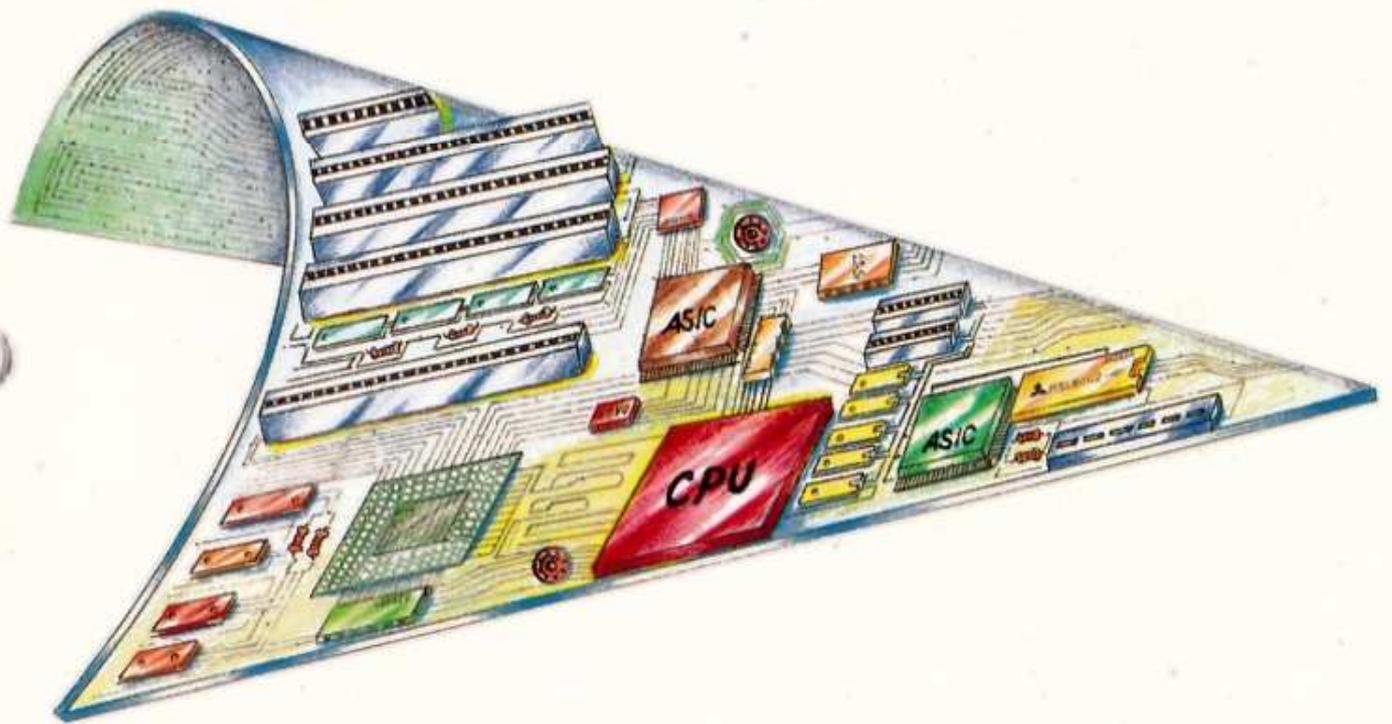# 333UC/340UC/
333UCB/340UCB

333UC/340UC/333UCB/340UCB
V.01 Oct., 1992

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II

PREFACE

We, the manufacturers, would like to congratulate you on, what we think was a very wise decision to purchase the 333UC/340UC/333UCB/34OUCB mainboard.

No matter what walk of life, the 333UC/340UC/333UCB/340UCB will perform beyond the call of duty giving you not only excellent value for your money, but performance second to none.

We hope that this manual will provide all the information that you will need to operate your PC/AT. However, should you require any further information, please contact your dealer who will be pleased to assist you.

IV

TABLE OF CONTENTS

CHAPTER 4 Power-On Self Test & Error Messages

CHAPTER 5 AMI BIOS Setup

1 INTRODUCTION

The 333UC/340UC/333UCB/340UCB is a high-performance AT-compatible system board that provides incredible speed in prodessing while maintaining full compatiblity with the IBM*PC/AT*. The system board is designed to be mounted in a standard PC/XT*, Baby AT, orPC/AT-type enclosure and uses undustry-standard power supply inputs, connectors, expansion board sockets, and so forth. In other words, you can design a new system, or upgrade your existing system with no modifications to existing, or available components. The following sections will provide quick and precise information for the end-user to understand and properly use the 333UC/340UC/333UCB/340UCB motherboard.

1-1 SPECIFICATIONS

❏ CPU:
  80386DX-33/40, Cx486DLC-33/40
  PGA and PQFP CPU are acceptable

❏ COPROCESSOR:
  Weitek 3167 or 80387 DX , optional

❏ MEMORY:
  Use 256KB/1MB/4MB SIMM Modules for Up to 32MB on board with paging mode

❏ CACHE SIZE:
64K/128K/256K Bytes

❏ BIOS:
AMI (single 64K EPROM configuration)

❏ I/O SLOTS:
16-bitx6, 8-bitx1

❏ SHADOW RAM:
System BIOS, Video BIOS, and Adapter BIOS

❏ SIZE:
25.8cmx22.0cm

1-2 FEATURES

❏ 100% IBM*PC/AT* compatible

❏ Supports EMS version 4.0

❏ Programmable shadow RAM, and optional shadow block size

❏ Flexible cache size cache controller with different line size for cache update

❏ Ability to add wait states to DRAM read/write access by BIOS setting

❏ Rechargeable battery and external battery connector

❏ PGA or PQFP CPU acceptable

1-3
PERFORM-
ANCE

	LANDMARK V1.14 (MHz)	POWER METER V1.7 (MIPS)
333UC	54.8	7.9
340UC	65.7	9.5
333UCB	107.2	10.5
340UCB	130	12.5

1-4
MAINBOARD
LAYOUT

The next page contain the mainboard layout:
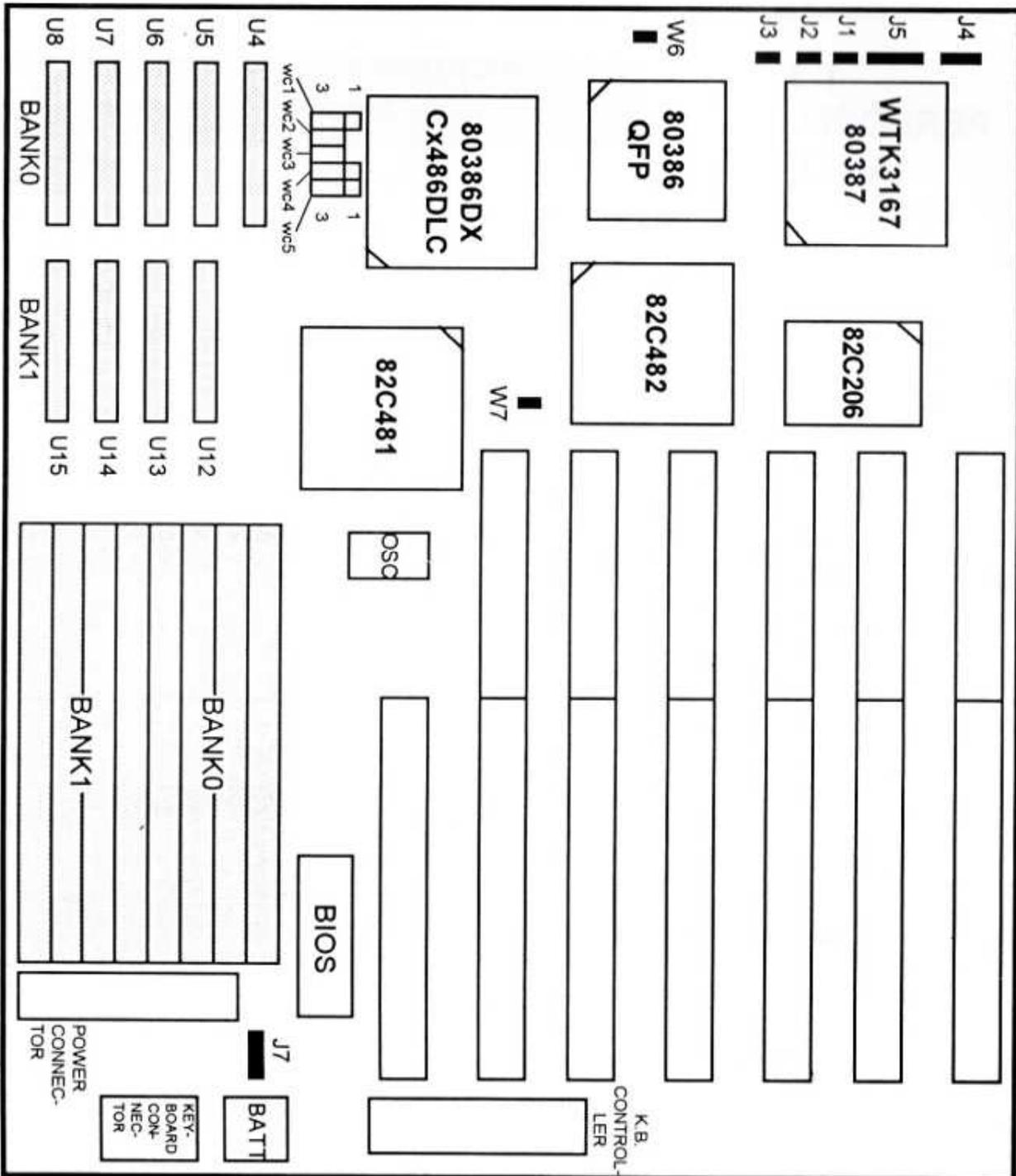
333UC/340UC/333UCB/340UCB Board Layout

1-5 JUMPER SETTINGS

J3 Turbo LED

+
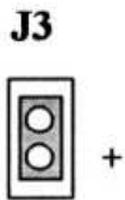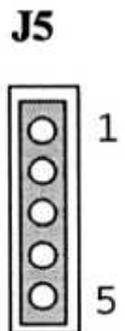
J5 PowerLED & Keylock

1
5

1. LED output
2. No connection
3. GND
4. Keylock
5. GND
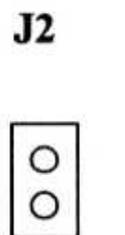
J2 Turbo Switch

When BIOS advanced CMOS Setup
System boot up CPU speed : High

Short: High speed
Open: High speed or speed chosen by keyboard
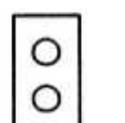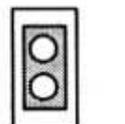
When BIOS advanced CMOS Setup
System boot up CPU speed :Low

Short: High speed
Open: Low speed or speed chosen by keyboard
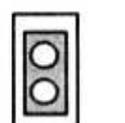
Keyboard:
{CTRL} {ALT} {+} : High speed
{CTRL} {ALT} {-} : Low speed

J7   External battery Jumper

```
┌─────────────┐
│ ○ ○ ○ ○ │
└─────────────┘
  4           1
```

1. +VDD (External Battery Power Input)
2. No connection
3. GND
4. GND

J1   Reset Switch

1. GND
2. Power good

```
┌───┐
│ ○ │ 1
│ ○ │
└───┘
```

J4   Speaker Jumper

1. Speaker out
2. No connection
3. GND
4 +5VDC

```
┌───┐
│ ○ │ 1
│ ○ │
│ ○ │
│ ○ │ 4
└───┘
```

W6,W7   Coprocessor Enable
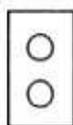
```
┌───┐ ┌───┐
│ ○ │ │ ○ │     open : Coprocessor not installed
│ ○ │ │ ○ │
└───┘ └───┘
 W6    W7

┌───┐ ┌───┐
│ ○ │ │ ○ │     short: Coprocessor installed
│ ○ │ │ ○ │
└───┘ └───┘
 W6    W7
```
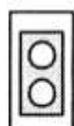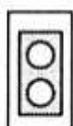
1-6 CACHE CONFIGURA-TION

	WC1	WC2	WC3	WC4	WC5
64K	2-3	OFF	OFF	1-2	1-2
128K	1-2	OFF	ON	2-3	1-2
256K	2-3	ON	ON	2-3	2-3

64K CACHE

U4   8Kx8

U5   8Kx8   U12   8Kx8

U6   8Kx8   U13   8Kx8

BANK0   BANK1

U7   8Kx8   U14   8Kx8

U8   8Kx8   U15   8Kx8

1
3

WC1 WC2 WC3 WC4 WC5
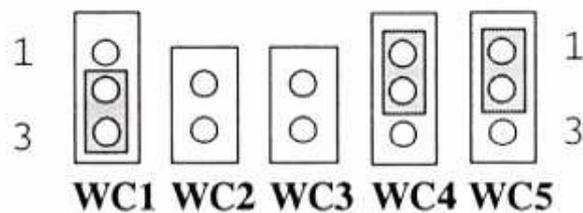
TAG RAM: **8Kx8x1 pcs**
DATA RAM: 8Kx8x8 pcs

128K CACHE

U4   8Kx8

U5   32Kx8   U12

U6   32Kx8   U13

BANK0

U7   32Kx8   U14   BANK1

U8   32Kx8   U15

1   1

3   3

WC1 WC2 WC3 WC4 WC5
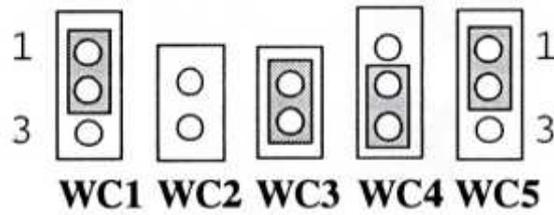
TAG RAM: 8Kx8x1 pcs
DATA RAM: 32Kx8x4 pcs

256K CACHE

U4	32Kx8		

U5	32Kx8		U12	32Kx8	
U6	32Kx8		U13	32Kx8	
BANK0					BANK1
U7	32Kx8		U14	32Kx8	
U8	32Kx8		U15	32Kx8	

WC1 WC2 WC3 WC4 WC5
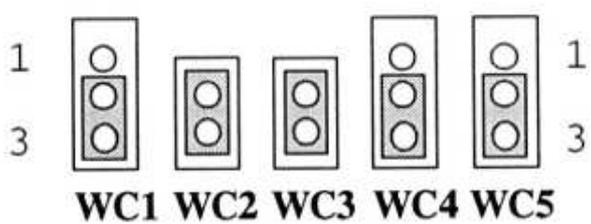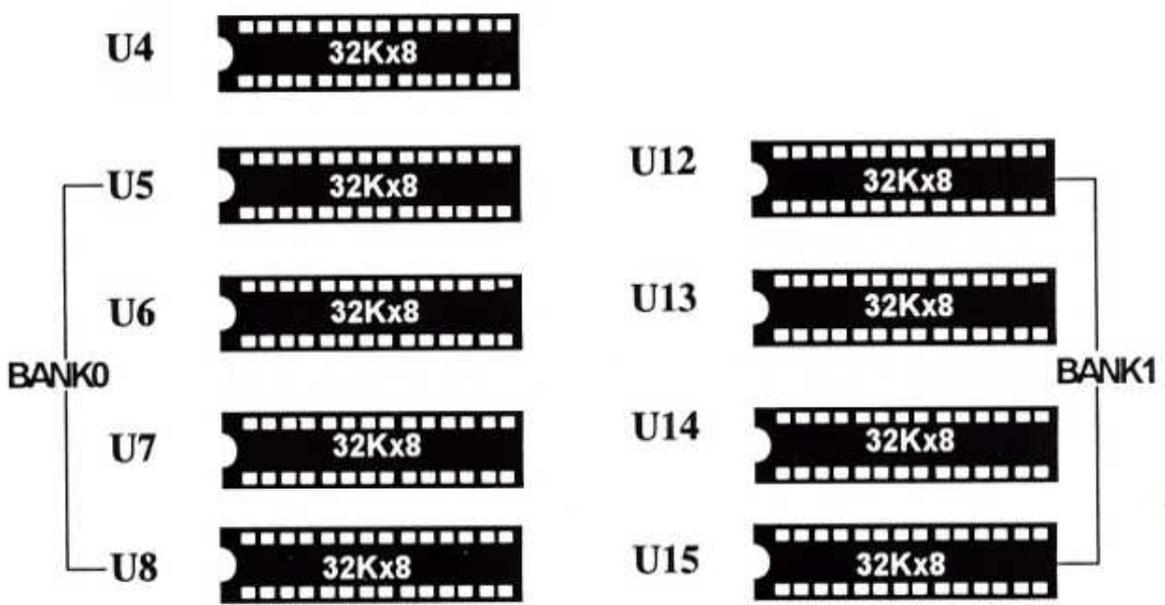
TAG RAM: 32Kx8x1 pcs
DATA RAM: 32Kx8x8 pcs

2 CONFIGURATION

This chapter briefly describes the major features of the 333UC/340UC/333UCB/340UCB systemboard. It covers the following topics:

❑ Microprocessor

❑ Math Coprocessor

❑ Main Memory

❑ The UMC 82C481/82C482/82C206 Chipset

❑ Shadow RAM & Memory Remapping

❑ Keyboard Controller

❑ I/O Channel PIN Assignments

2-1 MICRO-PROCESSOR
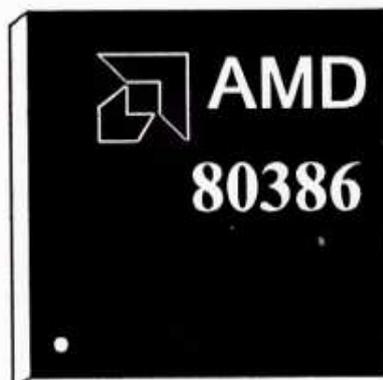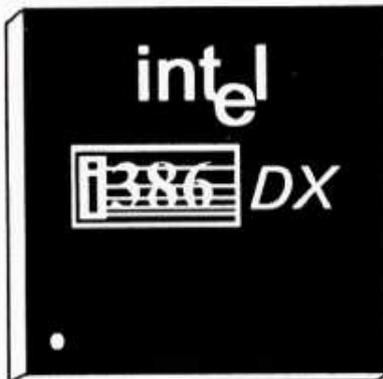
The 333UC/340UC/333UCB/340UCB motherboard may acceptable 80386DX-33/40 and Cx486DLC-33/40 PGA CPU and 80386DX-33/40 PQFP CPU. The 80386DX is an advanced 32-bit microprocessor designed for applications needing very high performance optimized for multitasking operation systems. The 32-bit registers and data paths support 32-bit addresses and data types. The processor addresses up to fourgigabytes of physical memory and 64terabytes of virtual memory. the integrated memory management and protection architecture includes address translation registers, advanced multitasking hardware, and a protection mechanism tosupport these operating systems. In addition, the 80386DX allows the simultameous operation of multiple operating systems. Instruction pipelining, on chip address translation, and highbus bandwidth ensure short average instruction execution times and high system throughput.

The Cyrix Cx486DLC microprocessor is an advanced 32-bit X86 compatible processor offering high performance and integrated power management on a single chip. The CPU is 486SX instruction set compatible and is backward compatible with the 386DX pinout.
The CPU supports 8,16 and 32-bit data types and operates in real,virtual 8086 and protected modes. The Cx486DLC supports up to 4 GBytes of physical memory. The Cx486DLC includes a single cycle execution unit and a 32-bit internal data path that couple tightly to the on-chip 1 KByte cache. This enables the Cx486DLC to effectively access the cache two clocks faster than a zero wait-state external bus access.

2-2
MATH
COPROCESSOR

The numeric coprocessor socket on the 333UC/340UC/333UCB/340UCB system board is designed for a 25, 33 or 40 MHz Intel 80387, or compatible, coprocessor, such as a Cyrix, ULSI, or Weitek 3167.

A numeric coprocessor can often be installed even after the main board has been set in its system case. Make sure that any coprocessor, other than Weitek, is the same size and is compatible with the Intel 387 chip. the Intel chip uses 68 round pin holes only, while the Weitek chip uses all 121 pin holes.
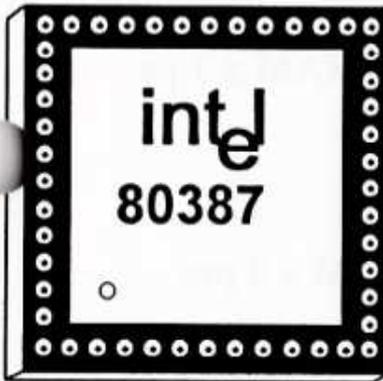
Since both types have many pins, you must be careful to maintain the correct orientation of the chip and to avoid any misalignement of pins with pin holes when you plug the chip in. You are encouraged to have the chip installed professionally. If you choose to install the coprocessor yourself, be sure to follow the safety precautions against static electricity discharge outlined in Section 3.1.

After you disconnect your system from its power source, open the system case, following the instructions in your system manual. As you examine the corpocessor socket you will notice the hollow square in its center; the notched corner of this square is the PIN1 corner of the socket. The top of the coprocessor chio has a similarly notched corner. Make sure these are aligned.

Note: Incorrect orientation of the coprocessor chip and to system board

2-3
MAIN
MEMORY

DRAM chips mounted as 30-pin or SIMMs (Single In-Line Memory Modules), are required for the 333UC/340UC/333UCB/340UCB mainboards. Various types of SIMM modules, shown below, are acceptable.
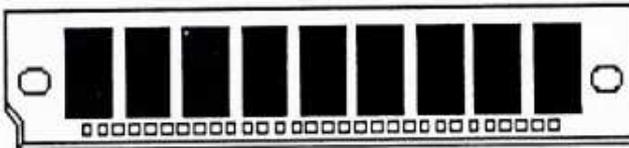
256K x 9-bit SIMM
256K by 1-bit DRAM x 9 pcs
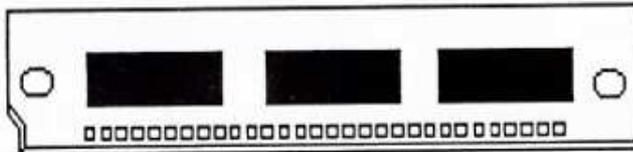
256K x 9-bit SIMM
256K by 4-bit DRAM x 2 pcs
(for 8-bit data)
+256K by 1-bit DRAM x 1 pc
(for parity-bit)
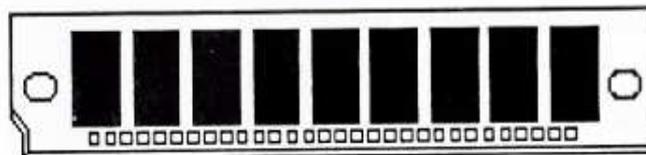
1M x 9-bit SIMM
1M by 1-bit DRAM x 9 pcs
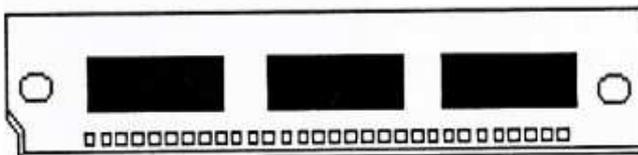
1M x 9-bit SIMM
1M by 4-bit DRAM x 2 pcs
(for 8-bit data) +
1M by 1-bit DRAM x 1 pc
(for parity-bit)
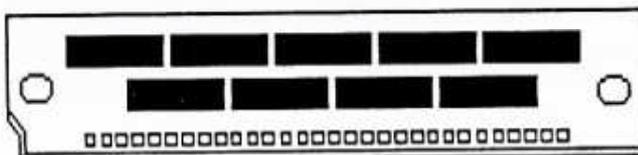
4M x 9-bit SIMM
4M by 1-bit DRAM x 8 pcs
(for 8-bit data)
+4M by 1-bit DRAM x 1 pcs
(for parity-bit)

Use 256KB/1MB/4MB RAM modules with 70ns or 80ns propagation delay time. Memory banks conform to the configuration displayed below.

BANK 0	BANK1	TOTAL MEMORY
256KBx4	0	1MB
256KBx4	256KBx4	2MB
256KBx4	1MBX4	5MB
1MBx4	0	4MB
1MBx4	1MBx4	8MB
1MBx4	4MBx4	20MB
4MBx4	0	16MB
4MBx4	4MBx4	32MB

DRAM Configuration Tables

BANK0
BANK0
BANK0
BANK0
BANK1
BANK1
BANK1
BANK1

2-4
THE UMC
82C481/C482/
82C206
CHIPSET

The 386 chipset from UMC allows the programming of many system board functions. The set comprises two VLSI (Very Large Scale Intergration) chips that enable the CPU and AT bus clock rates to be programmed as well as memory and I/O wait states. The shadow RAM capability can also be set. The Chipset consists of the:

82C481   Memory Controller
82C482   System Controller
82C206   Integrated Peripherals Controller

2-5
SHADOW RAM
& MEMORY
REMAPPING

The UMC 82C481 has built-in support for shadowing different areas of memory (which include System BIOS and Video BIOS).

The UMC 82C481 supports shadow RAM as one of the following four options:

OPTION	BIOS	BIOS ADDRESS	VIDEO	VIDEO ADDRESS
1	64K	0F0000-0FFFFF	0	
2	128K	0E0000-0FFFFF	0	
3	64K	0F0000-0FFFFF	64K	0C0000-0CFFFF
4	128K	0E0000-0FFFFF	128K	0C0000-0DFFFF

See Fig.2-1 (Page 18) for the System Memory Map.
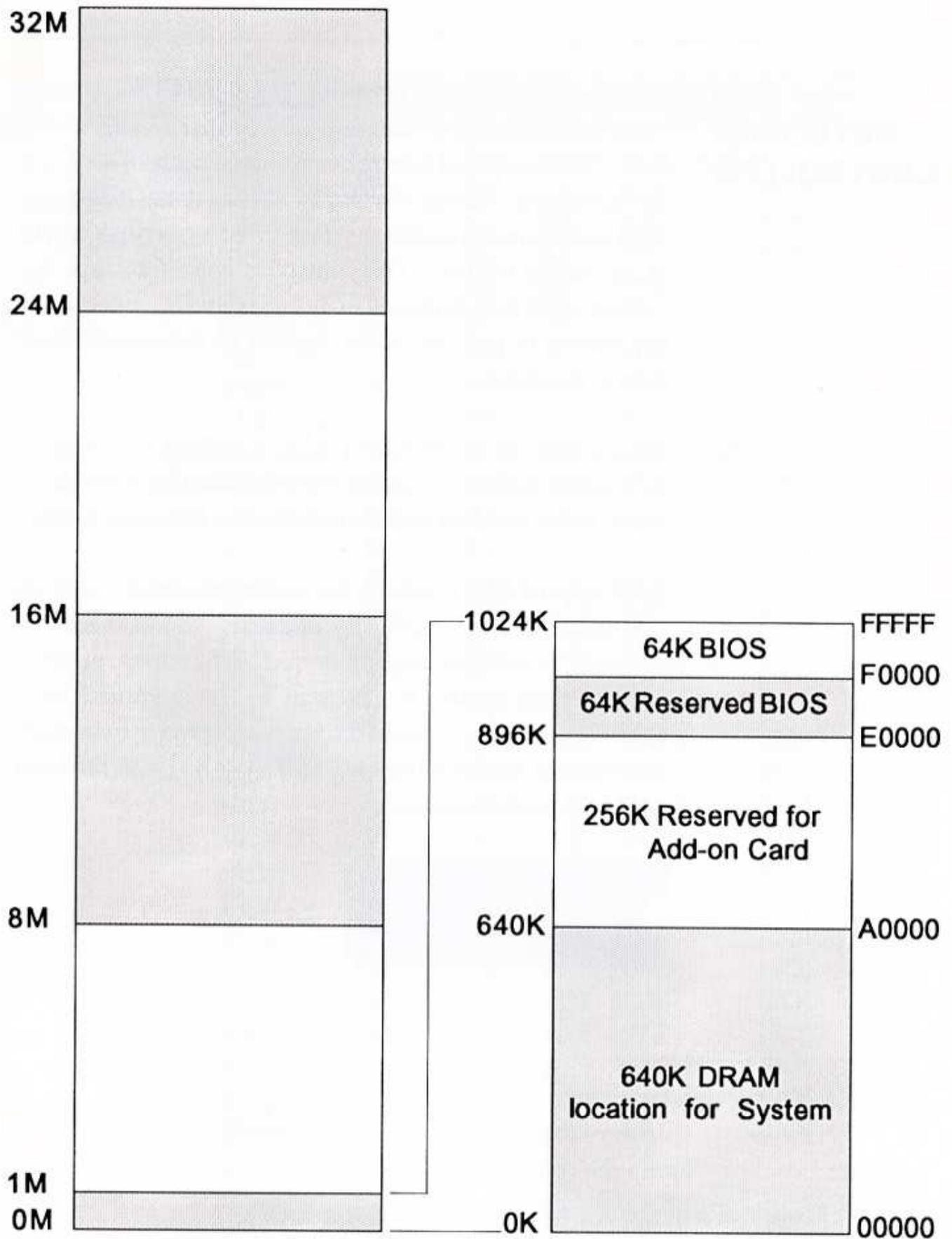
Fig. 2-1 System Memory Map

2-6
KEYBOARD
CONTROLLER

The keyboard controller is a single-chip 8042 microprocessor programmed to support the keyboard serial interface. The keyboard controller receives serial data from the keyboard, checks the parity of the data, translates scan codes, and presents the data to the system as a byte in its output buffer. The controller coan interrupt the system when data is placed in its output buffer, or wait for the system to poll its status register to determine when data is available.

Data is sent to the keyboard by first polling the controller's status register to determine when the imput buffer is ready to accept data and then writing to the input buffer.

Each byte of data is sent to the keyboard serially with an odd parity bit automatically inserted. the keyboard is required to acknowledge all data transmissions; another byte of data should not be sent to the keyboard until acknowledgment is received for the previous byte sent. the "output buffer full" interrupt may be used for both sent and receive routines.

8042

SIGNALS	I/O	PIN	NO.	SIGNALS	I/O
Ground		B1	A1	-I/OCHCK	[I]
Reset Drive	[O]	B2	A2	SD7	[I/O]
+5V DC		B3	A3	SD6	[I/O]
IRQ9	[I]	B4	A4	SD5	[I/O]
-5V DC		B5	A5	SD4	[I/O]
DRQ2	[I]	B6	A6	SD3	[I/O]
-12V DC		B7	A7	SD2	[I/O]
OWS	[I]	B8	A8	SD1	[I/O]
+12V DC		B9	A9	SD0	[I/O]
Ground		B10	A10	-I/OCh Rdy	[I]
-SMEMW	[O]	B11	A11	AEN	[O]
-SMEMR	[O]	B12	A12	SA19	[I/O]
-IOW	[I/O]	B13	A13	SA18	[I/O]
-IOR	[I/O]	B14	A14	SA17	[I/O]
-DACK3	[O]	B15	A15	SA16	[I/O]
DRQ3	[I]	B16	A16	SA15	[I/O]
-DACK1	[O]	B17	A17	SA14	[I/O]
DRQ1	[I]	B18	A18	SA13	[I/O]
-Refresh	[I/O]	B19	A19	SA12	[I/O]
CLK	[O]	B20	A20	SA11	[I/O]
IRQ7	[I]	B21	A21	SA10	[I/O]
IRQ6	[I]	B22	A22	SA9	[I/O]
IRQ5	[I]	B23	A23	SA8	[I/O]
IRQ4	[I]	B24	A24	SA7	[I/O]
IRQ3	[I]	B25	A25	SA6	[I/O]
-DACK2	[O]	B26	A26	SA5	[I/O]
T/C	[O]	B27	A27	SA4	[I/O]
BALE	[O]	B28	A28	SA3	[I/O]
+5V DC		B29	A29	SA2	[I/O]
OSC	[O]	B30	A30	SA1	[I/O]
Ground		B31	A31	SA0	[I/O]

Pin-Out specifications for 8-bit expansion slots

SIGNALS	I/O	PIN	NO.	SIGNALS	I/O
-MEM CS16	[I]	D1	C1	SBHE	[I/O]
-I/O CS16	[I]	D2	C2	LA23	[I/O]
IRQ10	[I]	D3	C3	LA22	[I/O]
IRQ11	[I]	D4	C4	LA21	[I/O]
IRQ12	[I]	D5	C5	LA20	[I/O]
IRQ15	[I]	D6	C6	LA19	[I/O]
IRQ14	[I]	D7	C7	LA18	[I/O]
-DACK0	[O]	D8	C8	LA17	[I/O]
DRQ0	[I]	D9	C9	-MEMR	[I/O]
-DACK5	[O]	D10	C10	-MEMW	[I/O]
DRQ5	[I]	D11	C11	SD8	[I/O]
-DACK6	[O]	D12	C12	SD9	[I/O]
DRQ6	[I]	D13	C13	SD10	[I/O]
-DACK7	[O]	D14	C14	SD11	[I/O]
DRQ7	[I]	D15	C15	SD12	[I/O]
+5V DC		D16	C16	SD13	[I/O]
-Master	[I]	D17	C17	SA14	[I/O]
Ground		D18	C18	SA15	[I/O]

Pin-Out specifications for16-bit expansion slots

3 INSTALLATION

This chapter provides information for you to set up a working system based on the 333UC/340UC/333UCB/340UCB mainboard. Before removing the board from its anti-static bag, please read the section below about static electricity precautions.

**3-1
STATIC
ELECTRICITY
PRECAU-
TIONS**

Static electricity is a constant danger to computer systems. The charge that can build up in your body may be more than sufficient to damage integrated circuits on the system board. It is, therefore, important to observe 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 always best to safeguard against accidental damage that may result in expensive repairs. The following measures should generally be sufficient to protect your equipment from static discharge:

• Touch a grounded metal object to discharge the static electricity in your body (or, preferably, wear a grounded wrist strap).

• When unpacking and handling the board and other system components, all materials should be placed on an anti-static surface.

• When handling individual cards, boards, or modules, be careful to avoid contact with the components on them, and also with the "golden finger" connectors that plug into the expansion bus.

3-2

PERIPHERALS REQUIRED

❏ Your 333UC/340UC/333UCB/340UCB mainboard.

❏ a chassis similar to the IBM Baby AT in size, or one with identical mounting holes.

❏ an IBM-AT power supply, or compatible; we recommend that you use at least a 200 Watt power supply.

❏ a disk controller card with 1:1 page interleave feature.

❏ an IBM-AT keyboard, or compatible.

❏ a 4.5V to 6V battery.

❏ at least one floppy disk drive [360KB, 720KB, 1.2MB, or 1.44MB].

❏ an IBM-AT display card: CGA, MDA, EGA, VGA, or compatible.

❏ a monitor that corresponds to the display card.

❏ a serial/parallel interface card.

❏ an external speaker.

❏ flat ribbon cables to connect the hard/floppy disk controller to the drives.

❏ MS-DOS version 3.3, or later, PC-DOS version 3.3, or later, or OS/2.

3-3
BUILDING UP
A SYSTEM

1) Install RAM SIMMs onto the mainboard (See Section 2-3).

2) Install any DIPs for cache memory (See Sections 1-4 for further information).

3) When fastening the mainboard to the case, make sure the proper length standoffs and phillips screws are used to insure the board is secure and level within the chassis.

4) Install an interface card.

5) Install an MDA, CGA, EGA, or VGA display card in its slot. The mainboard will sense whether the card is monochrome or color.

6) Plug the keyboard into the keyboard connector in the back of the system unit (Fig. 3-1).

7) Connect the monitor cable to the display card.

8) Connect the power supply connectors to PS1/PS2 (Fig. 3-2).

9) Install the disk controller card. Mount the disk drives into their respective frames. Connect the hard disk/ floppy disk ribbon cables from the drives to the controller card. Connect the disk drives to their power sources.

10) The 333UC/340UC/333UCB/340UCB has a rechargeable battery on board; however, a connector for an external backup battery (4.5V or 6V) "BATT" is provided.

11) For those who have the IBM PC/AT chassis, or equivalent, plug the speaker connector and the "Power LED and KEYLOCK" connectors into the front of the system unit.

12) Complete cable connections and jumper settings (See chapter 1 for Mainboard layout and section 1-3, for jumper and connector information).

PIN	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	SPARE
4	GROUND
5	+5VDC
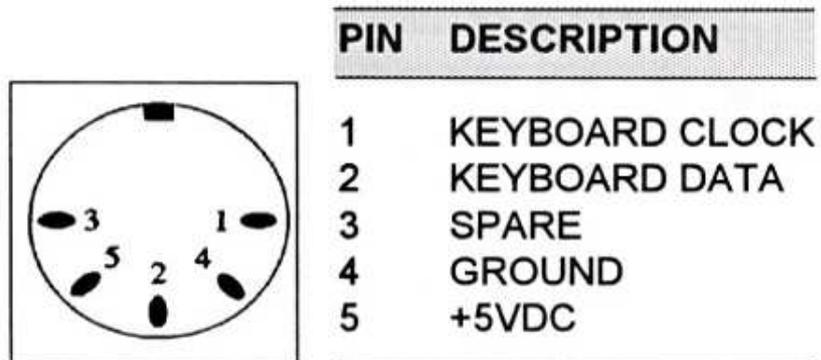
Figure 3-1 Keyboard Connector

1	■	POWER GOOD	Orange
2	■	+5V	Red
3	■	+12V	Yellow
4	■	- 12V	Blue
5	■	GROUND	Black
6	■	GROUND	Black
1	■	GROUND	Black
2	■	GROUND	Black
3	■	- 5V	White
4	■	+5V	Red
5	■	+5V	Red
6	■	+5V	Red

Figure3-2 Power Supply Connector

4 POWER-ON SELF TEST & ERROR MESSAGES

4-1 POWER-ON SELF TEST

The Power-On Self Test is a test that will self-diagnose everypart of your system automatically. It resides in the ROM-BIOS and whenever your system is reset, this test checks the CPU, memory, and those peripheral devices, such as keyboard, disk, or monitor

4-2 BIOS ERRORS AND MESSAGES

When BIOS self test encounters error, the system will offer either a few short beeps or an on-screen display error message. If the error is fatal, the system halts after reporting the message. If the error is non-fatal, the process will continue.

A. Fatal Errors Through Beeps

BEEP COUNT	IMPLICATION
1	DRAM refresh failure
2	Base 64KB RAM failure
4	System timer failure
5	Processor failure
6	Keyboard controller-gate A20 error
7	Virtual mode exception error
9	ROM-BIOS checksum failure

B.	MESSAGE	IMPLICATION
Fatal Errors Shown is Monitor	CMOS INOPERATIONAL	failure of CMOS shutdown register test
	8042 GATE-A20 ERROR	getting into protected mode
	INVALID SWITCH MEMORY FAILUER	failure in conversing memory type
	DMA ERROR	DMA controller page register test failed
	DMA #1 ERROR	DMA Unit 1 register test failed
	DMA #2 ERROR	DMA Unit 2 register test failed

C.	BEEP COUNT	IMPLICATION
Non-Fatal Errors Through Beeps	3	Conventional and extended memory test failure
	8	Display test failure and test of vertical & horizontal retrace failure

D.

Non-Fatal Errors in Monitor

Two types of Non-Fatal Errors are as follows:

BEEP COUNT	IMPLICATION
3	Conventional and extended memory test failure
8	Display test failure and test of vertical & horizontal retrace failure

D.1 Errors with Setup Option

MESSAGE	IMPLICATION
CMOS battery state low	failure of CMOS battery
CMOS system option not set	failure in set and checksum tests
CMOS checksum	CMOS battery failure low or failure in checksum tests
CMOS display type	failure of display verification
CMOS time & date not set	error in system configuration verification and setup error in timer

D.2 Errors Without Setup Option

MESSAGE	IMPLICATION
CH-2 timer error	channel 2, 1, 0, timer test failure
Keyboard error	keyboard test failure
KB/Interface error	keyboard test failure
Display switch setting not match	display type verification error
Keyboard is locked... Unlocked it	
FDD controller error	System Configuration verification error in Diskette setup
HDD controller error	System Configuration verification error in hard disk setup
C:DRIVE error	hard disk C setup error

5 AMI BIOS SETUP

```
┌─────────────────────────────────────────────────────────┐
│                                                           │
│            BIOS SETUP PROGRAM - STANDARD                  │
│    (C) 1991 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 │
└─────────────────────────────────────────────────────────┘
```

Figure 5-1 Setup Program Initial Screen

AMI BIOS is designed into the motherboard to allow users to configure their systems. At boot-up, after memory tests have been completed, press the **<DEL>** key. The above screen is displayed.

5-1 STANDARD CMOS SETUP Choose the **STANDARD CMOS SETUP** option from the **INITIAL SETUP SCREEN** Menu (Fig. 5-1) and the above screen is displayed. This standard Setup Menu allows users to configure such system components as date, time, hard disk drive, floppy drive, display, and memory. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

BIOS SETUP PROGRAM - STANDARD CMOS SETUP
(C) 1991American Megatrends Inc., All Rights Reserved

Date(mn/date/year) : Mon, Sep, 07 1992 Base memory size   :640 KB
Time(hour/min/sec) : 13:01:26   Ext. memory size   :3328KB
                                    Cyln Head WPcom LZone Sect Size

Hard disk C: type : Not Installed
Hard disk D: type : Not Installed
Floppy drive A :   : 1.2 MB, 5.25"

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Floppy drive B : : Not Installed	30	31	1	2	3	4	5
Primary display : VGA/PGA/EGA							
Keyboard : Installed	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
Month : Jan, Feb, ... Dec	20	21	22	23	24	25	26
Date : 01, 02, 03, ... 31							
Year : 1901, 1902, ... 2099	27	28	29	30	1	2	3
	4	5	6	7	8	9	10

ESC:Exit,:F2/F3:Color, PU/PD:Modify

Figure 5-2 CMOS Setup Screen

TYPE	CYLINDERS	HEADS	WRITE-PRECOMP	LANDING ZONE	CAPACITY (MBYTES)
1	306	4	128	305	10
2	615	4	300	615	20
3	615	6	300	615	31
4	940	8	512	940	62
5	940	6	512	940	47
6	615	4	65535	615	20
7	462	8	256	511	31
8	733	5	65535	733	30
9	900	15	65535	901	112
10	820	3	65535	820	20
11	855	5	65535	855	35
12	855	7	65535	855	50
13	306	8	128	319	20
14	733	7	65535	733	43
15	000	0	000	000	00
16	612	4	0000	663	20
17	977	5	300	977	41
18	977	7	65535	977	57
19	1024	7	512	1023	60
20	733	5	300	732	30
21	733	7	300	732	43
22	733	5	300	733	30
23	981	10	65535	981	81
24	925	7	0000	925	54
25	925	9	65535	925	69
26	754	7	754	754	44
27	754	11	65535	754	69
28	699	7	256	699	41
29	823	10	65535	823	68
30	918	7	918	918	53
31	1024	11	65535	1024	94
32	1024	15	65535	1024	128
33	1024	5	1024	1024	43
34	816	15	65535	816	191
35	1024	9	65535	1024	77

AMI Hard Disk Types Reference Table

TYPE	CYLINDERS	HEADS	WRITE-PRECOMP	LANDING ZONE	CAPACITY (MBYTES)
36	1024	8	512	1024	68
37	615	8	128	615	41
38	745	4	512	745	41
39	987	7	987	987	57
40	820	6	820	820	41
41	977	5	977	977	41
42	981	5	981	981	41
43	755	16	65535	755	100
44	887	13	65535	887	191
45	968	10	65535	968	161
46	751	8	0	751	50

5-2 ADVANCED CMOS SETUP

By choosing the **"ADVANCED CMOS SETUP"** option from the **INITIAL SETUP SCREEN** Menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

```
┌─────────────────────────────────────────────────────────────────────┐
│          BIOS SETUP PROGRAM - ADVANCED CMOS SETUP                     │
│      (C) 1991 American Megatrends Inc., All Rights Reserved           │
├─────────────────────────────────────────────────────────────────────┤
│ Typematic Rate Programming  : Disabled  │ Video   ROM Shadow  C400, 16K :Enabled  │
│ Typematic Rate Delay (msec) : 500       │ Adaptor ROM Shadow  C800, 16K :Disabled │
│ Typematic Rate (Chars/sec)  : 15        │ Adaptor ROM Shadow  CC00,16K :Disabled  │
│ Above 1 MB Memory Test      : Disabled  │ Adaptor ROM Shadow  D000, 16K :Disabled │
│ Memory Test Tick Sound      : Enabled   │ Adaptor ROM Shadow  D400, 16K :Disabled │
│ Memory Parity Error Check   : Enabled   │ Adaptor ROM Shadow  D800, 16K :Disabled │
│ Hit <DEL> Message Display   : Enabled   │ Adaptor ROM Shadow  DC00,16K :Disabled  │
│ Hard Disk Type 47 RAM Area  : 0:300     │ Adaptor ROM Shadow  E000, 64K :Disabled │
│ Wait For <F1> If Any Error  : Enabled   │ System  ROM Shadow  F000, 64K :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      │                                         │
│ Cache Memory                : Both      │                                         │
│ Gate A20 Emulation          : Both      │                                         │
│ Turbo Switch Function       : Enabled   │                                         │
│ Password Checking Option    : Setup     │                                         │
│ Video ROM Shadow C000, 16K  : Enabled   │                                         │
├─────────────────────────────────────────────────────────────────────┤
│ ESC        ↓→↑← : Exit:Sel (CTRL) PU/PD: modify   F1: Help  F2/F3: Color │
│ F5: Old Values          F6: BIOS Setup Defaults   F7: Power-on Defaults  │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 5-3 Advanced CMOS Setup Screen

**5-3
ADVANCED
CHIPSET
SETUP**

Choosing the **"ADVANCED CHIPSET SETUP"** optic from the **INITIAL SETUP SCREEN** menu, the following screen is displayed. This sample screen contains the manufacturer's default values for the motherboard.

```
BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP
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DRAM Page Mode              :  Disabled
Fast Page Mode DRAM         :  Enabled
DRAM Write WS Options        :  i
Memory Remapping            :  Enabled
Non-Cacheable Block1 Enable  :  Disabled
Non-Cacheable Block-1 Size   :  1MB
Non-Cacheable Block-1 Base   :  0KB
Non-Cacheable Block2 Enable  :  Disabled
Non-Cacheable Block-2 Size   :  16MB
Non-Cacheable Block-2 Base   :  0KB




  ESC: Exit:Sel     ↓→↑← (CTRL) PU/PD: Modify     F1:  Help  F2/F3:  Color
  F5:  Old Values           F6:  BIOS Setup Defaults    F7:  Power-on Defaults
```

Figure 5-4 Advanced Chipset Setup Screen

Note 1: This BIOS automatically detects the CPU speed. It will auto-configurate the bus clock, DRAM speed, cache read/write cycle for an optimized setup.

5-4 AUTO CONFIGURA- TION WITH BIOS DEFAULTS

"AUTO CONFIGURATION WITH BIOS DE- FAULTS" loads the default system values directly from ROM. If the stored record created by the Setup program becomes corrupted (and therefore unusable), these de- faults will load automatically when you turn the computer on.

```
┌─────────────────────────────────────────────────────────┐
│  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           │
│                                                          │
│  ┌───────────────────────────────────────────────────┐  │
│  │ Load BIOS Setup Default Values from ROM Table (Y/N) ? N │  │
│  └───────────────────────────────────────────────────┘  │
│                                                          │
│                                                          │
├─────────────────────────────────────────────────────────┤
│ Load BIOS Setup Default VAlues for Advanced CMOS and Advanced CHIPSET Setup │
│  ESC: Exit      ↓ → ↑ ←   :Sel    F2/F3: Color    F10: Save & Exit │
└─────────────────────────────────────────────────────────┘
```
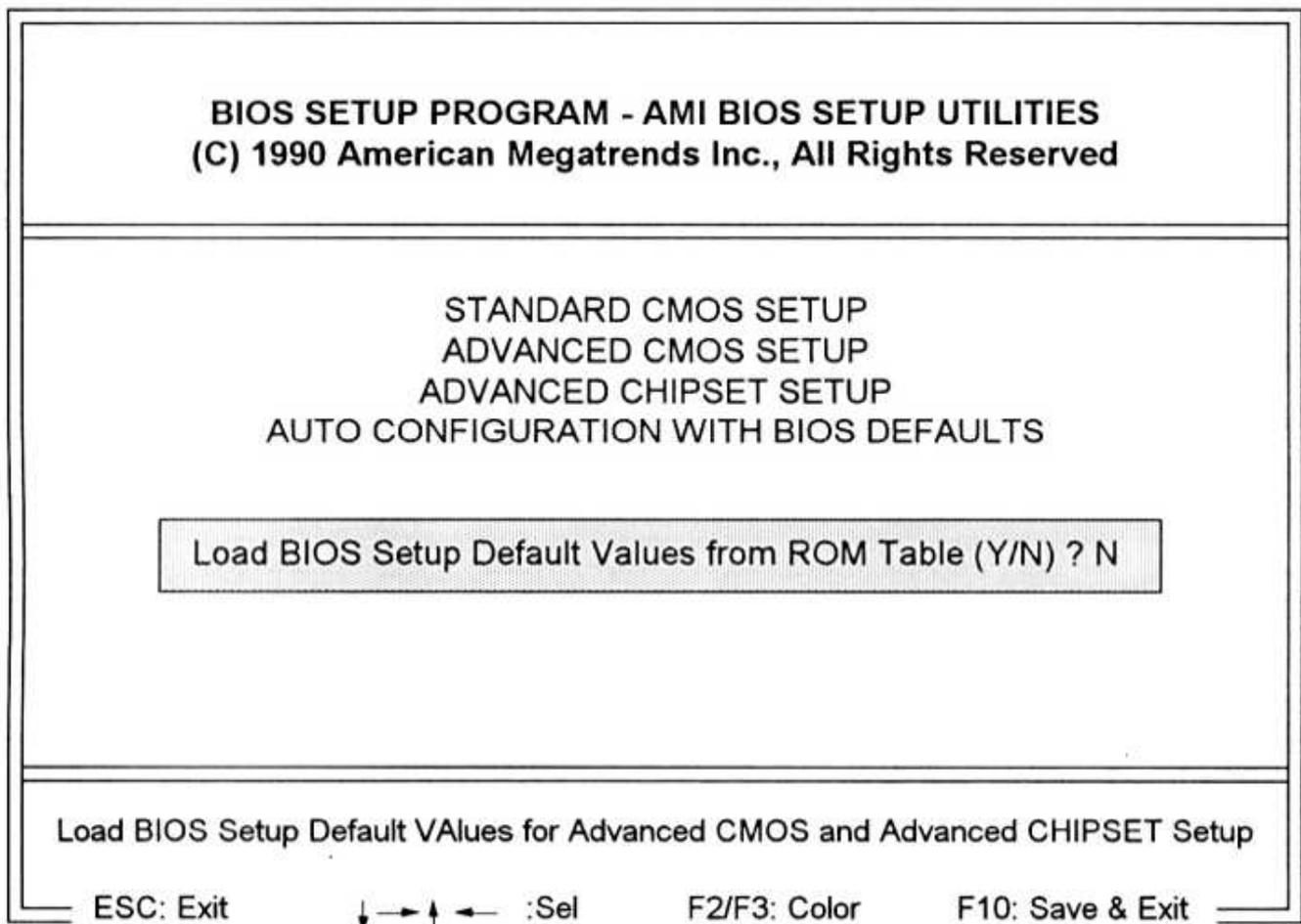
Figure 5-5 Auto Configuration with BIOS Defaults Screen

5-5 AUTO CONFIGURATION WITH POWER-ON DEFAULTS

The **"AUTO CONFIGURATION WITH POWER-ON DEFAULTS"** loads the settings detected when you turn on the computer. If your system is behaving erratically you can use this feature to check for incorrect settings.
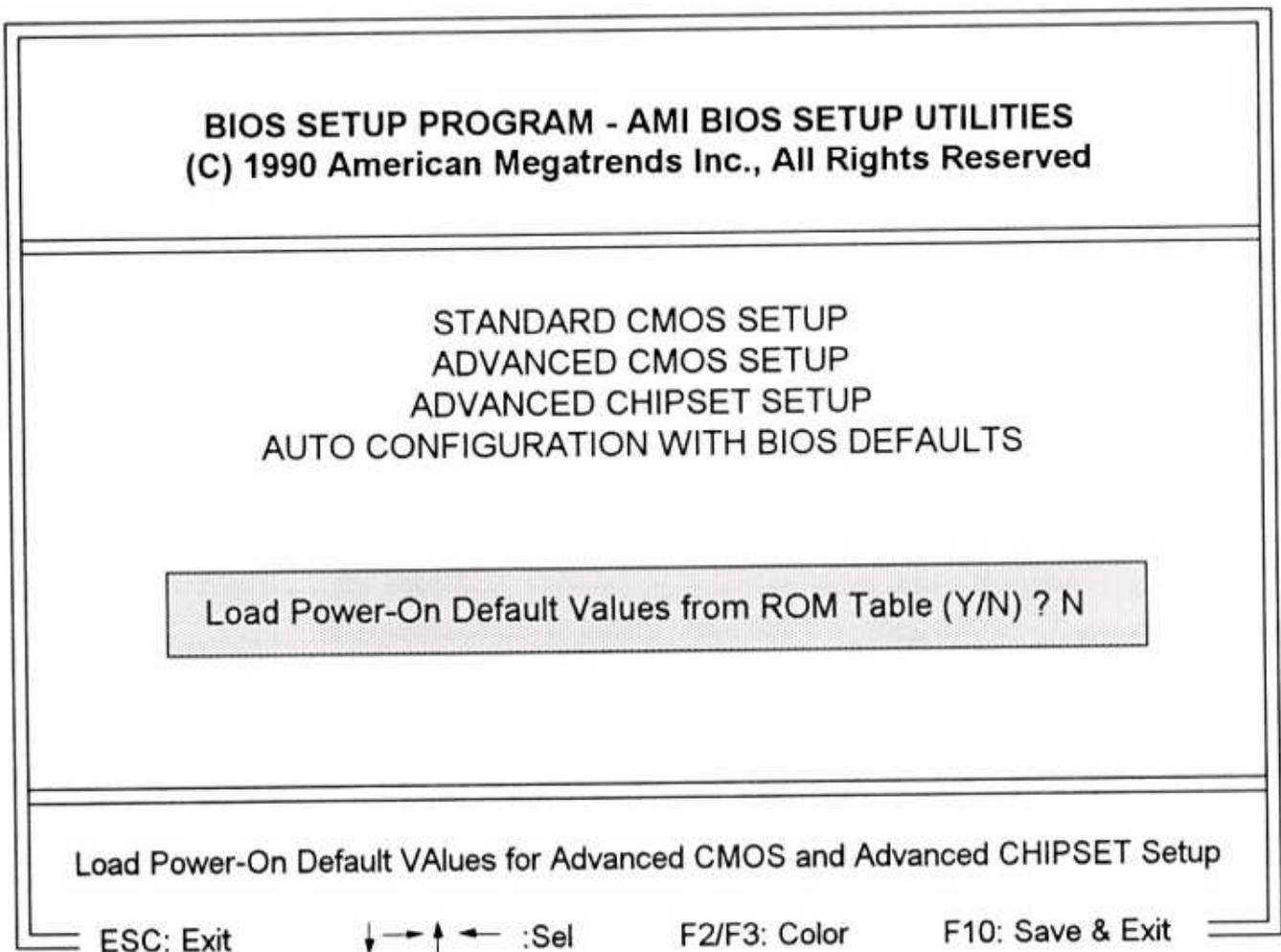
```
┌─────────────────────────────────────────────────────────────┐
│                                                             │
│        BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES        │
│     (C) 1990 American Megatrends Inc., All Rights Reserved  │
├─────────────────────────────────────────────────────────────┤
│                                                             │
│                  STANDARD CMOS SETUP                        │
│                  ADVANCED CMOS SETUP                        │
│                  ADVANCED CHIPSET SETUP                     │
│           AUTO CONFIGURATION WITH BIOS DEFAULTS            │
│                                                             │
│                                                             │
│    ┌───────────────────────────────────────────────────┐   │
│    │ Load Power-On Default Values from ROM Table (Y/N) ? N │   │
│    └───────────────────────────────────────────────────┘   │
│                                                             │
├─────────────────────────────────────────────────────────────┤
│ Load Power-On Default VAlues for Advanced CMOS and Advanced CHIPSET Setup │
│                                                             │
│  ESC: Exit      ↓─►↑◄─ :Sel    F2/F3: Color   F10: Save & Exit │
└─────────────────────────────────────────────────────────────┘
```

Figure 5-6 Auto Configuration with Power-On Defaults

**5-6
CHANGE
PASSWORD**

To change the password, choose the **"CHANGE PASS-WORD"** option form the Setup main menu and press [Enter].

1. If the CMOS is bad or this option has never been used, there is default password which is stored in the ROM. The screen will display the following messages:

Enter ROM Password:

Press the [Enter] key and continue to change the password.

2. If the CMOS is good or this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

Enter Current Password:

Enter the correct password and continue to change the password.

3. After pressing the [Enter] key (ROM password) or current password (user-defined password), you can change the password stored in the CMOS. The passord can be at most 6 characters long.

Remember, to enable this feature. You must first select the "Password Checking Option" either "Setup", or "Always" in the ADVANCED CMOS SETUP.

5-7
HARD DISK
UTILITY

"HARD DISK UTILITY" This utility is basic drive setup software. All of the options are destructive to data existing on a disk and are used for low-level formatting before the DOS "FDISK" and "FORMAT", or similar utilities. You can use this utility on MFM encoded hard drives if they require but have not been low-level formatted by the manufacturer. IDE, ESDI and SCSI drives don't need this utility and you should not use it on them.

Note: The hard disk type should be set in the STANDARD CMOS SETUP. Using the HARD DISK UTILITY is destructive to existing data on a disk.

BIOS SETUP PROGRAM - HARD DISK UTILITIES
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	Cyln	Head	WPcom	LZone	Sect	Size (MB)
Hard Disk C: Type : 37	615	8	128	615	17	41
Hard Disk D: Type : 37	615	8	128	615	17	41

Hard Disk Type can be changed from the STANDARD CMOS SETUP option in Main Menu

```
Hard Disk Fomat
```
Auto Inter Leave
Media Analysis

ESC: Exit   ↓ → ↑ ←   :Sel   F2/F3: Color

Figure 5-7 Hard Disk Utility

5-8
WRITE TO CMOS AND EXIT

"WRITE TO CMOS AND EXIT". If you select this and press the [enter] key the values entered in the setup utilities will be recorded in the CMOS memory of the chip set. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

5-9
DO NOT WRITE TO CMOS AND EXIT

"DO NOT WRITE TO CMOS AND EXIT" Selecting this option and pressing the [Enter] key lets you exit the Setup program without recording any new values or changing old ones.