adaptors, numeric coprocessor, disk drives, is stored in the CMOS memory. When the system is turned off, a back-up battery retains the parameters in the CMOS memory.

Each time the computer is turned on, it is configured with these parameters, and make it available. The BIOS SETUP program is resident in the ROM BIOS (On HOT-304 chip U17).

Listed below is an explanation of the keys displayed at the bottom of the screens accessed through the BIOS SETUP program:

ESC: Exit to previous screen.

ARROW KEYS: Use arrow keys to move cursor to desired selection.

PU/PD: Modify the default value of the options for the highlighted feature.

F1: Displays help screen for selected feature.

F2/F3: Changes background and foreground colors.

F5: Retrieves the values which were resident when current setup session was started.

F6: Loads all features in the Advanced CMOS Setup/Advanced Chip Set Setup with BIOS Setup defaults.

F7: Loads all features in the Advanced CMOS Setup/Advanced Chip Set Setup with the Power-On defaults.

F10: Saves all changes made to Setup and Exit program.

STANDARD CMOS SETUP

Let the highlighted bar stayed at STANDARD CMOS SETUP item then press <ENTER> , a warning message will be displayed (Fig 1-2). Warning message is displayed each time the Standard CMOS Setup, Advanced CMOS Setup and Advanced Chip Set Setup is selected.

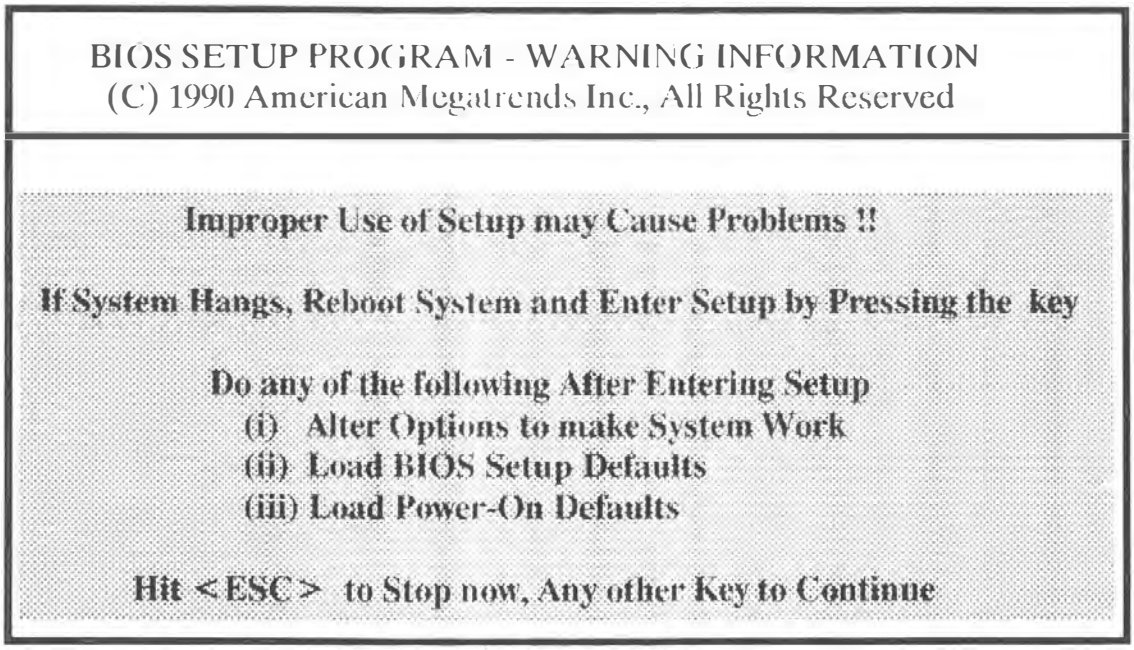


Fig 1-2

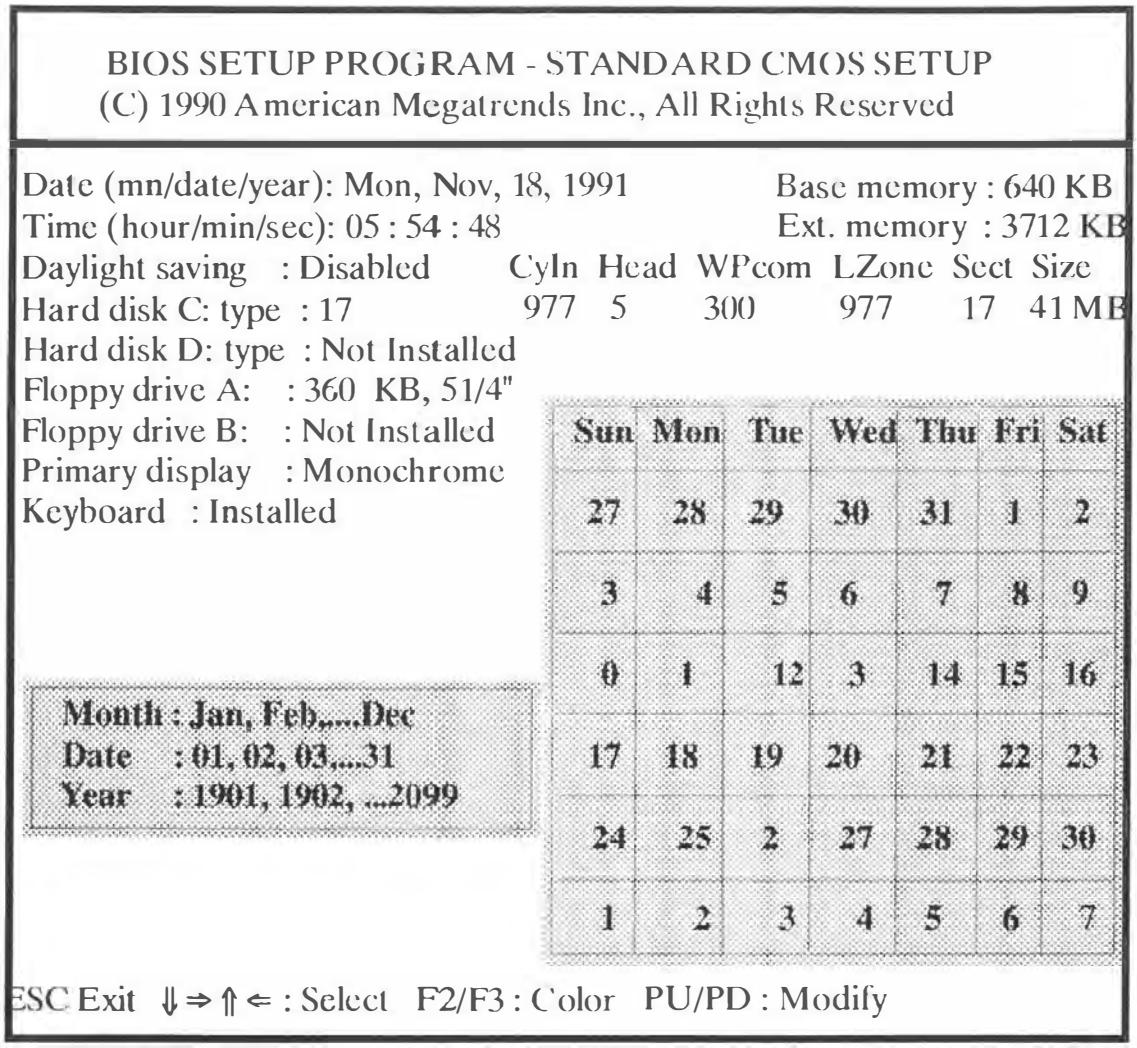


Fig 1-3

Standard CMOS Setup is the first option on the main setup menu. The Standard CMOS Setup Utility is used to configure the following features:(Fig 1-3)

Date - Month, Date, and Year. Ranges for each value are listed below in prompt box in the lower left corner.

Time - Hour, Minute, and Second. Uses 24 hour clock format.

Daylight Savings - Disabled or Enabled.

Hard Disk C and Hard Disk D - Hard disk types from 1 to 46 are standard types, type 47 is user definable. User must enter the proper parameters for each drive.(Please make reference on Appendix B).

Floppy drive A:/B: - The options are 360KB, 1.2MB 51/4", and 720KB, 1.44MB 31/2", and Not installed.

Primary Display - The options are Monochrome, Color 40x25, VGA/PGA/EGA, Color 80x25, and Not installed.

Keyboard - The options only are Installed or Not installed.

ADVANCED CMOS SETUP

The Advanced CMOS Setup is the second option on the main setup menu.

Let the highlight bar stayed at ADVANCED CMOS SETUP and press <enter> twice , the screen of Fig 1-4 will display.

Typematic Rate Programming - By enabling this option, user may adjust the rate at which a keystroke is repeated.The next two options "Typematic Rate Delay" and "Typematic Rate" affect this rate.
Typematic Rate means when a key is pressed and held down, the character displays on the screen and after a delay set by the Typematic Rate value, it keep on repeating at a rate set by the Typematic Rate value.

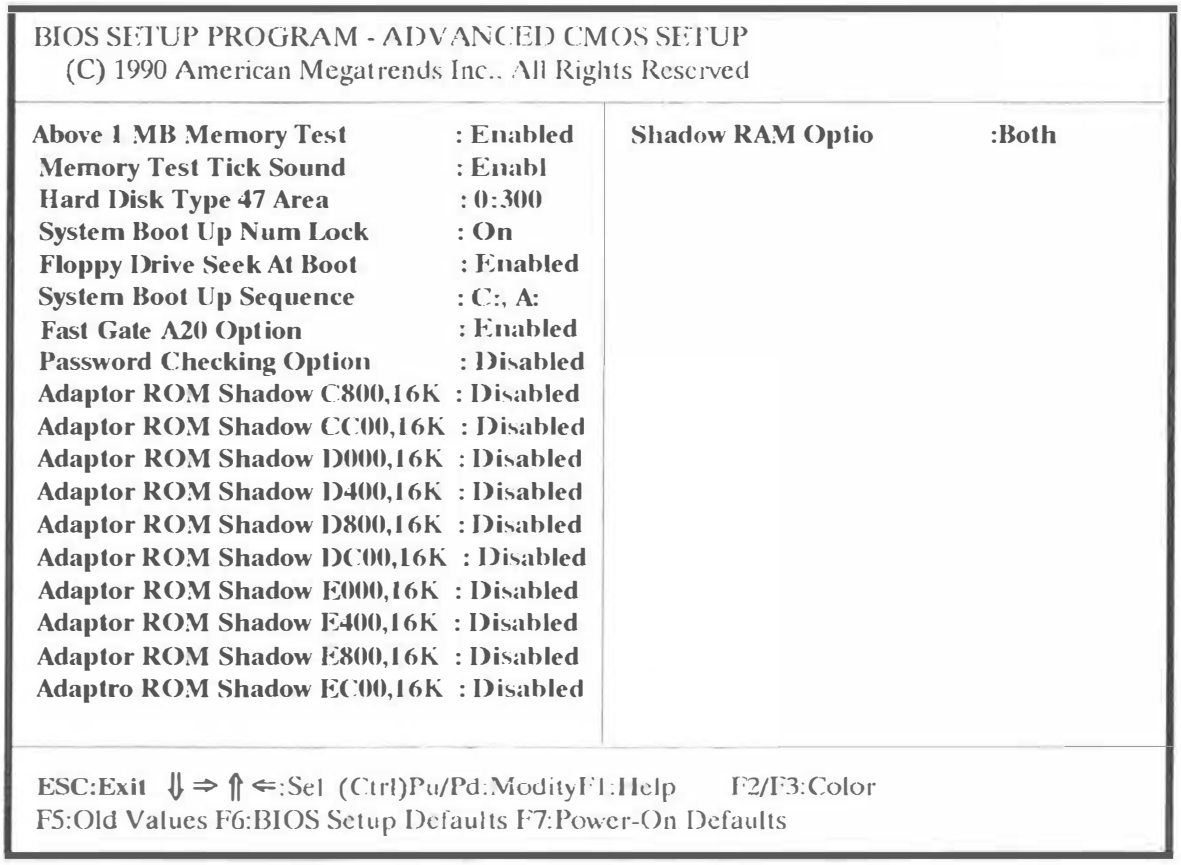


Fig 1-4

Hit <DEL> Message Display - By enabling this option, will make the message "Hit <DEL> if you want to run SETUP" appearing on the screen whenever the system boots-up.

Hard Disk Type 47 Data Area - The BIOS SETUP features two user-definable hard disk types. Normally, the data for these disk types are stored at 0:300 in lower system RAM. If a problem occurs with other software, this data can be located at the upper limit of the DOS shell (640 KB). If the option is set to "DOS 1 KB", the DOS shell is shortened to 639 KB, and the top 1 KB is used for the hard disk data storage.

System Boot Up Num Lock - When this option is turned on, it may allow user to use the numeric key on the Enhanced Keyboard numeric keypad when the system is powered on.

for the hard disk data storage.

System Boot Up Num Lock - When this option is turned on, it may allow user to use the numeric key on the Enhanced Keyboard numeric keypad when the system is powered on.

Numeric Processor Test - This option allow user to set the numeric processor enable or disable.

Weitek Processor - These options allow the user to indicate the BIOS whether the system present or absent a Weitek Processor.

Floppy Drive Seek At Boot - This option enable or disable seeking floppy drive A: when system boots-up. Disable it to allow a fast boot and to decrease the possibility of damage to floppy drive heads.

System Boot Up Sequence - If the option is set to "C:,A:", the system will attempt to boot from hard disk drive C:, and then A:. If the option is set to "A:,C:", the sequence is reversed.(Note:"A:,C:" must match the Enabling of Floppy Drive Seek At Boot)

Fast Gate A20 - All RAM access above 1 MB is handled through the keyboard controller chip. By enabling this option will make the access faster than the normal method.

Password Checking Option - The password checking feature can be used to prevent unauthorized system boot-up or unauthorized use of BIOS SETUP. There are three option in this item, "Disabled": means the prompt for the password will not appear when the system is re-booted, "Always": every time the system is turned on, the system will demand for password input, "SETUP": the password prompt will appear only user attempts to enter the Setup program.

Adaptor Rom Shadow xxxx, 16K - ROM shadow is procedure in which BIOS code is copied from slower ROM to faster RAM. Each option allows for a segment of 16 KB to be shadowed from ROM to RAM, if these options is enabled.

Shadow RAM Option - In this item available options are "Disabled", "Video", "Main", "Both". The same concept applies here as above. If you chose "Both", then Main and Video will be shadowed. Setting "Main", system BIOS will be shadowed, and "Video" will shadow the Video ROM in RAM instead.

ADVANCED CHIPSET SETUP

This program of the BIOS Setup is entirely chip set specific, and is used to change the register values for the chip set register. These registers control most of the system options in the computer. By using arrow keys make highlight bar stayed in ADVANCED CHIPSET SETUP then press <ENTER>. The screen in Fig 1-5 will display.

ATCLK Stretch - By enabling this function, an AT Bus cycle can be extended by stretching the AT Bus clock (ATCLK); default is "disabled".

BUS Clock Selection - The ATCLK Select is speed of system AT BUS, user may select CLKIN/2 , CLKIN/3 or CLKIN/4.

DRAM Read Wait State - This feature allows the user to select from zero read wait state to three read wait states for memory controlled by the chip set.

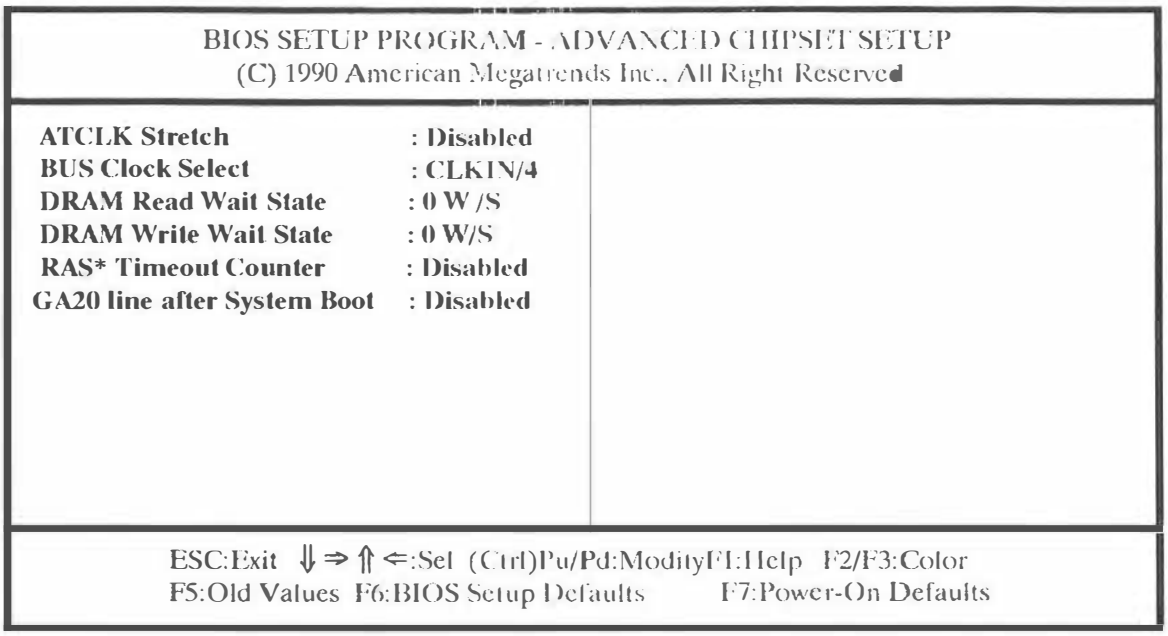


Fig 1-5

DRAM Write Wait State - This feature allows the user to select from zero write wait state to three write wait states for memory controlled by the chip set.

RAS* Timeout Counter - This precharge counter is usually be enabled.

GA20 Line After System Boot - Normally on the main board all RAM access above 1 MB is handled through the keyboard controller chip (8042). By enabling this option will make the access faster than the normal method. This option is useful in networking operation system and OS/2.

CHANGE PASSWORD

The BIOS SETUP program has a optional password features. The password function may be "disabled"; or setting "SETUP", whenever an attempt is made to enter the SETUP program; or "ALWAYS", every time the system boots, the user is required to enter a password.

The password, which will be stores in the CMOS, may not exceed six characters in length. A default password, to be used if the CMOS is corrupted, is stored in the ROM, is <AMI>.

To change the user password, at first user must Enable the Password Checking Option in the program of ADVANCED CMOS SETUP, then by using the arrow keys to move the cursor to CHANGE PASSWORD and pressing <ENTER>. The screen in Fig 1-6 will display.

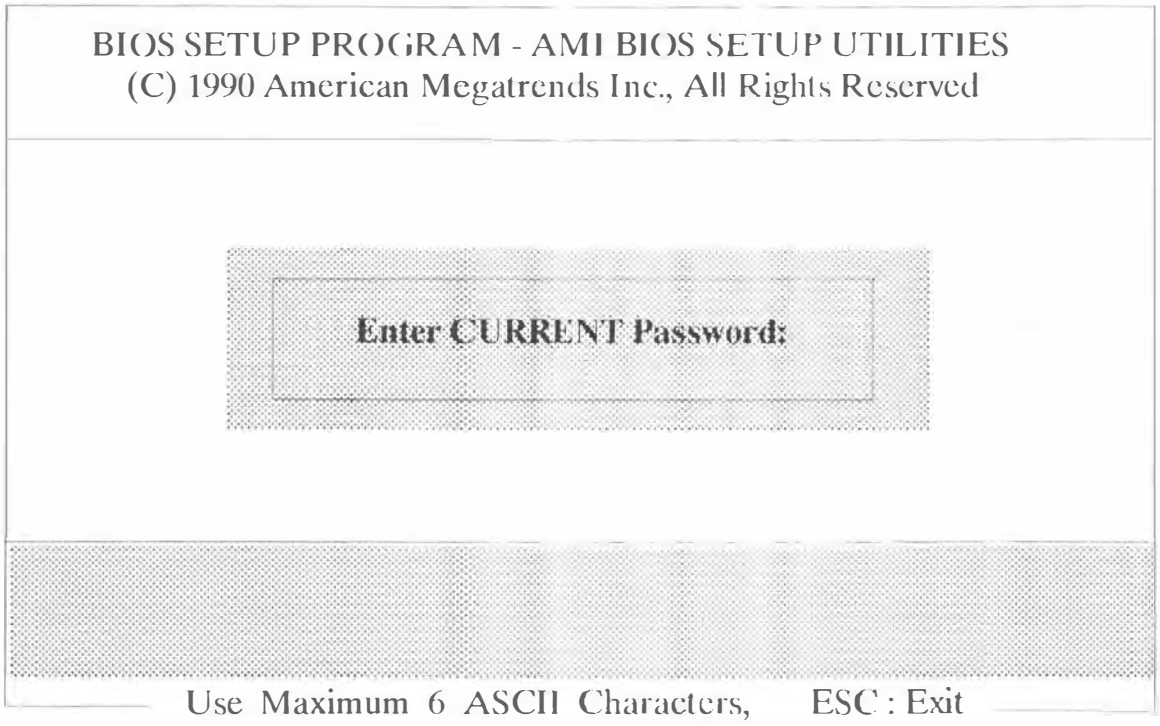


Fig 1-6

If user didn't Enable the Password Checking Option in ADVANCED CMOS SETUP, The screen in Fig 1-7 will display.

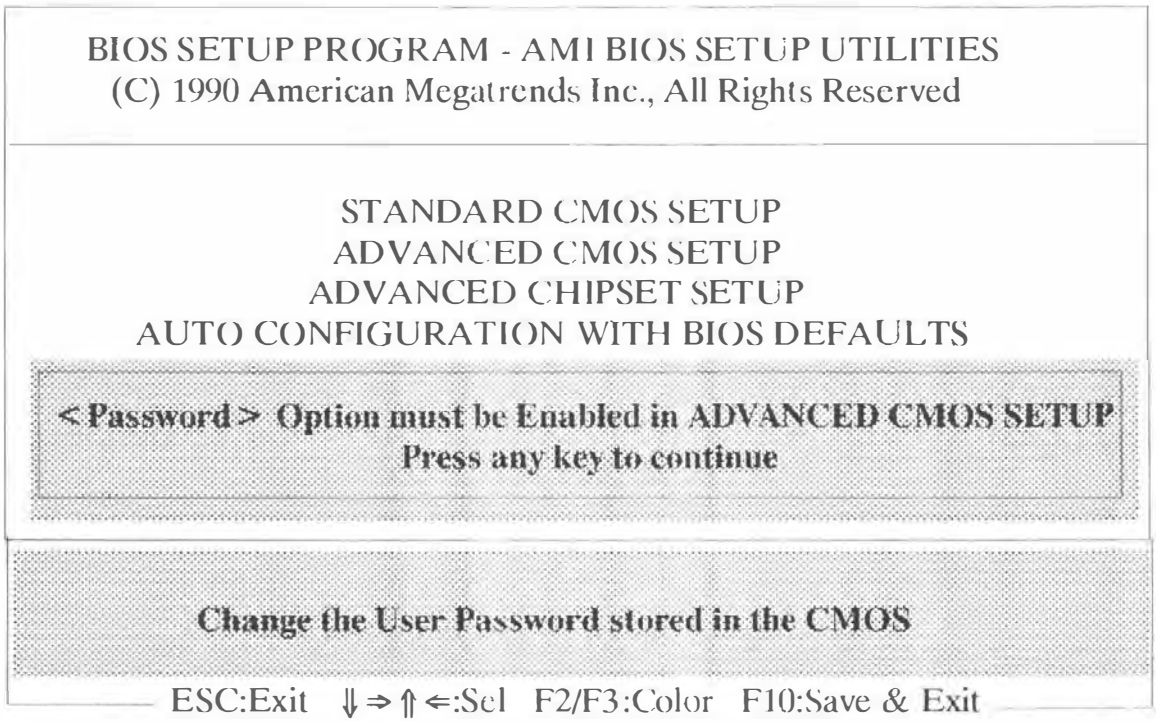
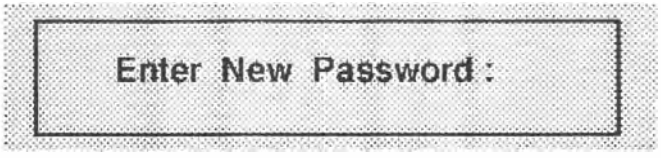


Fig 1-7

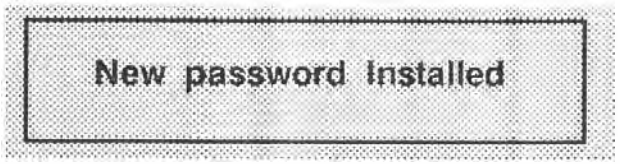
The first time you select this option, enter the default password < AMI >, then press < ENTER > to complete your selection.

The screen may not display the characters entered. After the current password has been correctly entered, the demand in middle block of Fig 1-6 will show as below:

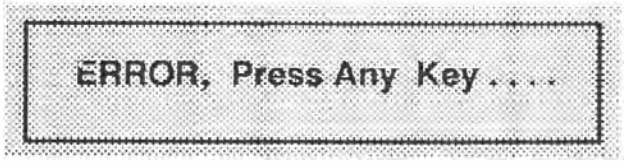


By keying the new password, the BIOS will demand the user to rekey the new password, the demand show as below:

If entered without error, the message will appear as below:



But if the password confirmation is miskeyed, the error message will appear be below:



NOTICE: When the Password Checking function is enabled and password is changed, it is important that a record of the password be kept in safe place.

HARD DISK UTILITY

NOTICE: These routines are not valid for a SCSI Disk Drive.

WARNING !!

Performing the Hrd Disk Format, Auto Interleave, and Media Analysis will destroy any data on the hard disk being stored.

HARD DISK FORMAT UTILITY

This utility use to format a new hard disk, or to reformat a used hard disk which has developed some bad tracks. For finding bad tracks on a hard disk drive, user may refer the information provided by manufacturer or select the Media Analysis option.

When you press < ENTER > at the Hard Disk Format option, (Fig 1-8) the screen as follow will display : (Fig 1-9)

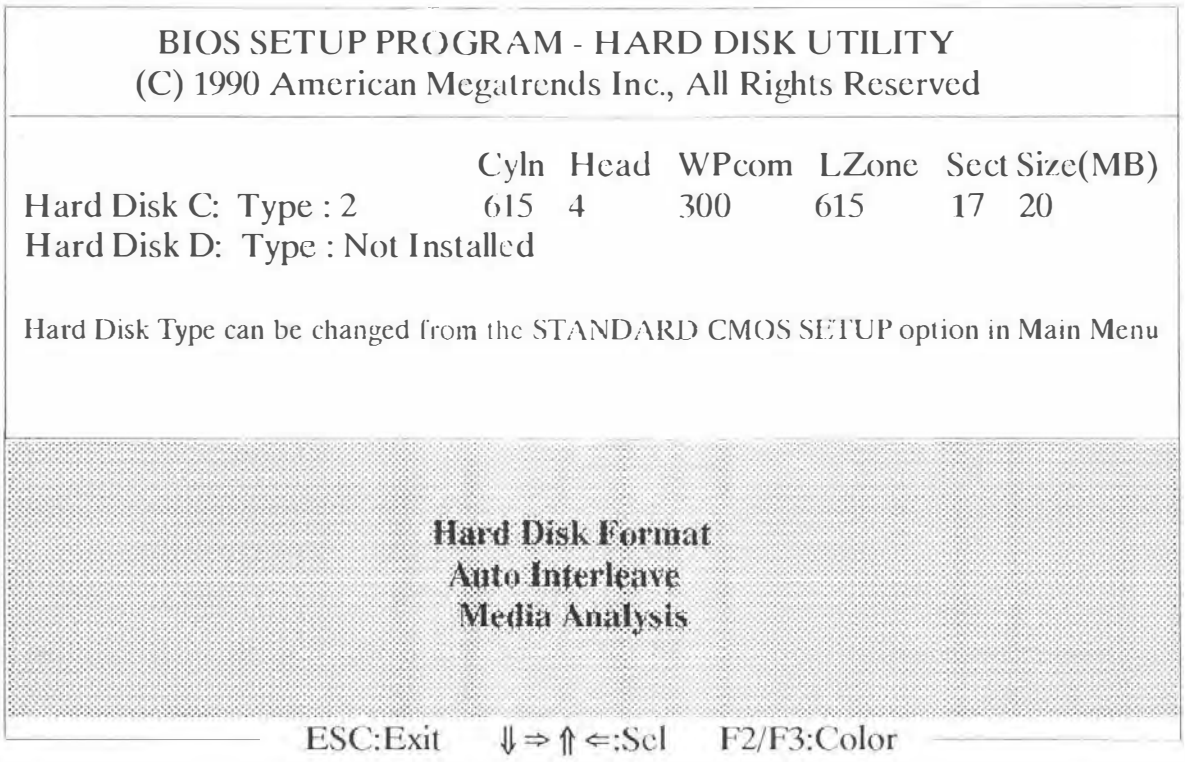


Fig 1-8

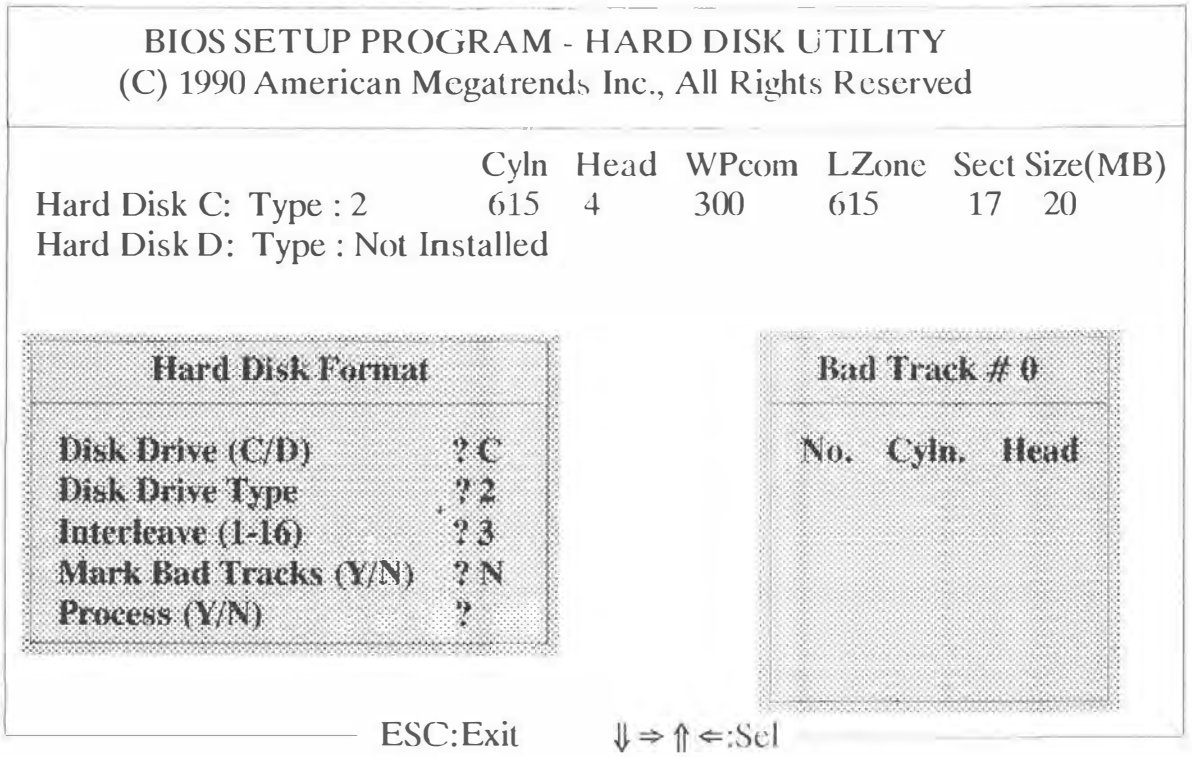


Fig 1-9

The window on the left side of the screen contains a list of questions, if user only one Hard drive was selected at the Standrad CMOS Setup, the cursor will automatically be stayed at the interleave prompt, if doesn't , the user must be answered the questions step by step.

1. The value for Disk Drive is C for a C: Drive and D for a D: Drive.

2. The Disk Drive Type is load from the CMOS.

3. The Interleave factor can be selected manually, or can be determined with the Auto Interleave feature of the SETUP program.

4. Bad tracks are areas of the hard disk which cannot store data properly. These bad tracks should be entered, and mark it as "bad" in order to prevent data from being stored.

When prompt to Mark Bad Tracks is setted to <Y> and press <ENTER>, an option to add, delete, revise, or clear is selected from the Bad Track Edit Menu.

5. This is the last chance to determine whether the user want to continue the process or not. If do, change the prompt to <Y> and press <ENTER>. If user want to negate it, press <ENTER> directly and back to previous window, or press <ESC> to exit to Hard Disk Utility screen.

Auto Interleave Utility

The Auto Interleave utility calculates the optimum interleave value through trial and error by measuring the transfer rate for four different interleave values.

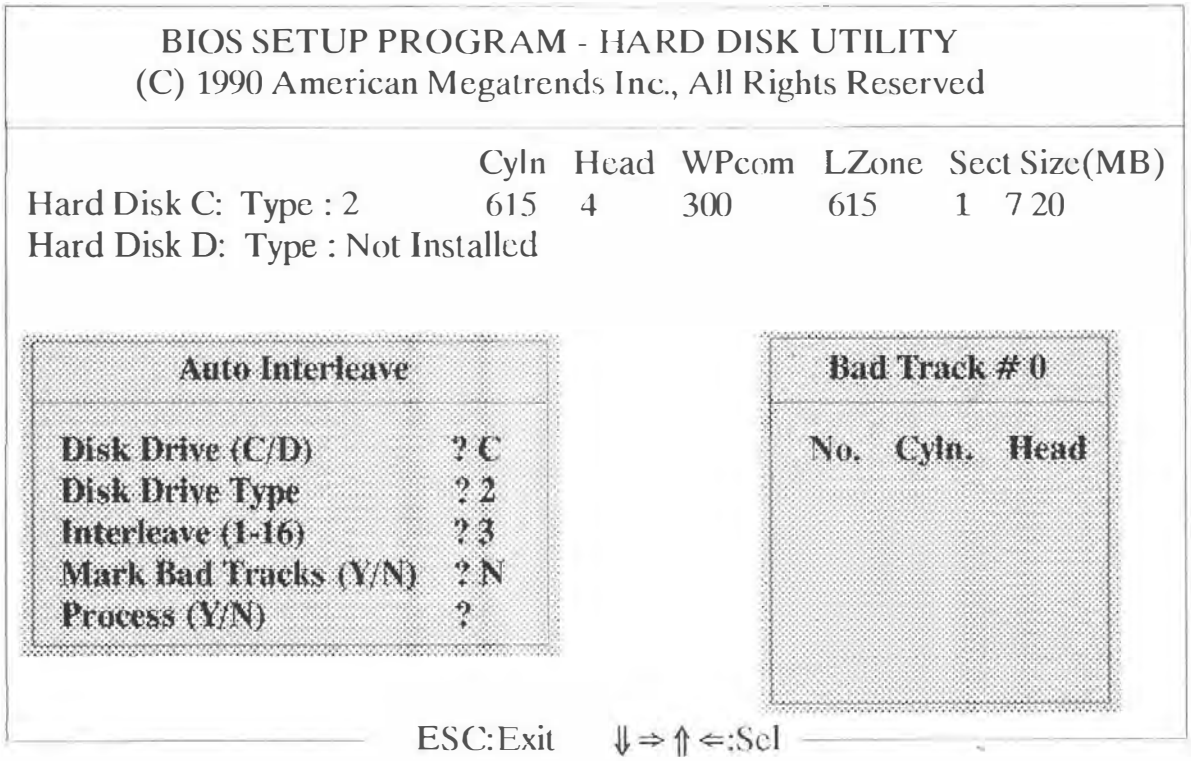


Fig 1-10

To determine the best interleave factor, the system will format a portion of the hard disk for each transfer rate calculated. The cylinders, heads and sectors formatted for each value will be displayed in the activity windows on the screen.

The procedure of Auto Interleave Utility mostly same as Hard Disk Format, except miss out the step 3.

Media Analysis

The Media Analysis Utility performs a series of tests to locate bad tracks on the hard disk, and lists them in the Bad Track List Window. Since this test writes to all cylinders and heads on the hard disk to verify any bad tracks, the test may require several minutes to complete.

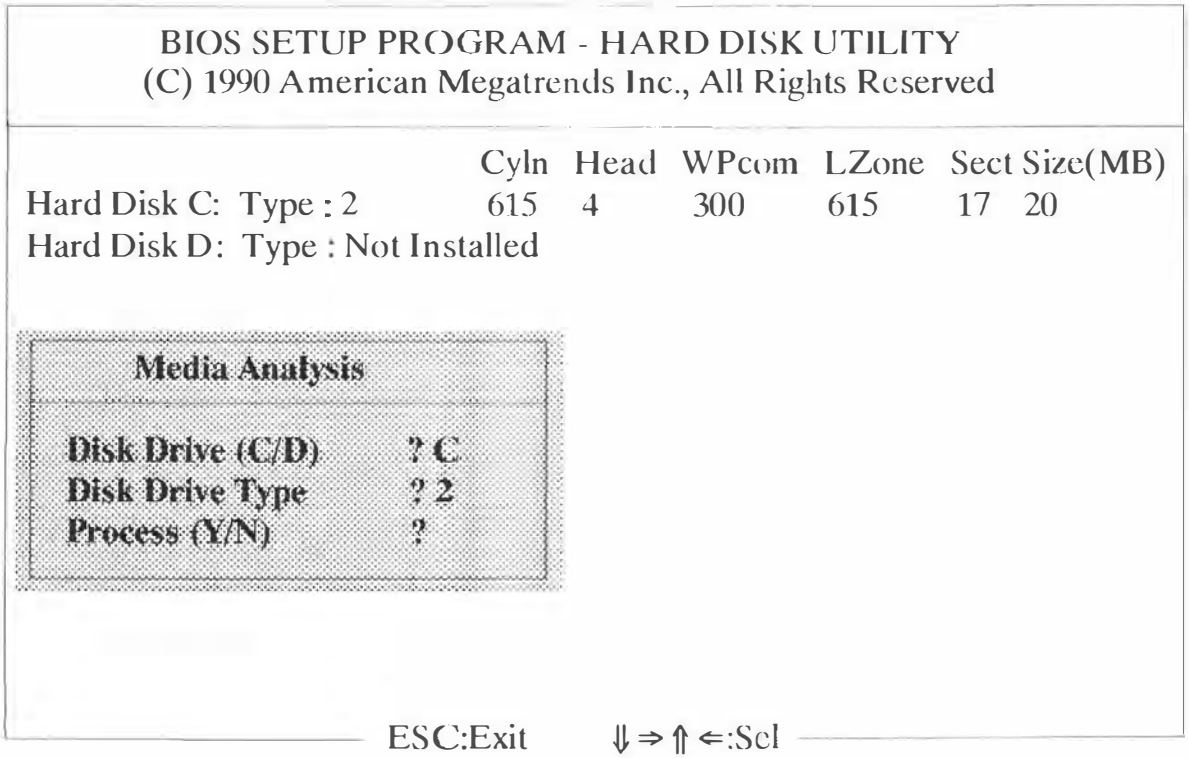


Fig 1-11

WRITE TO CMOS AND EXIT

The features configured in the STANDARD SETUP, ADVANCED CMOS SETUP, ADVANCED CHIPSET SETUP, AND NEW PASSWORD SETUP will be stored in the CMOS when this selection is taken. (fig 1-12)

Pressing < Y > and < ENTER > will save the system parameters and back into the booting process.

pressing < ESC > or < ENTER > will stay at the BIOS SETUP UTILITY screen.

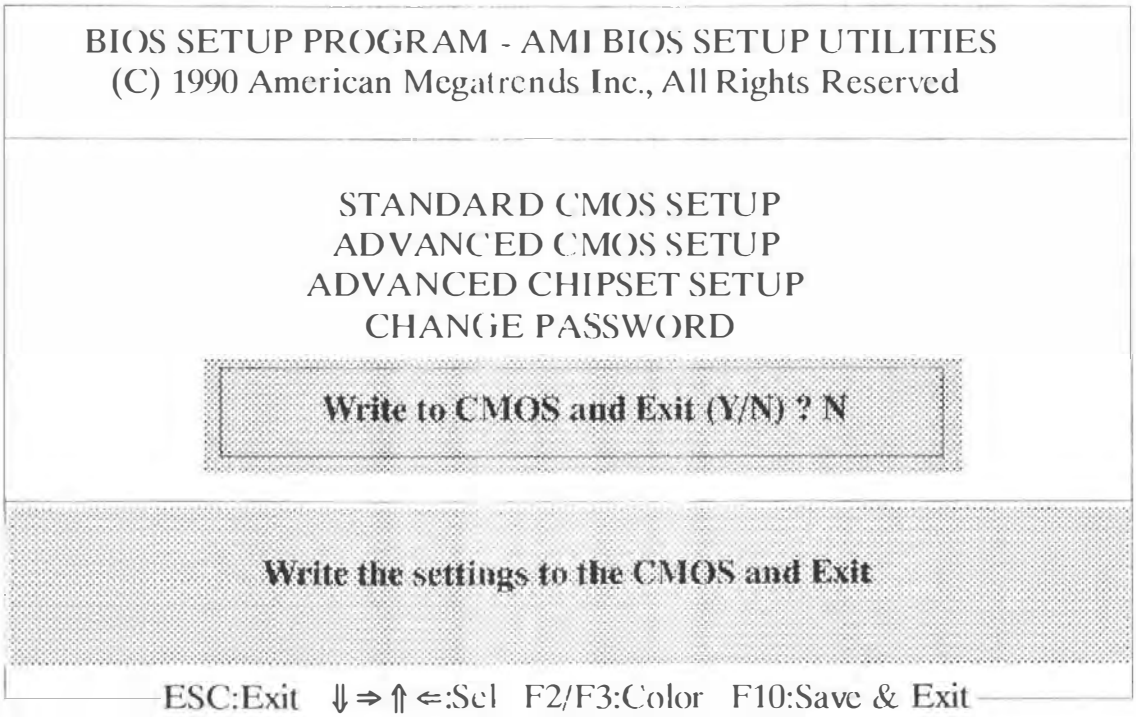


Fig 1-12

DO NOT WRITE TO CMOS AND EXIT

This selection passes control back to BIOS without save any changes to the CMOS. (Fig 1-13)

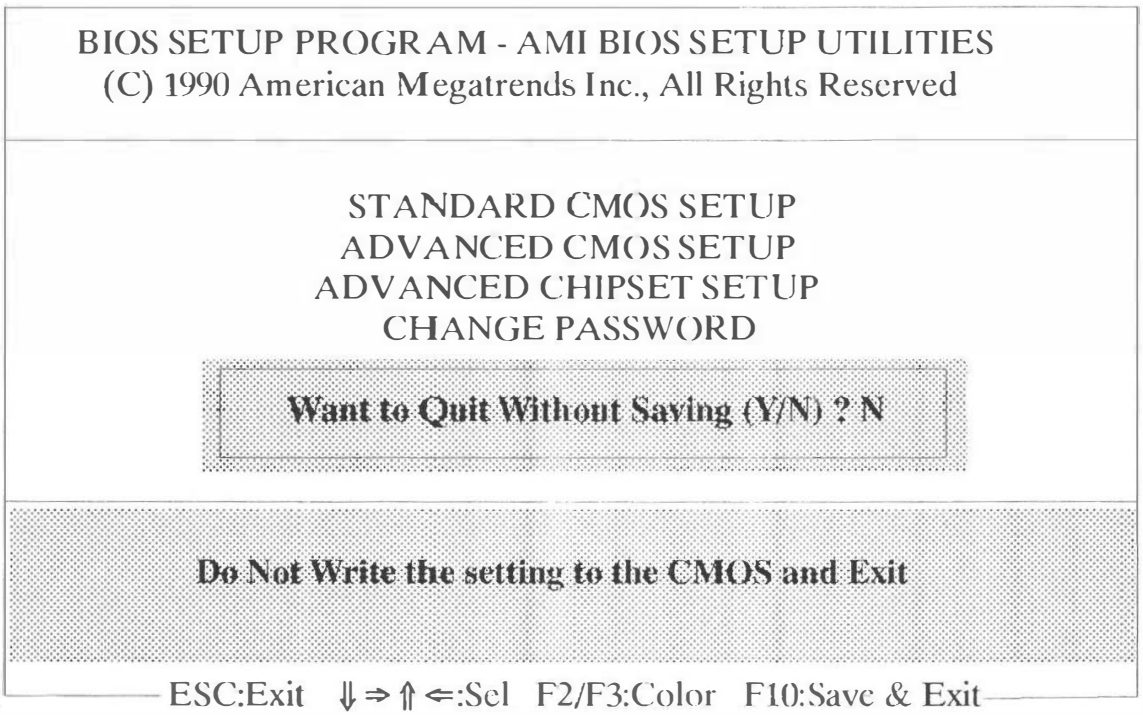


Fig 1-13

Hard Disk Drive Parameter Table (1)

TY	CY	HD	ST	LZ	WP	SZ	TY	CY	HD	ST	LZ	WP	SZ
1	306	4	17	305	128	10	16	612	4	17	663	0	20
2	615	4	17	615	300	20	17	977	5	17	977	300	41
3	615	6	17	615	300	31	18	977	7	17	977	-1	57
4	940	4	17	940	512	62	19	1024	7	17	1024	512	60
5	940	6	17	940	512	47	20	733	5	17	732	300	30
6	615	4	17	615	-1	20	21	733	7	17	732	300	43
7	462	8	17	511	256	31	22	733	5	17	733	300	30
8	733	5	17	733	-1	30	23	306	4	17	336	0	10
9	900	15	17	981	-1	112	24	925	7	17	925	305	54
10	820	3	17	828	-1	20	25	925	9	17	925	300	69
11	855	5	17	855	-1	35	26	754	7	17	754	-1	44
12	855	7	17	855	-1	50	27	754	11	17	754	-1	69
13	306	8	17	319	-1	28	28	699	7	17	699	-1	41
14	733	7	17	733	-1	43	29	823	10	17	823	-1	68
15	< Reserved >						30	918	7	17	918	-1	53

Hard Disk Drive Type Parameter (2)

TY	CY	HD	ST	LZ	WP	SZ	TY	CY	HD	ST	LZ	WP	SZ
31	1024	11	17	1024	-1	94	39	987	7	17	987	-1	57
32	1024	15	17	1024	-1	128	40	820	6	17	820	-1	41
33	1024	5	17	1024	-1	43	41	977	5	17	977	-1	41
34	612	2	17	612	128	10	42	981	7	17	981	981	41
35	1024	9	17	1024	-1	77	43	830	10	17	830	512	48
36	1024	8	17	1024	512	68	44	830	10	17	830	-1	69
37	615	8	17	615	128	44	45	917	15	17	918	-1	114
38	987	3	17	987	987	25	46	1224	15	17	1223	-1	152

TY: Type of Drive. CY : Cylinder

HD: Heads ST : Sectors/Cyl.

LZ: Landing Zone WP: WPcom

SZ: Size (Capacity), Mega Bytes.

APPENDIX

TECHNICAL REFERENCE

I/O ADDRESS MAP

HEX RANAGER	DEVICE	USAGE
000-01F	DMA CONTROLLER 1	SYSTEM
020-03F	INTERRUPT CONTROLLER 1	SYSTEM
040-05F	TIMER	SYSTEM
060-06F	8042 (KEYBOARD)	SYSTEM
070-07F	REAL TIME CLK	SYSTEM
080 – 09F	DMA REGISTER	SYSTEM
0A0 – 0BF	INTERRUPT CONTROLLER 2	SYSTEM
0C0 – 0DF	DMA CONTROLLER 2	SYSTEM
0F0	CLEAR MATH COPROCESSOR	SYSTEM
0F1	RESET MATH COPROCESSOR	SYSTEM
0F8-0FF	MATH COPROCESSOR	SYSTEM
F0-1F8	FIXED DISK	I/O
200-207	GAME	I/O
278-27F	PAR. PRINTER PORT 2	I/O
2F8-2FF	SERIAL PORT	I/O

300-31F	POROTYPE CARD	I/O
360-36F	RESERED	I/O
378-37F	PAR. PRINTER PORT 1	I/O
380-38F	SDLC BISYNC 2	I/O
3A0-3AF	BISYNC 1	I/O
3B0-3BF	MONO /PRINTER ADAPTER	I/O
3C0-3CF	RESERVED	I/O
3D0-3DF	COLOR ADAPTER	I/O
3F0-3F7	DISKETTE CONTROLLER	I/O
3F8-3FF	SERIAL PORT 1	I/O

TIMERS

CHANNEL	FUNCTION
0	SYSTEM TIMER
1	REFERSH REQUEST GENERATOR
2	TONE GENERATION FOR SPEAKER

DMA CHANNELS

CHANNEL	FUNCTION
0	SPARE

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1	SDLC
2	FLOOPY DISK
3	SPARE
4	CASCADE FOR DMA CONTROLLER 1
5	SPARE
6	SPARE
7	SPARE

PAGE REGISTER ADDRESSER

PAGE REGISTER	I/O HEX ADDRESS
DMA CHANNEL 0	0087
DMA CHANNEL 1	0083
DMA CHANNEL 2	0081
DMA CHANNEL 3	0082
DMA CHANNEL 5	008B
DMA CHANNEL 6	0089
DMA CHANNEL 7	008A
REFERSH	008F

INTERRUPTS

LEVEL	FUNCTION
0	SYSTEM TIMER O/P 0
1	KEYBOARD O/P 2
2	INTERRUPT FROM CONTROLLER 2
3	SERIAL PORT 2
4	SERIAL PORT1
5	PARALLEL PORT 2
6	DISKETTE CONTROLLER
7	PARALLEL PORT
8	REAL TIME CLOCK
9	SOFTWARE REDIRECTED TO INT 0AH
10	RESERVED
11	RESERVED
12	RESERVED
13	80387
14	HARD DISK DRIVE
15	RESERVED

APPENDIX

DMA CONTROLLER REGISTERS

HEX ADDRESS	COMMAND CODES
0C0	CH0 ADDRESS
0C2	CH0 WORD COUNT
0C4	CH1 ADDRESS
0C6	CH1 WORD COUNT
0C8	CH2 ADDRESS
0CA	CH2 WORD COUNT
0CC	CH3 ADDRESS
0CE	CH3 WORD COUNT
0D0	READ/WRITE REGISTER
0D2	WRITE MODE REGISTER
0D4	READ TEMPORARY/WRITE REGISTER
0D6	WRITE MODE REGISTER
0D8	CLEAR BYTE POINTER FF.
0DA	READ/WRITE MASK CLEAR
0DC	CLEAR MASK REGISTER
0DE	WRITE ALL MASK REGISTER BITS

I/O CHANNEL (J1 - J8)

PIN NO.	SIGNAL	SIGNAL	PIN NO.
A1	-I/O CH CK	GND	B1
A2	SD7	RESET	B2
A3	SD6	+ 5V	B3
A4	SD5	IRQ9	B4
A5	SD4	-5V	B5
A6	SD3	DRQ2	B6
A7	SD2	-12V	B7
A8	SD1	0WS	B8
A9	SD0	+ 12V	B9
A10	-I/OCHRDY	GND	B10
A11	AEN	-SMEMW	B11
A12	SA19	-SMEMR	B12
A13	SA18	-LOW	B13
A14	SA17	-IOR	B14
A15	SA16	-DCK3	B15
A16	SA15	-DRQ3	B16
A17	SA14	-DACK1	B17
A18	SA13	DRQ1	B18
A19	SA12	-REFERSH	B19
A20	SA11	CLK	B20
A21	SA10	IRQ7	B21
A22	SA9	IRQ6	B22
A23	SA8	IRQ5	B23
A24	SA7	IRQ4	B24
A25	SA6	IRQ3	B25
A26	SA5	-DACK2	B26
A27	SA4	T/C	B27
A28	SA3	BALE	B28
A29	SA2	+ 5V	B29
A30	SA1	OSC	B30
A31	SA0	GND	B31

I/O CHANNEL (J13 - J19)

PIN NO.	SIGNAL		SIGNAL	PIN NO.
C1	SBHE		-MEMCS16	D1
C2	LA23		I/O CS16	D2
C3	LA22		IRQ16	D3
C4	LA21		IRQ11	D4
C5	LA20		IRQ12	D5
C6	LA19		IRQ15	D6
C7	LA18		IRQ14	D7
C8	LA17		-DACK0	D8
C9	-MEMR		DRQ0	D9
C10	-MEMW		-DACK5	D10
C11	SD08		DRQ5	D11
C12	SD09		-DACK6	D12
C13	SD10		DRQ6	D13
C14	SD11		-DACK7	D14
C15	SD12		DRQ7	D15
C16	SD13		+ 5V	D16
C17	SD14		-MASTER	D17
C18	SD15		GND	D18

NOTE :

APPENDIX

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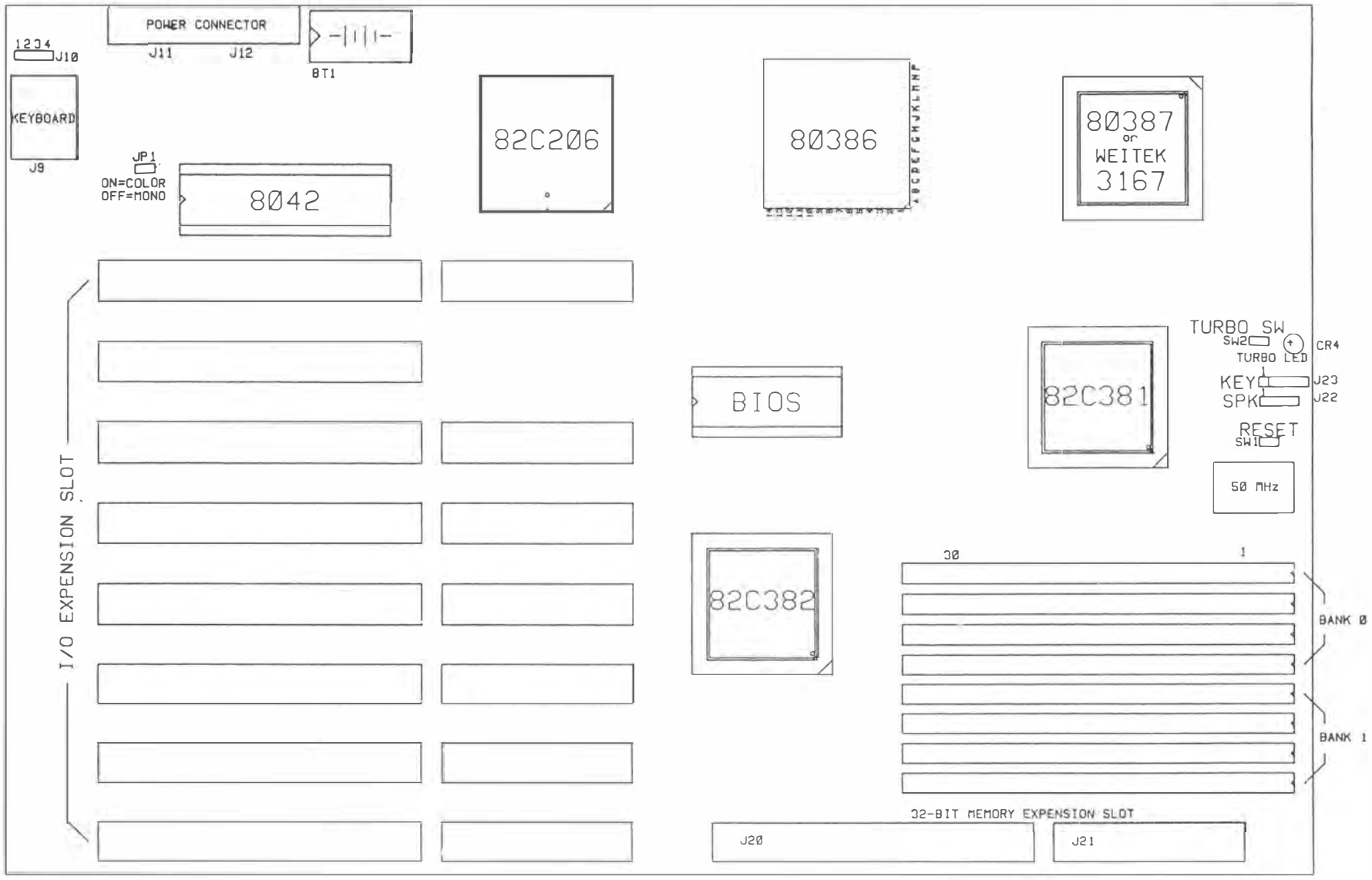

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