Cashing Tech

INFOTEL
P. O. BOX 218
6990 U. S. RT. 36 E.
FLETCHER, OH 45326

BC3486F

User's Manual

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Chapter 1 Introduction

Overview

The **BC3486F** motherboard is standard baby-sized, fully **PC/AT compatible** and offers outstanding performance and features.

With **64K, 128K, or 256K cache** memory on board option, this system board is really **a** high speed machine that is well suited for building advanced personal computers or workstations.

The most remarkable feature of the **BC3486F** is Processor ***Upgradable.*** With **386DX, 486SX, 487SX,** 486DX CPU **useage** flexibility, system board can bring the highest **performance. Especially when** the system has to be upgraded from 386 Processor to 486 level, the **BC3486F** offers the most economical solution. Chapter 3 described the detailed informations.

The **BC3486F** is desingned with using the **FRX46C411 & FRX46C402 chipset** which are highly integrated. With this **chipset, there** are only a few discrete devices required, which allows 2 memory banks to be placed on the board. The size of the memory can be scaled from **1** MB up to 32 MB.

The **BC3486F** provides options to accommodate the 80387 numerical Co-processor to further enhance system per-formance when the 386 CPU is used as **tyhe** system processor. When 486 level CPU is used as the system processor, the **upgradable** feature can be easily achieved by adjusting some jumpers. Detailed informations are provided in the related chapters.

Features

- Intel 80386DX CPU at 25133 MHz, AMD Am386 at 25/33/40 MHz, Intel 80486SX, 80487SX CPU at 16/20/25 MHz, 80486DX at 25/33 MHz CPU can be used on the BC3486F.

- Burst Mode operation

* FOREX 466 Chipset, FRX46C411 and FRX46C402, which contain:

Cache Controller	- 0 wiat state memory access if cache hit
Memory Controller	- Fast page mod8 operation
Bus Controller	- Fully PC/AT compatible

* Direct mapped cache memory, up to 256K

- Support Intel 80387 numerical Co-processor when 386 CPU is used as system processor.

- 2 memory banks on board, Supports 1 MB up to 32 MB memory size, DRAM speed: Fast page mode, 80ns or 100ns

- Software bus speed selection for maximun compatibility witH add-on cards

* Dual processing speed selection via software or hardware switch

* Supports two cacheable/non-cacheable, one local/non-local memory regions

- Software-controlled shadow RAM for system and/or viedo BIOS.

* Eight 16-bit expansion slots

- Real time clock

* Hardware trubo switch

* LEDs for power, turbo mode, and harddisk

Chapter 2 Installation

2.1 RAM Installation

Either 256KB, 1MB or **4MB** SIMM module can be used on the **BC3486F** motherboard.

The **BC3486F** supports 2 DRAM banks, Bank 0 and Bank 1, in SIMM sockets on board.

With the use of 256Kx9, 1Mx9, or **4Mx9** DRAM modules, **1M** and up to 32MB of local memory can be attained. Please refer to the following table for **the** detailed installation.

Bank 0	*Bank1*	*Memory size*
256K	*X*	***1M***
256K	*256K*	***2M***
1M	*X*	*4M*
256K	***1M***	***5M***
1M	***1M***	***8M***
4M	*X*	*16M*
1M	*4M*	*20M*
4M	***4M***	*32M*

The corresponding part reference are as below :

Bank 0 -- **SIM1, SIM2, SIM3, SIM4** (SIMM SOCKET)

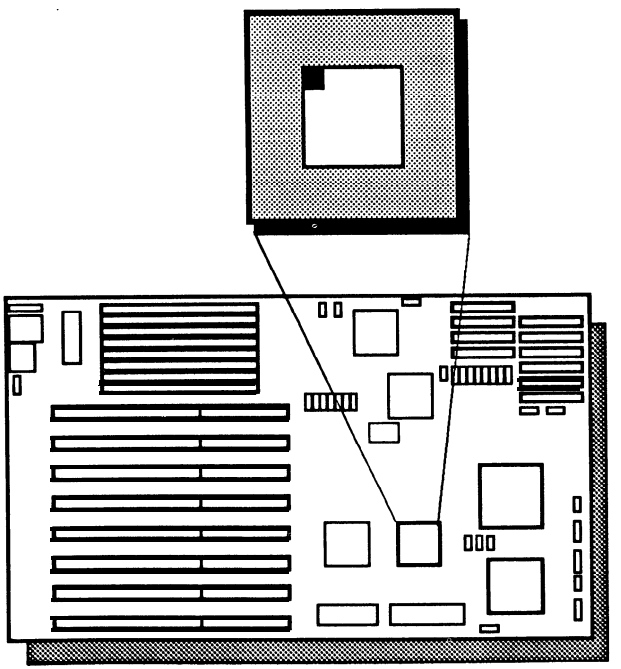
Bank **1--** SIMS, SIM6, SIM7, **SIM8** (SIMM SOCKET)

2.2 Coprocessor Installation

The **BC3486F** motherboard provides options to accommodate the Intel, Cyrix, **ULSI** 80387 numerical Co-processor to **further** enhance system performance when 80386 CPU is used **as** the system processor. **Please see** the following diagram.

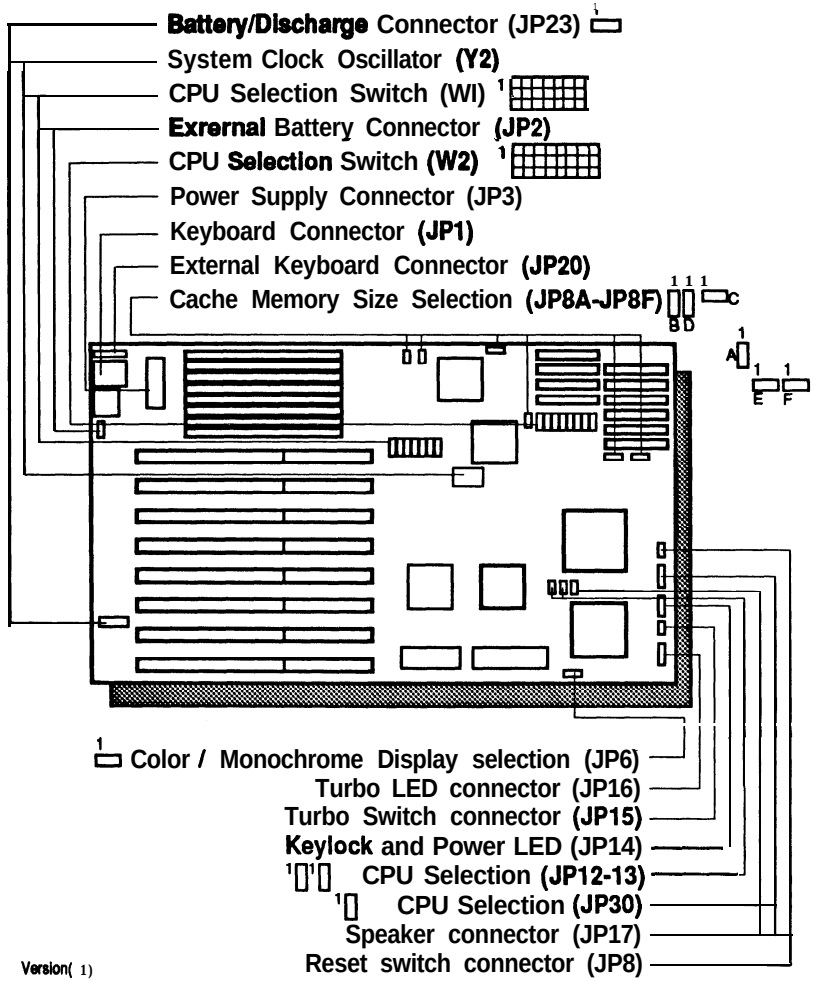
If the 486SX CPU is **used** as **the** system **processor,** please **see** Chapter **3 "Upgrade" for further** information about how to install **80487SX or 80486DX** to obtain the solution.

Intel80387



2.3 Connector Functions

BC3486F provides many functions which can be selected or adjusted by **switching** some jumpers. **Please see the following diagram and related descriptions of each jumpers. The number "1" marked near the related** jumper **indicates** the 1st **pin of the jumper.**



Power Supply connector (JP3)

JP3 is used to connect the power supply. It is very important to select a power supply which provides a power good signal. Pin assignments are as follows:

Jumper	Usage	Pins	Assignment	Notes
JP3	Power Supply Connector	1	Power good	Connect the power cables with both black wires next to each other, to the power connector
		2	+5.0V	
		3	+12.0V	
		4	-12.0V	
		5	Ground	
		6	Ground	
		7	Ground	
		8	Ground	
		9	-5.0V	
		10	+5.0V	
		11	+5.0V	
		12	+5.0V	

Color/Mono Display Selection (JP6)

JP6 allows user to choose the type of display card used. Pin assignments are as follows:

Jumper	Pin #	Functio
JP6	1 - 2 Open	Mono Monitor
	1 - 2 Short	Color monitor

Keylock connector (JP14)

JP14 is used to connect the keylock connector on the front panel of the case. Pin assignments are as follows:

Jumper	Usage	Pins	Description	Notes
JP14	Keylock to enable/disable keyboard and Power LED	1	LED power	Keylock is used to enable or disable the keyboard for security use
		2	No Connection	
		3	Ground	
		4	Keyboard lock	
		5	Ground	

Speaker connector (JP17)

Speaker connector JP17 is used to connect the speaker to the system board. Pin assignments are as follows:

Jumper	Usage	Pins	Description	Notes
JP17	Speaker connection	1	Speak Data	Connect the PC speaker to J24
		2	No connection	
		3	Ground	
		4	+ 5.0V	

Keyboard connector (JP1) & External keyboard connector (JP20)

JP1 and **JP20** are both **5-pins** connectors used to connect the keyboard either to the rear or to the front of the system panel. Pin assignments are as follows:

Jumper	Usage	Pins	Description	Notes
JP1 and **JP20**	DIN Keyboard and External Keyboard Connectors	1	Keyboard clock	Connect the keyboard to rear or front connectors
		2	Keyboard data	
		3	Spare (NC)	
		4	Ground	
		5	+5.0V	

External Battery connector (JP2)

JP2 uses the external battery when the on-board battery is not being used for operation (JP2 always open, ie, without shorting any pin).

Pin 1 shall be used as the positive lead and pin 4 shall be used as the negative lead. Pin assignments are as follows:

Jumper	Usage	Pins	Description	Notes
JP2	External Battery	1	Battery +Vcc	Pin 1 usde as positive lead, pin 4 as negative lead
		2	No connection	
		3	Ground	
		4	Ground	

Reset Switch connector (JP8)

JP8 is used to connect the reset switch to restart the system. You may connect the reset switch cable on the case with JP8. Pin assignments are as follows:

Jumper	Pin	Assianment	Pin 1&2	Function
JP8	1	Reset control	Open	No action
	2	Ground	Closed	**Reset**

Turbo Switch connector (JP15)

JP15 is used to select the system board's system clock. Pin assignments are as follows:

Jumper	Pin #	Assignment	Pin 1&2	Function
JP15	1	Pull up(+5v DC)	**Closed**	Turbo
	2	Turbo Control	Open	Non-Turbo

Turbo LED connector (JP16)

Turbo LED connector **JP1** 6 is to connect the turbo LED cable of the case. **If** system board is in turbo mode, the turbo LED should light.

Switch	Usage		Pin #	Assignment
JP16	**Turbo**	LED	**1**	Pull up **(+5V** DC **)**
			2	Turbo control
			3	Pull up **(+5V** DC)
			4	Turbo control

On-board Battery/Discharge connector (JP23)

JP23 **is** used to discharge the battery. Short l-2 pins when operation. Short 2-3 pins can discharge the battery. Pin assignments as follows:

Jumper	Pin	Assignment	Note
JP23	1	Battery Vcc	Short 1-2 pins when **operatio**
	2	**82C206** Vcc	Short 2-3 pins to discharge
	3	Ground	CMOS

Cache memory size selection (JP8A - JP8F)

JP8A, JP8B, JP8C, JP8D, JP8E and **JP8F** are used to set the cache memory sizes. The following shows the pins should be shorted for different size of cache memory:

Cache Size	JP8A	JP8B	JP8C	JP8D	JP8E	JP8F
64K	2-3	2-3	1-2	2-3	2-3	1-2
128K*	1-2	2-3	1-2	1-2	1-2	1-2
256K	2-3	1-2	2-3	2-3	1-2	2-3

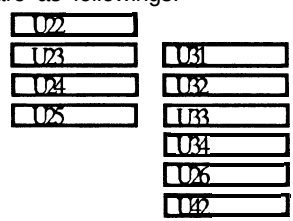
2.4 Cache Ram Configuration

The **BC3486F** suports **2** banks of SRAM provides **32K, 64K,** 128 or 256K of cache memory. The following shows the detailed information.

Cache Size	Bank A	Bank B	Tag
256K	four **32Kx8**	four **32Kx8**	two **8Kx8** (Tag 0 **&** 1)
64K	four **8Kx8**	four **8Kx8**	one **8Kx8** (Tag 0)
128K*	four **32Kx8**		one **8kx8** (Tag 0)

The corresponding bank to part reference are as followings:

Data RAM Bank 0: U31, U32, U33, U34.
Data RAM Bank 1: U22, U23, U24, U25.
Tag RAM 0: U26
Tag RAM **1:** U42



The following **table** shows the speed of SRAM needed when different type of CPU is installed as system processor:

CPU type & Speed	Tag Ram Speed(nS)	Data Ram* Speed(nS)	CPU type & Speed	Tag Ram Speed(nS)	Data Ram Speed(nS)
386DX-33	20	25	3860X-40	20	20
486SX-16	30	35	486SX-20	30	35
486SX-25	25	30	4860X-25	25	30
486DX-33	20	25	486DX2-50	25	30
486DX2-66	20	25			

***Due to the limitation of CACHE** BURST MODE **operation, this motherboard can not support 128K cache when 486** CPU **is used!!**

Charpter 3 Upgrade

If your BC3486F was originally equipped with 486DX CPU, please skip this chapter because you have the maximum performance already.

BC3486F motherboard offers **the** feature to upgrade the system from 386 Processor to 486 level. This feature will help you easy to upgrade your system and you can **see** the **very** obvious difference after you upgrade it. Please notice the followings:

1. Make sure your original 386 **CPU** is 33 or 40 MHz.

2. Find page 7 of this manual, and reference the location of Y2, which is the SYSTEM clock of the motherboard. If your 386 CPU is 33 MHz, then the Y2 is 66 MHz. **If** your 386 CPU is 40 MHz, **then the** Y2 is 80 MHz.

3. The NEW Processor that you want to upgrade, no matter it's **486SX, 487SX,** or **486DX,** please make sure the speed of the processor and the Y2 has to be changed to DOUBLE of the Processor Speed.

NOTE: The speed of Y2 CAN NOT be higher than **twice of the speed of CPU or the CPU will be damaged!!**

Currently **availible** 486 series processors can be upgraded and the proper speed of Y2 are as followings:

CPU Speed	Y2	AT-BUS Clock'	Example
20MHz	40MHz	CLK-IN/3	386DX-20, 486SX-20, 487SX-20
25MHz	50MHz	CLK-IN/3	386DX-25, 486SX-25, 487SX-25, 486DX-25 486DX2-50
33MHz	66.6MHz	CLK-IN/4	386DX-33, 486DX-33 4860X2-66
40MHz	80MHz	CLK-IN/5	386DX-40

tf you need different **speed** of System Clock **Oscilator,** please contact your dealer for further service.

• AT BUS Clock: The setup value on Page 20 of Advanced **Chipset** Setup.

3.1 Switch & Jumper Setting after Upgrading (CPUselection jumpers & switches)

(W1A-W1G, W2A-W2H; JP12, JP13, & JP30)

After you install the 486 processor, JP12, JP13, & JP30 are the jumpers that you need to select:

A. WIA-WIG, W2A-W2H - to select 386 or 486 CPU:

Function	Switch	Pin #
to select 80386 CPU	**WIA-WIG**	2-3 short
	W2A-W2H	**2-3 short**
to select 80486 CPU	WIA-WIG	1-2 short
	W2A-W2H	I-2 short

B. JP12-13 - When select 486 CPU, to select 486DX or 486SX:

Function	Jumper	Pin #
to select 486DX or 487SX CPU	**JP12-13**	I-2 short
to select **486SX CPU**		2-3 short

C. **JP30 - When 1-2 pins of JP12-13 are shorted, to select 486DX or 487SX CPU to be used:**

Function	Jumper	Pin #
to select 486DX CPU	**JP30**	**1-2** short
to select 487SX CPU		2-3 short
to select 486SX CPU		open (when 2-3 pins of JP12 & JP13 are shorted)

Chapter 4 Operation

This chapter tells the user how to use the SETUP for BC3486F mainboard. Please note that any improper use of this setup can cause damage to your system. Therefore please make sure you understand thoroughly before making any change or you may contact your dealer for more detailed information.

This chapter will describe briefly the BIOS written by AMI. (American Megatrend Inc.) In the mean time do not use other BIOS than the one uses in this board as it will cause functional incompatibility.

4.1 AMI BIOS Register Setup

The setup program Is used to configure the system. These system options are stored in the CMOS. If the CMOS is good, the system is configured with the values stored in the CMOS. If the CMOS is bad, the system is configured with the default values stored in the ROM file. There are 2 sets of BIOS values stored in the ROM file: the BIOS Setup **default values** and the **Power-On default values.**

The **BIOS Setup default values** are the default values which should provide optimum performance for the system. They are the best case default values.

The **Power-On default values,** which are the worst case defaults, are the stable values for the system. They are to be used if the system is performing erratically because of hardware problems.

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.

PgUp/PgDn/Ctrl-PgUp/Ctrl-PgDn: Modify the default value of the options forth8 highlighted feature. If there are less than 10 available options, the Ctrl-pgUp and Ctrl-PgDn keys function the same as the PgUp and PgDn keys.

F1: Displays **help** screen for **selected** feature.

F2/F3: Change background and foreground colors.

F5: Retrieves the **values** which **were** resident when current **setup** session was started. **These** values will **be CMOS** values if the CMOS was uncorrupted at the start of the session, or they wiii **be** the BIOS **Setup default** values.

F6: Loads ail features in the Advanced CMOS Setup/Advanced **Chipset Setup** with **the BIOS** Setup defaults.

F7: Loads ail features in the Advanced CMOS Setup/Advanced **Chipset** Setup with the Power-On defaults.

F10: Saves aii changes made to Setup and exits program.

Note: The defaults value for the prompts which occur when the **<F5>,<F6>,and <F7>** keys are pressed is always **<N>** (No). Actually executing these options requires changing the **<N>** to **<Y>** (Yes) and pressing <ENTER>.

4.2 Standard CMOS Setup

The Standard CMOS Setup utility is used to configure the following features:

Date : Month, Date, and Year. Ranges for each value are **listed** below in prompt box in the lower right corner of the CMOS Setup Screen.

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

Daylight Savings **:** Disbaled or Enabled.

Hard Disk C and Hard Disk D **:** Hard disk types from 1 to 46 are standard ones; type 47 is user **definable.** The user must enter the hard disk parameters for **each** drive.

The drive types are identified by **the** following characteristics:

Type	The number designation for a drive with certain identification parameters.

Cyl The number of cylinders found in the specified drive type.

Heads. The number of heads found in the **specifieD** drive type.

WPcom **The** read delay circuitry which takes into account the timing differences between the inner and outer edges of **the** surface of the disk platter. The number designates the starting cylinder of the signal.

L-zone L-zone is the landing zone of the heads. This numberdetermines the cylinder location where the heads will normally park when the system is shut down.

Capacity The formatted capacity of the drive based on the formula:

(# of heads) x (# of cylinders) x (# of secs/cyl.) x (512bytes/sec)

"Not Installed" is available for use as an option. This option could be used for diskless workstations and SCSI hard disk. Type 47 may be used for both hard disks C and D. The parameters for type 47 under Hard Disk C and Hard Disk D may be different.

Floppy Drive A and Floppy Drive B : The options are 360 KB **51/4",** 1.2 MB **51/4",** 720 KB **31/2",** 1.44 MB **31/2",** and Not installed. Not installed **could** be used as an option for diskless workstations.

Primary Dispaly : Options are Monochrome, Color 40x25, **VGA/PGA/** EGA, Color **80x25,** and Not installed. The Not installed option could be used for network file servers.

Keyboard : Options are installed or Not installed.

4.3 Advanced CMOS Setup

The advanced CMOS Setup program is equipped with a series of help screens, accessed by the **<F1>** key, which will display the options available for a particular configuration feature and special help for some of the opt ions.

The following is a short description for each of the options on the Advanced CMOS Setup Screen.

Advanced CMOS Setup Screen of Factory Defautt

BIOS SETUP PROGRAM - ADVANCED CMOS SETUP (C) 1990 American Megatrends Inc., All Rights Reserved			
Typematic Rate Programming	: Disabled	Video Rom Shadow C000, 32K	: Enabled
Typematic Rate Delay (msec)	: 500	Adaptor ROM Shadow C800,32K	: Disabled
Typematk Rate (Chars/Sec)	: 15	Adaptor ROM Shadow D000,32K	: Disabled
Above 1 MB Memory Test	: Disabled	Adaptor ROM Shadow D800,32K	: Disabled
Memory Test Tick Sound	: Enabled	Adaptor ROM Shadow E000,32K	: Disabled
Memory parity Error Check	: Enabled	Adaptor ROM Shadow E800,32K	: Disabled
Hit <DEL> Message Display	: Enabled	System ROM Shadow F000,64K	: Enabled
Hard Disk Type 47 RAM Area	: 0:300		
Wait For <F1> If Any Error	: Enabled		
System Boot Up Num Lock	: On		
Floppy Drive seek At Boot	: Enabled		
System Boot Up Sequence	: A:, C:		
System Boot Up CPU Speed	: High		
External Cache Memory	: Enabled		
Internal Cache Memory	: Enabled		
Fast gate A20 Option	: Enabled		
Turbo Switch Function	: Enabled		
Password Checking Option	: Setup		
Esc: Exit ↓→↑← Select (Ctrl)PgUp/PgDn:Modify F1:Help F2/F3:Color F5: Old Values F6: BIOS Setup Defaults F7: Power-On Defaults			

Typematic Rate Programming: By enabling this option, the user can adjust the rate at which a keystroke is repeated. The options "Typematic Rate Delay **(msec)"** and "Typematic **Rate(Chars/sec)"** affect this rate. When **a** key is pressed and held down, the character appears on the screen and after a **delay** set by the Typematic Rate Delay, it keeps on repeating at a rate set by the Typematic Rate value. When two or more keys are pressed and held down **silmultaneously,** only the last key pressed will be repeated at the typematic rate. This stops when the last key pressed is released, even if other keys are depressed.

Available **Typematic Rate Delay** options are: **250,500,750,** & **1000.**

Available **Typematic Rate** options **are:30.0,26.7,24.0,21.8,20.0,18.5, 17.1, 16.0 ,...., 2.0.**

Above 1 MB Memory Test: This feature, when enabled, will invoke the POST memory routines on the RAM above **1** MB (if present on system). If disabled, the BIOS will only check the first **1MB** of RAM.

Memory Test Tick Sound: This option will enable (turn on) ordisable (turn off) the **"** ticking **"** sound during the memory test.

Memory Parity Error Check: If the motherboard **doesn't** have parity RAM, user may disable the memory parity error checking routines in the BIOS.

Hit <DEL> Message Display: Disabling this option will prevent message:

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

from appearing on the screen when the system boot-up.

Hard Disk Type 47 RAM Area: The AMI BIOS SETUP features two user-definable had disk types. Normally, the data for these disk types are stored at **0:300** in lower system PAM. 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 KB is used for the hard disk data storage.

Wait For <F1> If Any Error: Before the system boots-up, the BIOS will execute the POST routines, a series of system diagnostic routines. If any of these tests fail, but a non-fatal error has occurred and the system can still function, the BIOS will respond with an appropriate error message followed by the following statement:

"Press <F1> to continue"

If this option is disabled, any non-fatal error which occurs will not generate the above statement, but the BIOS will still display the appropriate error message. This will eliminate the need for any **user response to a non-fatal error condition message.**

System Boot Up Num Lock : The user may turn off the "Num Lock" option on his Enhanced Keyboard when the system is powered on. This will allow him to use the arrow keys on the numeric keypad instead of using the other set of arrow keys on the Enhanced Keyboard. The BIOS will default to turning the "Num Lock" on.

Floppy Drive Seek At **Boot :** The default for this option is **"Disabled"** to allow a fast boot and to decrease the possibility of damage to the heads.

System Boot Up Sequence : The AMI BIOS will normally attempt to boot from floppy drive A:(if present), and if unsuccessful, it will attempt to boot from hard disk C:.

System Boot Up CPU Speed : This option can set the CPU speed during POST (Power On Self-Test). **"High"** means the CPU is running on full speed. **"Low"** means the CPU is running 1/2 of CPU speed for better reliability. Note when 40 MHz CPU is installed, set this option as "Low".

External Cache Memory : This option allows user to specify whether the external cache is enable or disable.

Internal Cache Memory : This option allows user to enable or disable the internal cache of the 80486 CPU.

Fast Gate A20 **Option :** Enable this option will optimize OS/2 environment.

Turbo Switch Function : This oprion allows users to enable or disable turbo switch.

Password Checking Option : The password feature can be used to prevent from unauthorized system boot-up or use of BIOS SETUP.

If the "Always" option is chosen at Setup, each time the system is turned on, the prompt for user password will appear.

Default setting is "Setup". The password prompt will not appear when the system is turned on, but will appear if the user attempts to enter the Setup program. Factory default password is **"AMI".**

The program allows three attempts to key in the correct password. After each incorrect attempt, the prompt to enter the current password will appear, followed by an **"X".** After the third incorrect attempt, the system will lock and it will be necessary to reboot.

Video ROM Shadow COOO, 32K **:** Shadow RAM enabled or disabled at each different segment.

Adaptor ROM Shadow C800 ~ E800 : This option enable or disable the Shadow Function of Adaptor's BIOS if there is, such as SCSI Controller.

System ROM Shadow FOOO, 64K : This option enable or disable Shadow Function of SYSTEM BIOS.

4.4 Advanced Chipset Setup

This portion of the BIOS Setup is entirely chip set specific and requires knowledge about the FOREX 46C411/46C402 chipset in use. This option is used to change the register values for the chipset. These registers control most of the system options. The screen of the Factory Setup Value of Advanced Chipset Setup is shown on the next page. A short description follows for each of the options on the Advanced Chipset Setup.

Advanced CHIPSET Setup Screen of Factory Default

```
BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP
(C) 1990 American Megatrends inc., All Rights Reserved

AT-BUS Clock Speed                : CLK-IN/4
I/O Cmd Recovery Control          : Disabled
Adapt. Shadow RAM Cacheable       : No
video shadow RAM Cacheable        : No
System Shadow RAM Cacheable       : No
Remap Memory                      : Enabled
Remapped Memory Cacheable         : Yes
Block-1 Memory Size               : 256KB
Block-1 Memory Base Address       : 1024KB
Block-1 Memory Cacheable          : Yes
Block-2 Memory Size               : 256KB
Block-2 Memory Base Address       : 1024KB
Block-2 Memory Cacheable          : Yes
DRAM RAS Precharge Time           : 3.5
DMA Clock                         : SCLK/2

Esc: Exit ↓→↑← :Select (Ctrl)PgUp/PgDn:Modify F1 : Help  F2/F3:Color
F5: Old Values   F6:BIOS Setup Defaults   F7:Power-On Default!s
```

AT-Bus **Clock Speed:** This option provides the selection of different Bus Clock which allows user to use the I/O cards with various speed. Different type & speed of CPU has to set with different AT Bus Clock Speed. Please see Page 12 for proper setup value.

I/O Cmd Recovery control: This function will generate long enough I/O command recovery time for slow reacting peripheral cards when **'ENABLED".**

Note : When 486SX/487SX-20 is used, I/O Cmd Recovery Control must be enabled.

Adapt. Shadow RAM Cacheable : This option allows to select shadowed address C8000H ~ EFFFFH to be cacheable or not. This option will only effect when Adapter ROM Shadow is Enabled in Advanced CMOS Setup.

Video Shadow RAM **Cacheable :** This option allows to select shadowed address COOOOH ~ C7FFFH to be cacheable or not. This option will only effect when Video ROM Shadow is Enabled in Advanced CMOS Setup.

System Shadow RAM **Cacheable :** This option allows to select shadowed address FOOOOH ~ FFFFFH to be cacheable or not. This option will only effect when System ROM Shadow is Enabled in Advanced CMOS Setup.

Remapped Memory : Enable this option can save up to 256K usable memory located from 640K to 1MB (OAOOOOH ~ OFFFFFH) can be remapped to the top of the on-board memory.

Remapped Memory Cacheable : "Yes" option allows to save up to 256KB **unuseable memory. The** physical memory location can be remapped. **If** set as "No", the **Shadow function will be disabled automatically.**

Block-l Memory Size : This option allows user to select **the** memory Block-l size **from 256KB, 512KB,** 1 MB, or 2MB.

Block-l Memory Base Address : This option must be a boundary of Block-l Memory **Size.** Information of options are avaiiibie when press **F1.**

Block-l Memory Cacheable : This option is for Local Memory Access. It must be **set** as Cacheable **("Yes").**

Block-2 Memory Size : This option allows user to select the memory Block-2 size from **256KB, 512KB,** 1 MB, or **2MB.**

Block-2 Memory Base Address : This option must be a boundary of Block-l Memory Size. Information of options are availible when press **F1.**

Block-2 Memory Cacheable : This option is for Local Memory Access. It must be set as Cacheable ("Yes").

DRAM RAS Precharge Time : Setting this option as "2.5" will speed up the **precharge** cycle if 20 MHz CPU is used. Note that "3.5" is better for 33 or 40 MHz CPU.

DMA **Clock :** This option allows to set the DMA Clock as **"SCLK"** for more reliability when **20MHz** CPU is used. **"SCLK/2"** setting for **33/40MHz** CPU.

4.5 Auto Configuration With BIOS Defaults

The Auto Configuration With BIOS feature uses the default system values before the user has changed any CMOS values. If the CMOS is corrupted, the BIOS defaults will automatically be loaded to the "Advanced CMOS Setup" and "Advanced **CHIPSET Setup.** This default values will provide the optimum performance for the system.

4.6 Auto Configuration With Power-On Defaults

This feature uses the default Power-On values. You may wish to use this option as a diagnostic aid if your system is behaving erratically.

4.7 Change Password

The **BIOS SETUP** program has a optional password feature. The password check function is enabled or disabled in Advanced CMOS Setup. The password check function is enabled by choosing either **"Always"** or **"setup".** Please see page 19 for detailed descriptions.

The password, which will be stored in the CMOS, cannot exceed 6 ASCII characters. A default password, to be used if the CMOS is corrupted, is stored in the **ROM.** The default password is **<AMI>.**

To change the user password, by using the arrow keys to move the cursor to this selection and pressing **<Enter>,** and follow the request and ask for help by pressing **F1** key when needed.

Once Setup is completed and the changed values have been stored in the CMOS, when the system next boots, the user will be prompted for the password if the password function is present and has been enabled.

4.8 Write To CMOS And Exit

The features selected and configured in the Standard Setup, Advanced CMOS Setup, Advanced Chip Set Setup, and the new Password Setup will be stored In the CMOS when this option is taken. The CMOS checksum is calculated and written to the CMOS. Control is then passed back to BIOS.

4.9 Do Not Write To CMOS And Exit

This option passes control back to BIOS without writing any changes to the CMOS.

APPENDIX A BIOS Error Beep Codes

During the POST (Power On Self Test) routines, which are performed **each time the system is powered on, errors** may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot up process. The error messages normally appear on the screen. **See Appendix** B for BIOS Error Messages.

Fatal errors are those which will not allow the system to continue the **boot-**up procedure. **If a** fatal error occurs, you should consult with your local dealer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on **the** fatal error list **below** correspond to the number of beeps for the **corresponing** error. All errors listed, with **the exception of** # 8, are fatal errors.

# of Beeps	Error Message
1	**Refresh Failure :** The memory **refresh** circuitry of the motherboard is faulty.
2	**Parity Error :** A **parity** error was detected in the base memory (the first block of 64KB) of the system.
3	Base 64 **KB Memory Failure :** A memory failure occurred within the first 64 KB of memory.
4	**Timer Not Operational :** Timer # 1 on the system board has failed to function properly.
5	**Processor Error :** The CPU on the system board has generated an error.
6	8042 **- Gate A20 Failure :** The keyboard controller (8042) contains the Gate A20 switch which allows the CPU to operate in virtual mode. This error message means that the BIOS is not able to switch **the** CPU into protected mode.

# of Beeps	Error Message
7	**Processor Exception Interrupt Error :** The CPU on the motherboard has generated an exception interrupt.
8	**Display Memory Read/Write Error :** The system video adapter is either missing or tts memory is faulty. Pleas8 note **: This is not a fatal error.**
9	ROM **Checksum Error :** The ROM checksum value does not match the value encoded in the BIOS.
10	**CMOS Shutdown Register Read/Write Error:** The shutdown register for the CMOS memory has failed.

APPENDIX B BIOS Non-Fatal Error Message

If a non-fatal error occurs during the POST routines performed each time the system is powered on, the **error message wiii appear on** the screen **in the following format:**

ERROR Message **Line 1**
ERROR Message Line 2
Press <F1> to RESUME

Note the error message and press the **<F1>** key to continue with the **boot-up** procedure.

Note: **If** the **" Wait for <F1> if Any Error "** option in the Advanced CMOS Setup portion of the BIOS SETUP PROGRAM has been set to "disabled", the **<F1>** prompt will not appear on the third line.

For most of the error messages, there is no ERROR Message **Line** 2. Generally, for those messages containing a line 2 ERROR Message, the text will be **" RUN SETUP UTILITY ".** Pressing **the <F1> key** will **invoke** the BIOS SETUP PROGRAM.

A description of **the** error messages appear below:

CH-2 Timer Error : Most AT standard system boards include two timers. An error with timer # 1 is a fatal en-or, explained in Appendix A. If an error occurs with timer # **2,** this error message appears.

INTR #1 Error: The interrupt channel **#1** failed the POST routine.

INTR #2 Error: The interrupt channel **#2** failed the POST routine.

CMOS Battery State Low : There is a battery in **your** system board which is used for storing **the** CMOS values. This **battery** appears to **below** in power and **needs** to **be** replaced.

CMOS Checksum Failure: After the CMOS values are saved, achecksum value is generated to provide for error checking. If the previous value is different from the value currently read, this error message appears. To correct this error, you should run the BIOS SETUP PROGRAM.

CMOS System Options Not **Set :** The values stored in the CMOS are either corrupt or nonexistent. Run the BIOS SETUP PROGRAM to **correct** this **error.**

CMOS Display Type Mismatch : The type of video stored in CMOS does **not match the type detected by the BIOS. Run the BIOS SETUP PROGRAM** to **correct** this **error.**

Display Switch Not Proper : Some systems require that a video switch on the motherboard b8 **set** to **either** color or monochrome, depending upon the **type** of video you are using. To correct this situation, set the switch properly. (Remember to shut down the system first.)

Keyboard Is locked . . . Unlocked It : The keyboard lock on the system is engaged. The system must **be unlocked to** continue the boot up procedure.

Keyboard Error : The BIOS has encountered a timing problem with the keyboard. You may also set the : Keyboard " option in the BIOS Setup Program Standard CMOS Setup to " Not installed", which will cause the BIOS to skip the **keyboard** POST routines.

KB/Interface Error : The BIOS has found an error with **the** keyboard connector on the system board.

CMOS **Memory Size Mismatch :** if **the** BIOS finds the amount of memory on your system board to be different from the amount stored in CMOS, this error message is generated. Run the BIOS SETUP Program to correct this error.

FDD **Controller Failure :** The BIOS is not **able** to communicate with **the** floppy disk drive controller. Check all appropriate connections after the system is **powered** off.

HDD Controller **Failure :** The BIOS is not **able** to communicate with the hard disk drive controller. Check all appropriate connections after the system is powered off.

C: Drive Error : The BIOS is not receiving any response from hard disk drive C:. **It** may be necessary to run the Hard Disk Utility to correct this

problem. Also, check the type of hard disk selected in the Standard CMOS Setup of the BIOS SETUP Program to see if the correct hard disk drive has been selected.

D: Drive Error : The same error has occurred with hard drive D:. Follow the procedures in C: Drive Error to correct this situation.

C: Drive Failure : The BIOS cannot get any response from the hard disk drive C:. It may be necessary to replace the hard disk.

D: Drive Failure : The same error as C: Drive Failure has occurred with hard drive D:.

CMOS Time & Date Not Set : Run the Standard CMOS Setup of the BIOS SETUP Program to set the date and time of the CMOS .

Cache Memory Bad, Do not Enable Cache !: The BIOS has found the cache memory of the motherboard to be defective. Consult your system manufacturer to repair this problem.

8042 Gate A20 Error : The Gate A20 portion of the keyboard controller (8042) has failed to operate correctly. The 8042 chip should be replaced.

Address Line Short : An error has occurred in the address decoding circuitry of the motherboard.

DMA # 2 Error : An error has occurred with the second DMA channel on the motherboard.

DMA # 1 Error : An error has occurred with the first DMA channel on the motherboard.

DMA Error : An error has occurred with the DMA controller on the motherboard.

No ROM Basic : This error occurs when a proper bootable sector cannot be found on either the floppy diskette drive A: or the hard disk drive C:. The BIOS will try at this point to run ROM Basic, and the error message will be generated when the BIOS does not find it.

Diskette Boot Failure : The diskette used to boot-up in floppy drive A: is corrupt, which means you cannot use it to boot-up the system. Use another boot diskette **and follow** the instructions on the screen.

Invalid **Boot Diskette : The** BIOS can read the diskette in floppy drive A:, **but it** cannot boot-up the system with **It.** Use another boot diskette and follow the instructions on the screen,

On Board Parity Error : The BIOS has encountered a parity error with some memory installed on the system board. The message will appear as foilows:

ON BOARD PARITY ERROR
ADDR (HEX) = (XXXX)

Where XXXX **is** the address (in hexadecimal) at which the error has occurred. "On Board " means that it is part of the memory attached directly to the system board, as opposed to memory installed via an expansion card in an **I/O** (BUS) slot.

Off **Board Parity Error :** Ths BIOS has encountered a parity error with some memory installed in an **I/O** (BUS) slot. The message will appear as foiiows:

Off BOARD PARITY ERROR
ADDR (HEX) = (XXXX)

where XXXX is the address (in hexadecimal) at which the error has occurred. " Off Board " means that it is part of the memory installed via an expansion card in an **I/O** (BUS) slot, as opposed to memory attached directly to the system board.

Parity Error ????: The BIOS has encountered a pariiy error with some memory in the system, but **it** is not able to determine the address of the error.