GA - 486VS / 486VF

USER'S MANUAL

(GREEN SOLUTION)

VL-Bus 486DX / DX2 / SX / S-Series / OverDrive / P24T / DX4 Mainboard

Rev. 8B Eighth Edition

Addendum

To correctly configure your system for an AMD 486 DX2-80 CPU. The "Chipset Features Setup", In the BIOS setup utilities, must be set to BIOS Defaults(F6).

If the Auto Configure utility is "enabled" for an AMD 486 DX2-80, memory errors may occur.

Note: If you use AMD DX2-80 3.3V CPU, PLS check the following.

1. Take out the Jumpers on JP36 & JP37.
2. Make sure loading BIOS Default only for AWARD Aug/01/94" BIOS.
   AWARD BIOS which is newer than Aug/01/94" can support loading Set
   Up Default.
3. We support AMD DX2-80 3.3V CPU from P.C.B. REV.8A with blue wire on the back side & P.C.B. REV.8B.

✵ All of the items or discription regarding DX4 CPU in this manual don't support for those motherboards without 3.3V regurator.

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1.INTRODUCTION

1.1.PREFACE

Welcome to use the GA-486VF/486VS motherboard. The motherboard is a 64 KB - 512 KB CACHE 486DX PC/AT compatible system with ISA bus and VESA LOCAL BUS (VL-Bus), and has been designed to be the fastest 486 PC/AT system and the GREEN FUNCTION (Power-Down Mode) had be added. There are some new features allow you to operate the system with just the performance you want.

This manual also explains how to install the motherboard for operation, and how to set up your CMOS CONFIGURATION with BIOS SETUP program.

1.2.KEY FEATURES

- 80486 based PC/AT compatible mainboard with VL-Bus.
- 3 VL-Bus slots.
- Supports 486DX/DX2/SX/S-Series/OverDrive/P24T/DX4 running at 25-100 MHz.
- Supports True Green Function.
- Supports Intel, AMD and Cyrix CPU.
- Supports 237 pin (Socket 3) ZIF White socket / LIF socket on board.
- Supports 64 / 128 / 256 / 512 KB 2nd cache memory operated in BURST mode.
- Write-Back cache operation.
- Supports 1 - 128 MB DRAM memory on board.
- Supports 256 KB DRAM re-map function.

- ❑ Supports shadow RAM for BIOS & VIDEO BIOS.
- ❑ Supports shadow RAM cacheable function to improve performance.
- ❑ Supports H/W & S/W speed change function.
- ❑ Licensed AWARD BIOS.
- ❑ Ni-HY Rechargeable battery on board.
- ❑ 2/3 BABY AT size (22 cm x 25 cm) with 6 AT slots, 1 XT slot.

1.3.PERFORMANCE LIST

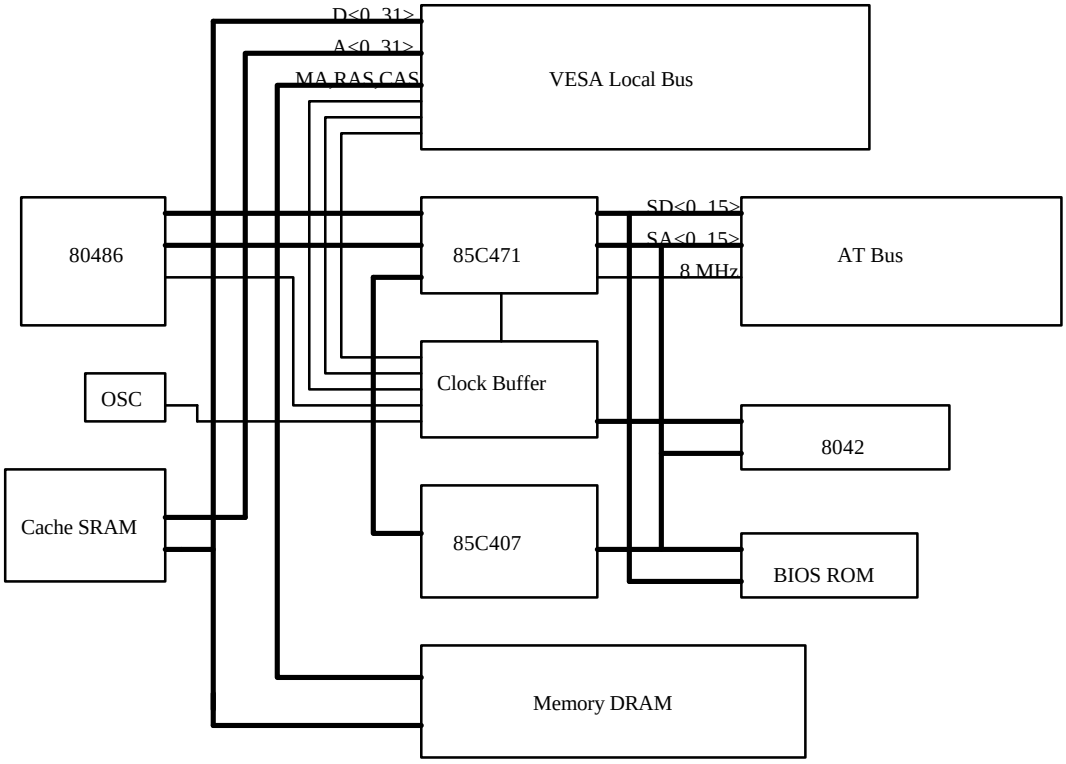
The following performance data list is the testing results of some popular benchmark testing programs. These data are just referred by users, and there is no responsibility for different testing data values gotten by users.(The different H/W & S/W configuration will result in different benchmark testing results.)

CPU	Intel 486DX4-100,DX4-75,DX2-66/50,DX-50/33,AMD486DX-40
DRAM	8 MB - 70 ns
DISPLAY	GA-302 S3 805 GUI VGA
H.D.D.	GA-403 VL-Bus SCSI
O.S.	MS-DOS 6.2
CACHE SIZE	256 KB

Software	Ver.	Item	Unit	DX4-100 (50 x 2)	DX4-100 (33.3 x 3)	DX4-75 (40 x 2)	DX4-75 (25 x 3)
LandMark	1.14	CPU	MHz	200+	200+	200+	200+
LandMark	2.0	CPU	MHz	363.42	363.21	290.66	272.40
		FPU	MHz	853.96	853.46	682.95	640.08
SI	7.0	CPU		198.1	198.0	158.4	148.5
Benchmark	8.0	Processor Score		58.55	60.08	46.54	44.82
PM	1.7	Mips	Mips	35.8	33.3	28.4	24.8
		Dhrystone	K-Dstone/s	47.6	45.0	37.9	33.8
		Whetstone	K-Wstone/s	9993.1	9702.1	7994.5	7294.3
Byte	2.1	CPU	AT Class	16.13	15.39	12.90	11.54
			386 Class	5.80	5.51	4.64	4.13
		FPU	AT Class	98.88	98.82	79.08	74.12
			386 Class	13.83	13.83	11.06	10.37

Software	Ver.	Item	Unit	DX2-66	DX-50	DX-40	DX2-50	DX-33
LandMark	1.14	CPU	MHz	200+	200+	182.3	200+	151.9
LandMark	2.0	CPU	MHz	222.97	167.32	133.81	167.22	111.47
		FPU	MHz	568.36	426.52	341.10	426.69	284.16
SI	7.0	CPU		144.0	108.0	86.4	108.0	72.0
Benchmark	8.0	Processor Score		44.62	35.28	28.22	33.37	25.17
PM	1.7	Mips	Mips	28.4	22.1	17.7	21.4	14.8
		Dhrystone	K-Dstone/s	36.5	28.4	22.7	27.3	19.0
		Whetstone	K-Wstone/s	6618.0	4996.6	3981.3	4971.7	3320.0
Byte	2.1	CPU	AT Class	12.13	10.98	8.77	9.05	8.24
			386 Class	4.57	4.29	3.42	3.41	3.29
		FPU	AT Class	65.92	49.47	39.56	49.44	32.96
			386 Class	9.22	6.92	5.54	6.92	4.61

1.4.BLOCK DIAGRAM



1.5.INTRODUCE THE VL-BUS

Connecting devices to a CPU local bus can dramatically increase the speed of I/O-bound peripherals with only a slight increase in cost over traditional systems. This price/performance point has created a vast market potential for local bus products. The main barrier to this market has been the lack of an accepted standard for local bus peripherals. Many mainboard and chipset manufactures developed their own local bus implementations, but they are incompatible with each other. The Video Electronics Standards Association (VESA) VL-Bus specification was created to end this confusion.

The VL-Bus standard, under development since November 1991, is designed to bring workstation-level performance to a standard PC platform. The VL-Bus removes many of the bottlenecks that have hampered PCs for several years. On the VL-Bus, peripherals operate at the native speed of the computer system, thus enabling data transfer between peripherals and the system at maximum speed. This performance is critical for bandwidth-constrained devices such as video, multimedia, mass storage, and networking adapters.

VESA's VL-Bus standard provides end-users with a low-cost, extendible, and portable local bus design, which will allow systems and peripherals from different manufactures to work seamlessly together.

2.SPECIFICATION

2.1.HARDWARE

- CPU
  - 80486SX/DX/DX2/S-Series, 80487SX, OverDrive, P24T, DX4.
  - 237 pin (Socket 3) ZIF white socket / LIF socket on board.
- COPROCESSOR
  - 80387DX included in 80486DX.
- SPEED
  - 25 / 33 / 40 / 50 MHz system and VL-Bus speed.
  - 8 MHz (programmable) AT Bus speed.
  - H / W and S / W speed switchable function (cache or non-cache).
- GREEN FUNCTION
  - Power Down Timer from 10 sec. to 10 mins.
  - When enter Power Down Mode, 8 MHz system speed for non S-Series and 0 MHz system speed for S-Series.
  - Ext. Power Control Port for Monitor Power ON / OFF
  - Support IDE Hard Disk Standby Mode control.
  - Wake Up by all IRQ and DMA, Local Bus Master and Device Cannel.
  - Support Green LED Indicator and Green Switch.
- DRAM MEMORY
  - 2 banks 30 pins SIMM module sockets on board for 486VF.
  - 8 banks 72 pins SIMM module sockets on board for 486VS.
  - Use 256 KB / 1 / 4 / 16 MB 70 ns SIMM module DRAM for 486VF.
  - Use 256 KB / 1 / 2 / 4 / 8 / 16 / 32 MB 70 ns SIMM module DRAM for 486VS.
  - Support Fast Page DRAM access mode.
- CACHE MEMORY
  - 8 KB cache memory included in 80486 DX / SX.
  - 16 KB cache memory included in DX4.
  - 64 / 128 / 256 / 512 KB 2 cache memory on board.
  - Support 486 Burst mode on 2nd cache memory access.
- SHADOW RAM
  - Main BIOS shadow function programmable.
  - Video BIOS shadow function programmable.
  - Shadow RAM cacheable function programmable.

- RE-MAP DRAM – 256 KB DRAM re-locatable.
- I/O BUS SLOTS – 3 VL-Bus.
  – 6 AT Bus, 1 XT Bus.
- DIMENSION – 2/3 Baby AT size (25 cm x 22 cm).

2.2.SOFTWARE

- BIOS – Licensed AWARD BIOS.
  – AT CMOS Setup, Advanced / Chipset Setup, Power Management and Hard Disk Utility included.
- O. S. – Operation with MS-DOS, OS/2 NOVELL, SCO UNIX.

2.3.ENVIRONMENT

- AMBIENT TEMP. – 0 to +50°C (operating).
- RELATIVE HUM. – 0 to +85% (operating).
- ALTITUDE – 0 to 10,000 feet (operating).
- VIBRATION – 0 to 1,000 Hz.
- ELECTRICITY – 4.9 V to 5.2 V.
  – 3 A to 5 A current.

3.HARDWARE INSTALLATION

3.1.UNPACKING

The mainboard package should contain the following:

- The GA-486VF/486VS mainboard
- User's manual

The mainboard contains sensitive electric components which can be easily damaged by static electricity, so the mainboard should be left in its original packing until it is installed.

Unpacking and installation should be done on a grounded anti-static mat. The operator should be wearing an anti static wristband, grounded at the same point as the anti-static mat.

Inspect the mainboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there are no shipping and handling damages on the board before proceeding.

After opening the mainboard carton, extract the system board and place it only on a grounded anti-static surface component side up. Again inspect the board for damage. Press down on all of the socket IC's to make sure that they are properly seated. Do this only on with the board placed on a firm flat surface.

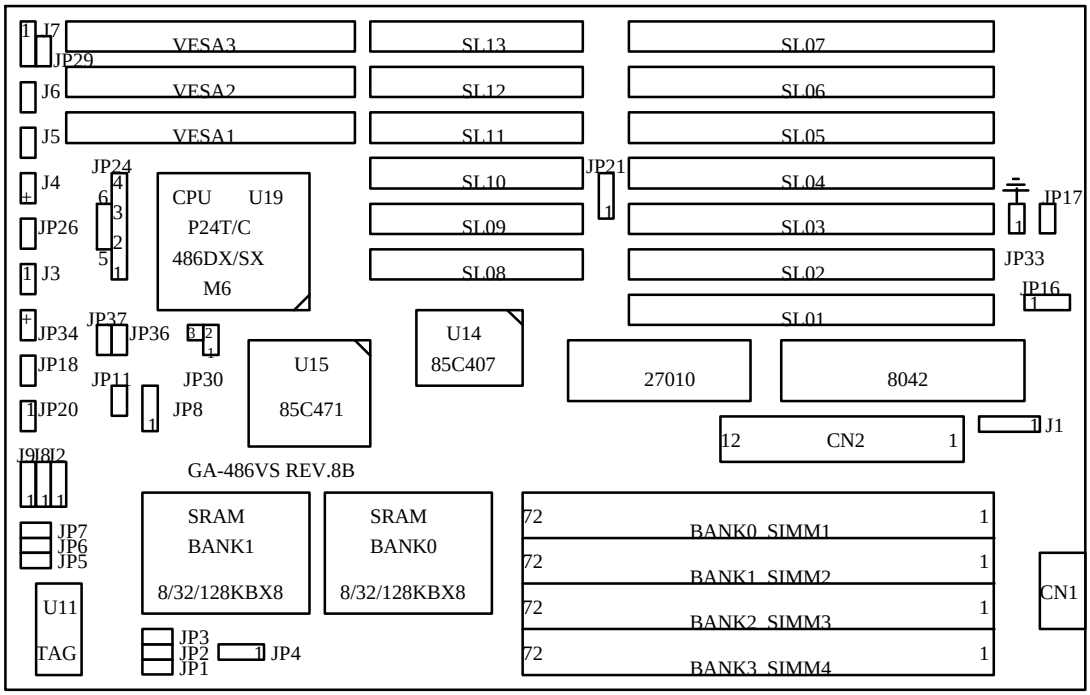
DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

You are now ready to install your maniboard. The mounting hole pattern on the mainboard matches the IBM-XT system board. It is assumed that the chassis is designed for a standard IBM XT/AT mainboard mounting.

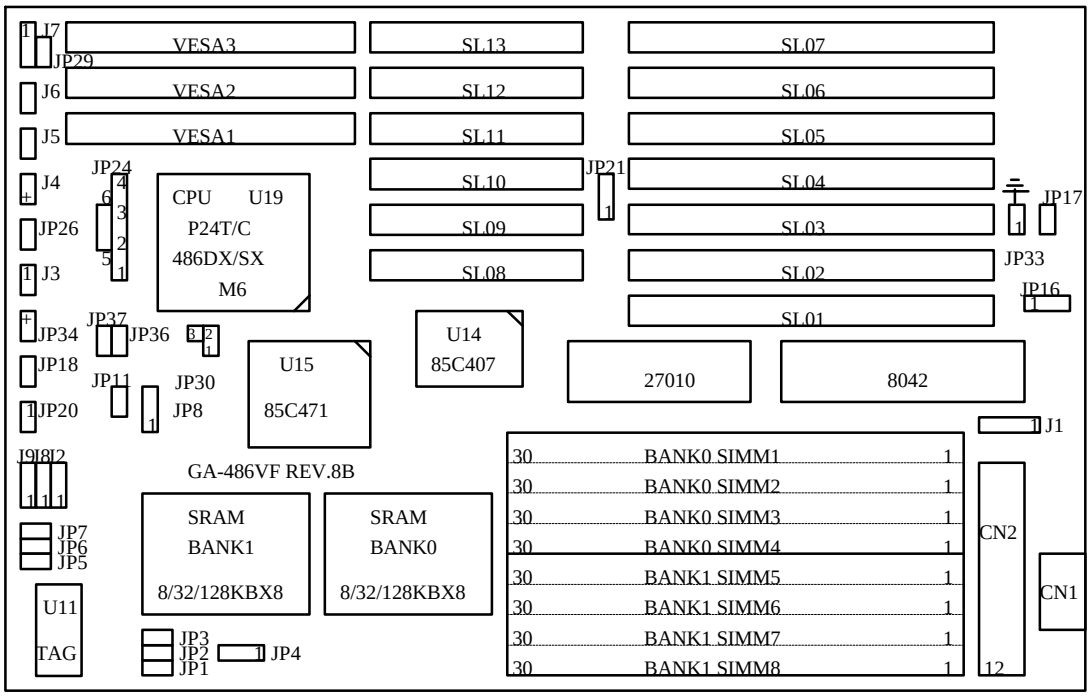
Place the chassis on the anti-static mat and remove the cover. Take the plastic clips, Nylon stand-off and screws for mounting the system board, and keep them separate.

3.2.MAINBOARD LAYOUT

≺GA-486VS≻



≺GA-486VF≻



3.3.QUICK REFERENCE FOR JUMPERS & CONNECTORS

♦ J5: Speaker Connector	
1	Data
2	GND
3	GND
4	VCC (+5V)

♦ J7: Power LED & Key-Lock Connector	
1	LED Anode (+)
2	NC
3	LED Cathode (-)
4	Key-Lock
5	GND

♦ J6: Reset Connector	
Open	For Normal Operation
Close	For Hardware Reset System

♦ J4: TURBO LED Connector	
1	LED Anode (+)
2	LED Cathode (-)

♦ J3: TURBO Switch Connector	
2-3	For High Speed
1-2	For Low Speed (1/3 Speed)

♦ J1: External Battery Connector	
1	Battery Anode (+)
2	NC
3	GND
4	Battery Cathode (-)

♦ JP10: AMD CPU Selection Jumper	
Open	AMD DXL CPU X 3
Short	AMD DXL CPU X 2

This option is supported from PCB Rev. 8B.

♦ CN1: Keyboard Connector	
1	Keyboard Clock
2	Keyboard Data
3	NC
4	VCC (+5V)
5	GND

♦ CN2: Power Connector	
1	Power Good Signal
2,10,11,12	VCC (+5V)
3	(+12V)
4	(-12V)
5,6,7,8	GND
9	(-5V)

♦ JP1 ~ JP4: SRAM Size Setup Jumpers

JP. No	64 KB	128 KB	256 KB	256 KB✶	512 KB
JP1	OFF	ON	ON	ON	ON
JP2	OFF	OFF	ON	ON	ON
JP3	OFF	OFF	OFF	OFF	ON
JP4		1-2	2-3	1-2	1-2

✶ Using 64 KB x 8 SRAM from U1 to U4.

♦ JP8: CPU Type Selection Jumper	
Pin No	Function
1-2	Close for 80486DX2, DX or OverDrive Installed.
2-3	Close for 80486SX Installed.

♦ JP11: AMD CPU Selection Jumper	
Pin No	Function
1-2	Close for Non AMD CPU Selection.
	Open for AMD CPU Selection.

♦ JP18: Cyrix CPU Selection	
Open	For Cyrix CPU installed.
Close	For normal operation.

♦ JP20: Delay CPU Clock	
Pin No	Function
1-2	For some VL-Bus interface card that need more address hold time in DX4-100, DX4-75 or DX2-50. If you don't have any problem, please always keep the jumper pin 2-3 short.
2-3	Close for normal operation.

♦ JP21: Cyrix & P24D CPU Selection	
Pin No	Function
1-2	Cyrix CPU, P24D ✶ P24D is suppored from PCB REV.8A & BIOS July, 12 1994 or later.
2-3	Others.

✶ This option is valued from Rev.6.

♦ JP24: DX4 & Cyrix & P24D CPU Selection	
Pin No	Function
3-4	"Open" for DX4 CPU x 3, "Close" for DX4 CPU x 2.
2-3	Close for Cyrix CPU. ✶ This option is valued from Rev.6.
2-5	Close for P24D. ✶ P24D is suppored from PCB REV.8A & BIOS July, 12 1994 or later.

♦ JP36 ~ JP37: CPU Voltage Selection		
JP36	JP37	Function
Close	Close	For 5 Voltage CPU.
Open	Open	For 3.3 Voltage DX4 CPU.

♦ JP5 ~ JP7: Clock Generator Frequency Setup				
JP No	50 MHz	40 MHz	33 MHz	25 MHz
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON

♦ JP16: CMOS Clear / Power Supply Jumper	
Pin No	Function
1-2	Close for Normal Operation.
2-3	Close for Not Supplying Power to CMOS RTC (Clear).

♦ JP29: VL-Bus Speed Configuration	
Close	For DX-50 / 40 MHz.
Open	For Other Speed.

✶ JP29 is default to be closed for safety reason. If your system is 33MHz or below and some of your VL - BUS interface card have to monitor this jumper to identify system speed, this is the only case that you have to open the jumper.

♦ JP30: AMD CPU Selection Jumper	
1-2	AMD DXL CPU X 3
2-3	AMD DXL CPU X2

✶ This option is valued from P.C.B. REV.8B.

♦ J2, J8, J9: Delay Local Bus Clock	
Pin No	Function
1-2	For normal operation.
2-3	For some VL-Bus interface card that need more address setup time in DX4-100, DX4-75, DX2-66, DX-50, DX-40 or DX-33.

J2 is for VESA1 slot. J8 is for VESA2 slot. J9 is for VESA3 slot. If you don't have any problem, please always keep these jumpers pin 1-2 short.

♦ JP33: External Power Control Port	
Pin No	Function
1	Control Signal (Low Level for Enter Power Down Mode).
2	Signal Ground (GND).

♦ JP26: Green Switch	
Open	For normal operation.
Close	To get into Green mode.

♦ JP34: Green LED Connector	
1	LED Anode (+).
2	LED Cathode (-).

♦ JP17: Display Type Setup Jumper	
Close	For CGA.
Open	For Others

3.4.DRAM INSTALLATION

GA-486VF can be installed with 256 KB, 1, 4 or 16 MB 30 pins SIMM module DRAM and GA-486VS can be installed with 256 KB, 1, 2, 4, 8, 16 or 32 MB 72 pins SIMM module DRAM. The DRAM speed of both mainboard is using 70 ns. The banks of memory system on GA-486VF or GA-486VS consists from bank 0 to bank 1 or from bank 0 to bank 3 respectively. The DRAM of bank 0 must be installed first, then bank 1. The total memory size is from 1 to 128 MB, and various configuration of DRAM types in the following table are available.

≺For GA-486VS≻

Bank 0	Bank 1	Bank 2	Bank 3	Total
256KB x 32/36 - S				1 MB
256KB x 32/36 - S	256KB x 32/36 - S			2 MB
256KB x 32/36 - S	256KB x 32/36 - S	512KB x 32/36 -D		4 MB
256KB x 32/36 - S	256KB x 32/36 - S	1MB x 32/36 - S		6 MB
256KB x 32/36 - S	256KB x 32/36 - S	512KB x 32/36 - D	1MB x 32/36 - S	8 MB
256KB x 32/36 - S	256KB x 32/36 - S	1MB x 32/36 - S	1MB x 32/36 - S	10 MB
256KB x 32/36 - S	256KB x 32/36 - S	4MB x 32/36 - S		18 MB
512KB x 32/36 - D				2 MB
512KB x 32/36 - D	512KB x 32/36 - D			4 MB
512KB x 32/36 - D	1MB x 32/36 - S			6 MB
512KB x 32/36 - D	512KB x 32/36 - D	1MB x 32/36 - S		8 MB
512KB x 32/36 - D	512KB x 32/36 - D	1MB x 32/36 - S	1MB x 32/36 - S	12 MB
512KB x 32/36 - D	4MB x 32/36 - S			18 MB
512KB x 32/36 - D	512KB x 32/36 - D	4MB x 32/36 - S		20 MB
512KB x 32/36 - D	512KB x 32/36 - D	1MB x 32/36 - S	4MB x 32/36 - S	24 MB
512KB x 32/36 - D	512KB x 32/36 - D	4MB x 32/36 - S	4MB x 32/36 - S	36 MB
1MB x 32/36 - S				4 MB
1MB x 32/36 - S	1MB x 32/36 - S			8 MB
1MB x 32/36 - S	1MB x 32/36 - S	1MB x 32/36 - S		12 MB
1MB x 32/36 - S	1MB x 32/36 - S	1MB x 32/36 - S	1MB x 32/36 - S	16 MB
1MB x 32/36 - S	4MB x 32/36 - S			20 MB
1MB x 32/36 - S	1MB x 32/36 - S	4MB x 32/36 - S		24 MB
1MB x 32/36 - S	4MB x 32/36 - S	4MB x 32/36 - S		36 MB
1MB x 32/36 - S	1MB x 32/36 - S	4MB x 32/36 - S	4MB x 32/36 - S	40 MB
2MB x 32/36 - D				8 MB
2MB x 32/36 - D	2MB x 32/36 - D			16 MB
2MB x 32/36 - D	2MB x 32/36 - D	2MB x 32/36 - D		24 MB
2MB x 32/36 - D	2MB x 32/36 - D	2MB x 32/36 - D	2MB x 32/36 - D	32 MB
4MB x 32/36 - S				16 MB
4MB x 32/36 - S	4MB x 32/36 - S			32 MB
4MB x 32/36 - S	4MB x 32/36 - S	4MB x 32/36 - S		48 MB
4MB x 32/36 - S	4MB x 32/36 - S	4MB x 32/36 - S	4MB x 32/36 - S	64 MB
256KB x 32/36 - S	1MB x 32/36 - S			5 MB
256KB x 32/36 - S	4MB x 32/36 - S			17 MB
256KB x 32/36 - S	16MB x 32/36 - S			65 MB
1MB x 32/36 - S	16MB x 32/36 - S			68 MB
1MB x 32/36 - S	1MB x 32/36 - S	16MB x 32/36 - S		72 MB
4MB x 32/36 - S	16MB x 32/36 - S			80 MB
4MB x 32/36 - S	4MB x 32/36 - S	16MB x 32/36 - S		96 MB
16MB x 32/36 - S				64 MB
16MB x 32/36 - S	16MB x 32/36 - S			128 MB
1MB x 32/36 - S	8MB x 32/36 - D			36 MB
1MB x 32/36 - S	8MB x 32/36 - D	8MB x 32/36 - D		68 MB

1MB x 32/36 - S	1MB x 32/36 - S	8MB x 32/36 - D		40 MB
1MB x 32/36 - S	1MB x 32/36 - S	8MB x 32/36 - D	8MB x 32/36 - D	72 MB
4MB x 32/36 - S	8MB x 32/36 - D			48 MB
4MB x 32/36 - S	8MB x 32/36 - D	8MB x 32/36 - D		80 MB
4MB x 32/36 - S	4MB x 32/36 - S	8MB x 32/36 - D		64 MB
4MB x 32/36 - S	4MB x 32/36 - S	8MB x 32/36 - D	8MB x 32/36 - D	96 MB
8MB x 32/36 - D				32 MB
8MB x 32/36 - D	8MB x 32/36 - D			64 MB
8MB x 32/36 - D	8MB x 32/36 - D	8MB x 32/36 - D		96 MB
8MB x 32/36 - D	8MB x 32/36 - D	8MB x 32/36 - D	8MB x 32/36 - D	128 MB

≺For GA-486VF≻

Bank 0	Bank 1	Total
256KB x 8 / 9 4pcs		1 MB
256KB x 8 / 9 4pcs	256KB x 8 / 9 4pcs	2 MB
1MB x 8 / 9 4pcs		4 MB
1MB x 8 / 9 4pcs	1MB x 8 / 9 4pcs	8 MB
1MB x 8 / 9 4pcs	4MB x 8 / 9 4pcs	20 MB
4MB x 8 / 9 4pcs		16 MB
4MB x 8 / 9 4pcs	4MB x 8 / 9 4pcs	32 MB
256KB x 8 / 9 4pcs	1MB x 8 / 9 4pcs	5 MB
256KB x 8 / 9 4pcs	4MB x 8 / 9 4pcs	17 MB
256KB x 8 / 9 4pcs	16MB x 8 / 9 4pcs	65 MB
1MB x 8 / 9 4pcs	16MB x 8 / 9 4pcs	68 MB
4MB x 8 / 9 4pcs	16MB x 8 / 9 4pcs	80 MB
16MB x 8 / 9 4pcs		64 MB
16MB x 8 / 9 4pcs	16MB x 8 / 9 4pcs	128 MB

The DRAM installation position refer to MAINBOARD LAYOUT, and notice the PIN-1 of SIMM module must match with the PIN-1 of SIMM socket when the DRAM SIMM module is installed.

Insert the DRAM SIMM module into the SIMM socket at 45 degree angle. If there is a wrong direction of PIN-1, the DRAM SIMM module couldn't be inserted into socket completely. After completely insert SIMM module into socket, then press the SIMM module in vertical direction until the left and right metal holders can keep the SIMM module standing up con-firmly.

3.5.SRAM INSTALLATION AND JUMPERS SETUP

The cache memory system consists of two parts, one is TAG SRAM, the other is DATA SRAM. The TAG SRAM type used in this mainboard is 8Kx8, 16Kx8 or 32Kx8-15 ns , and the DATA SRAM type is 8Kx8-15 ns, 32Kx8-15 ns 64Kx8-20ns or 128Kx8-20 ns.

The mainboard can be installed 64, 128, 256 or 512 KB cache memory when using 8Kx8 or 32Kx8 type DATA SRAM separately. Please refer to the following table to install cache memory system :

SRAM Size	Data SRAM	Tag SRAM	IC U. No.	JP1	JP2	JP3	JP4
64 KB	8 KB x 8	8 KB x 8	All (8 PCs.)	OFF	OFF	OFF	
128 KB	32 KB x 8	8 KB x 8	U1, U2, U3, U4	ON	OFF	OFF	1-2
256 KB	32 KB x 8	16 / 32 KB x 8	All (8 PCs.)	ON	ON	OFF	2-3
256 KB	64 KB x 8	16 / 32 KB x 8	U1, U2, U3, U4	ON	ON	OFF	1-2
512 KB	128 KB x 8	32 KB x 8	U1, U2, U3, U4	ON	ON	ON	1-2

3.6.CPU INSTALLATION AND JUMPERS SETUP

The system's speed depends on the frequency of CLOCK GENERATOR. The user can change the JUMPER (JP5 ~ JP7) selection to set up the system speed to 25 MHz, 33 MHz ,40 MHz and 50 MHz for different CPU speed.

The mainboard can use 80486DX, DX2, SX, OverDrive, P24T and DX4 CPU, and the CPU speed must match with the frequency of CLOCK GEN. It will cause system hanging up if the CLOCK GEN.'S frequency is higher than CPU's.

Refer to the following table to correctly install the CPU and jumpers setup:

CPU Type	Clock Gen.	CPU	JP5	JP6	JP7
486SX-25	25 MHz	25 MHz	OFF	OFF	ON
487SX-25	25 MHz	25 MHz	OFF	OFF	ON
486DX-25	25 MHz	25 MHz	OFF	OFF	ON
S-Series	25 MHz	25 MHz	OFF	OFF	ON
486DX2-50	25 MHz	50 MHz	OFF	OFF	ON
OverDrive	25 MHz	50 MHz	OFF	OFF	ON
DX4	25 MHz	75 MHz	OFF	OFF	ON
486SX-33	33.3 MHz	33.3 MHz	ON	ON	ON
487SX-33	33.3 MHz	33.3 MHz	ON	ON	ON
486DX-33	33.3 MHz	33.3 MHz	ON	ON	ON
S-Series	33.3 MHz	33.3 MHz	ON	ON	ON
486DX2-66	33.3 MHz	66.6 MHz	ON	ON	ON

OverDrive	33.3 MHz	66.6 MHz	ON	ON	ON
DX4	33.3 MHz	100 MHz	ON	ON	ON
486DX-40	40 MHz	40 MHz	OFF	ON	ON
486SX-40	40 MHz	40 MHz	OFF	ON	ON
486DX-50	50 MHz	50 MHz	ON	OFF	OFF
DX4	40 MHz	80 MHz	OFF	ON	ON

There is a jumper, JP11, to control the AMD CPU installed or not. Open JP11 if an AMD CPU is installed, otherwise Close this jumper.

JP36 and JP37 are used to select the 3.3 V or 5 V of CPU voltage. If the DX4 CPU is used, both jumpers are opened. Otherwise, both jumpers are closed.

The DX4 CPU has two types of internal CPU speed. One is double speed and the other is triple speed. If a double speed DX4 CPU is selected, close JP24 jumper. If a triple speed DX4 CPU is selected, open JP24 jumper.

- **The CPU is a sensitive electric component and it can be easily damaged by static electricity, so users must keep it away from metal surface when the CPU is installed onto mainboard.**
- **When the user installs the CPU on socket, please notice the PIN 1 of CPU is in the same corner as the PIN 1 of socket!**
- **Before the CPU is installed, the mainboard must be placed on a flat plane in order to avoid being broken by the pressure of CPU installation.**

3.7.EXT. POWER CONTROL PORT

When the system enter Power Down mode (timer is time-out), the JP33 pin 1 will change to low level from high level. When system is waked up (return to normal mode), the pin 1 will return to high level. The jumper is used to connect to the Green Function Power Supply for Monitor Power ON/OFF control.

3.8.CMOS BATTERY JUMPER SETUP

There're RTC & CMOS memories on board, so they need a power supply from battery to keep the data inviolate & effective. The RTC is a Real-Time Clock

device which provides the Date & Time to system. The CMOS memory is used for keeping the information of system configuration, so the system can automatically boot O. S. every time.

There is a re-chargeable battery on board, also there is an external battery connector on board. The user can close jumper JP16 pin 1-2 to use re-chargeable battery, or add an external battery to mainboard by connect it to J1.

The re-chargeable battery is automatically re-charged when the system is powered-on (JP16 pin 1-2 close), and provides the power when the system is powered-off. Before having a long distance transportation or not using system for a long time, closing the jumper JP16 pin 2-3 is recommended for saving power and extending the life of re-chargeable battery.

Due to the life-time of re-chargeable battery is 5-7 years, the user can use external battery to replace re-chargeable battery after it can not work. The 6V or 4.5V external battery is recommended to be used in system.

For some reasons (ex. lost password), the user can close the jumper JP16 pin 2-3 or disconnect the external battery connector to clear CMOS memory's data values. After this, the user must wait for a few minutes to let the remain power in CMOS discharge and then close the jumper JP16 pin 1-2 or connect external battery again to let it work normally.

3.9.SPEAKER CONNECTOR INSTALLATION

There is always a speaker in AT system for sound purpose. The 4-Pins connector J5 is used to connect speaker. The speaker can work well in both direction of connector when it is installed to the connector J8 on mainboard.

3.10.POWER LED & KEY LOCK CONNECTOR INSTALLATION

There are a system power LED lamp and a key on the panel of case. The power LED will light on when system is powered-on, and the key can lock the keyboard

input or unlock it, both of them are connected to a 5 PIN connector. The connector should be installed to J7 of mainboard in correct direction.

3.11.TURBO SWITCH CONNECTOR INSTALLATION

The TURBO switch on the panel is used for controlling the system speed. Some program developed on XT should be executed with a low speed system, so a high speed system needs the speed switching function to change its running speed.

Because a 80486 CPU cannot accept real clock speed change when program is executed, so the mainboard uses cache-enable or disable function to simulate TURBO switching function. The J3 on mainboard should be connected to the TURBO switch on panel, and user can push in or pop out the TURBO switch to enable or disable the cache function of system.

3.12.TURBO LED CONNECTOR INSTALLATION

The TURBO LED on panel can indicate the current speed status of system. The TURBO LED connector should be installed to J4 in correct direction.

3.13.HARDWARE RESET SWITCH CONNECTOR INSTALLATION

The Reset switch on panel provides users with Hardware Reset function which is almost the same as power on / off. The system will do a cold start after the Reset switch is pushed and released by user. The Reset switch is a 2 PIN connector and should be installed to J6 on mainboard.

3.14.GREEN FUNCTION INSTALLATION

For the purpose of power saving, there are two jumpers, JP34 and JP26, to make sure the power saving function doing well. The JP34 is a indicator (green

LED) for green function. If the green LED is ON, the system is operating in green mode. The JP26 is a switch to force the system get into green mode immediately.

3.15.PERIPHERAL DEVICE INSTALLATION

After the device installation and jumpers setup, the mainboard can be mounted into the case and fixed by screw. To complete the mainboard installation, the peripheral device could be installed now. The basic system needs a display interface card and a disk control interface card.

If the VL-Bus device is to be installed in the system, any one of three VL-Bus slots can be used no matter Slave or Master VL-Bus device being installed.

After installing the peripheral device, the user should check everything again, and prepare to power-on the system.

4.BIOS CONFIGURATION

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

4.1.ENTERING SETUP

Power ON the computer and press <Del> immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer, when the below message appears briefly at the bottom of the screen during the POST (PowerOnSelfTest), press<Del>key or simultaneously press<Ctrl>,<Alt>, and <Esc> keys.

- TO ENTER SETUP BEFORE BOOT PRESS CTRL-ALT-ESC OR DEL KEY

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" bottom on the system case. You may also restart by simultaneously press <Ctrl>,<Alt>,and<Del> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to,

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

4.2.CONTROL KEYS

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu - Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu - Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes

PgDn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Change color from total 16 colors
F3 key	Calendar, only for Status Page Setup Menu
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.3.GETTING HELP

4.3.1.Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

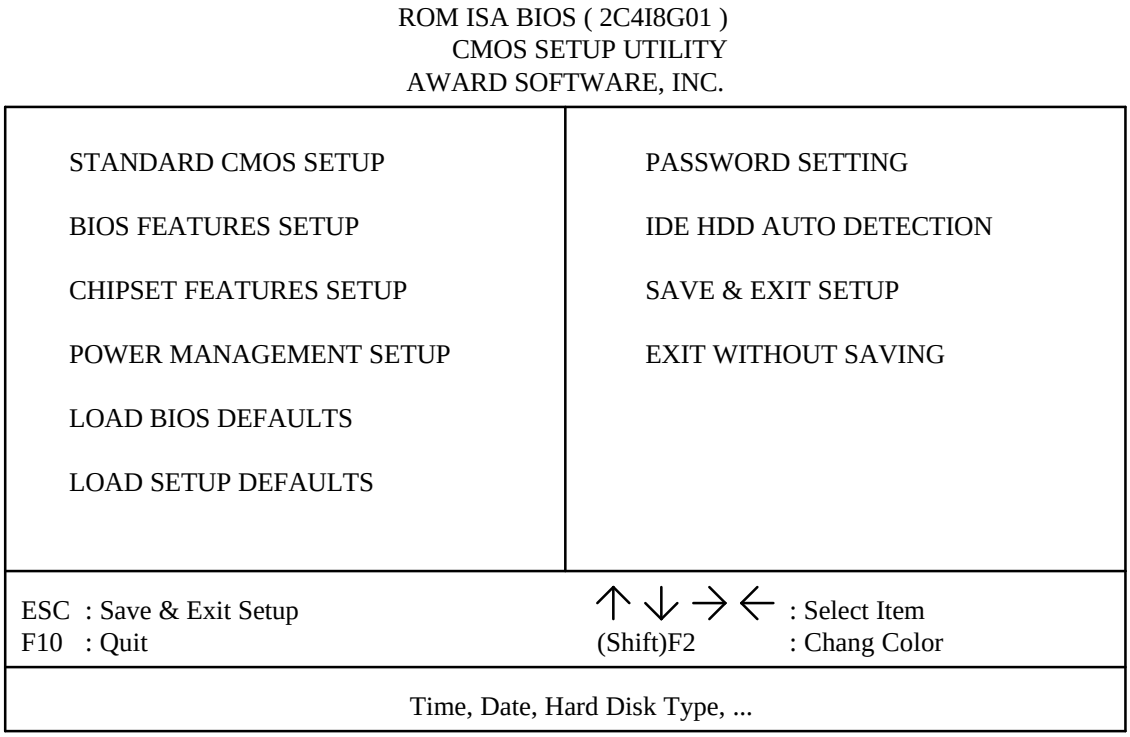
4.3.2.Status Page Setup Menu / Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc>.

4.4.THE MAIN MENU

Once you enter Award BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from seven setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

Figure 1: Main Menu



- Standard CMOS setup

  This setup page includes all the items in a standard compatible BIOS.

- BIOS features setup

  This setup page includes all the items of Award special enhanced features.

- Chipset features setup

  This setup page includes all the items of chipset special features.

- Power Management Setup

  This setup page includes all the item of power management features.

- Load BIOS Defaults

  BIOS defaults indicates the most appropriate value of the system parameter which the system would be on more safety operation.

- Load SETUP Defaults

  SETUP defaults indicates the most appropriate value of the system parameter which the system would be in maximum performance.

- Password setting

  Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.

- IDE HDD auto detection

  Automatically configure hard disk parameter.

- Save & exit setup

  Save CMOS value changes to CMOS and exit setup.

- Exit without save

  Abandon all CMOS value changes and exit setup.

4.5.STANDARD CMOS SETUP MENU

The items in Standard CMOS Setup Menu (Figure 2) are divided into 9 categories. Each category includes no, one or more than one setup items. Use the arrows to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

Figure 2: Standard CMOS Setup Menu

ROM ISA BIOS (2C4I8G01)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Tri, Jan 28 1994
Time (hh:mm:ss) : 11 : 27 : 49

	CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS
Drive C : 1 (10Mb)	306	4	128	305	17
Drive D : None (0 Mb)	0	0	0	0	0

Drive A : 1.44 M 3.5 in.
Drive B : 1.2 M, 5.25 in.

Video : EGA/VGA

Halt On : All Errors

Base Memory: 640 K
Extended Memory: 7168 K
Expanded Memory: 0 K
Other Memory: 384 K
Total Memory: 8192 K

ESC: Quit ↑ ↓ → ←: Select Item PU/PD/+/- : Modify
F1 : Help (Shift)F2 : Chang Color F3 : Taggle Calender

- Date

The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	The day, from Sun to Sat, determined by the BIOS and is display-only
date	The date, from 1 to 31 (or the maximum allowed in the month)
month	The month, Jan. through Dec.
year	The year, from 1900 through 2099

- Time

The time format in <hour> <minute> <second>. The time is calculated base on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- Drive C type / Drive D type

The category identify the types of hard disk drive C or drive D that has been installed in the computer. There are 46 pre-defined types and a user definable type. Type 1 to Type 46 are pre-defined. Type User is user-definable.

Press PgUp or PgDn to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press <Enter>. Those information should be provided in the documentation form your hard disk vendor or the system manufacturer.

CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precom
LANDZONE	landing zone
SECTORS	number of sectors

If a hard disk has not been installed select NONE and press <Enter>.

- Drive A type / Drive B type

The category identify the types of floppy disk drive A or drive B that has been installed in the computer.

None	No floppy drive installed
360K, 5.25 in.	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in.	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in.	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in.	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in.	3-1/2 inch double-sided drive; 2.88 megabyte capacity

- Video

The category detects the type of adapter used for the primary system monitor that must matches your video display card and monitor. Although secondary monitors are supported, you do not have to select the type in setup.

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

- Halt on

The category determines whether the computer will stop if an error is detected during power up.

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

- Memory

The category is display-only which is determined by POST (Power On Self Test) of the BIOS.

Base Memory

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512 K for systems with 512 K memory installed on the motherboard, or 640 K for systems with 640 K or more memory installed on the motherboard.

Extended Memory

The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1 MB in the CPU's memory address map.

Expanded Memory

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

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

Other Memory

This refers to the memory located in the 640K to 1024K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers to keep as much base memory free for application programs. Most use for this area is Shadow RAM.

4.6.BIOS FEATURES SETUP

ROM ISA BIOS (2C4I8G01)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Security Option	: Setup	Video BIOS Shadow	: Enabled
Virus Warning	: Disabled	C8000 - CFFFF Shadow	: Disabled
CPU Internal Cache	: Enabled	D0000 - D7FFF Shadow	: Disabled
External Cache	: Enabled	D8000 - DFFFF Shadow	: Disabled
Quick Power On Self Test	: Enabled		
Boot Sequence	: A, C		
Swap Floppy Drive	: Disabled		
Boot Up Floppy Seek	: Enabled		
Boot Up NumLock Status	: On		
IDE HDD Block Mode	: Disabled		
Turbo SW Function Enable	:Yes		

ESC: Quit		↑ ↓ → ←	: Select Item
F1 : Help		PU/PD/+/-	: Modify
F5 : Old Values		(Shift)F2	: Color
F6 : Load BIOS Defaults			
F7 : Load Setup Defaults			

- Security Option

Setup	Asking password when enter CMOS Setup.
System	Asking password when enter CMOS Setup and boot system.

- Virus Warning

This category flashes on the screen. During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and the following error message will appear, in the mean time, you can run anti-virus program to locate the problem. Default value is Disabled.

Enabled	Activate automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table
Disabled	No warning message to appear when anything attempts to access the boot sector or hard disk partition table

- CPU Internal Cache / External Cache

These two categories speed up memory access. However, it depends on CPU / chipset design. The default value is Enabled.

Enabled	Enable cache
Disabled	Disable cache

- Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST. The default value is Enabled.

Enabled	Enable quick POST
Disabled	Normal POST

- Boot Sequence

This category determines which drive computer searches first for the disk operating system (i.e., DOS). Default value is A,C.

A,C	System will first search for floppy disk drive then hard disk drive
C,A	System will first search for hard disk drive then floppy disk drive

- Swap Floppy Drive

The default value is Disabled.

Enabled	Floppy A & B will be swapped under DOS
Disabled	Floppy A & B will be normal definition

- Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 720K, 1.2M and 1.44M are all 80 tracks. The default value is Enabled.

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks, Note that

	BIOS can not tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K

- Boot Up NumLock Status
  The default value is On

On	Keypad is number keys
Off	Keypad is arrow keys

- IDE HDD Block Mode
  The default value is Disabled.

Enabled	Enable IDE HDD Block Mode
Disabled	Disable IDE HDD Block Mode

- Turbo SW Function Enable
  The default value is Yes

Yes	Change system speed by Turbo SW immediately when system boot up.
No	Change system speed by keyboard immediately when system boot up.

✶ This option is valid from BIOS DATE CODE Apr. 16, 1994 or later.

- Video BIOS Shadow
  It determines whether video BIOS will be copied to RAM, however, it is optional from chipset design. Video Shadow will increase the video speed. The default value is Enabled.

Enabled	Video shadow is enabled
Disabled	Video shadow is disabled

- C8000 - CFFFF Shadow / D0000 - DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte. The default value are Disabled.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

4.7.CHIPSET FEATURES SETUP

ROM ISA BIOS (2C4I8G01)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	
AT Bus Clock	: 1/5 CLKIN	
DRAM Speed	: Faster	
Cache Burst Read	: 1W	
Cache Write Cycle	: 1W	
Latch Local Bus	: T3	
Slow Refresh	: Disabled	
Hidden Refresh	: Enabled	
External Cache WB/WT	: Write Back	
Internal Cache WB/WT	: Write Thru	
System Shadow	: Cacheable	
Video Shadow	: Cacheable	
Memory Hole Size	: None	
256KB Remap Function	: Enable	
		ESC: Quit ↑ ↓ → ← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults

- Auto Configuration
  The default value is Enabled.

Enabled	For Enable auto configuration function.
Disabled	For Disable auto configuration function.

- AT Bus Clock

1/3 CLKIN	For 25 MHz system.
1/4 CLKIN	For 33 MHz system.
1/5 CLKIN	For 40 MHz system.
1/6 CLKIN	For 50 MHz system.

- DRAM Speed

Faster	For 40 MHz or 50 MHz system.
Fastest	For 25 MHz or 33 MHz system.

- Cache Burst Read

0W	For 25 MHz or 33 MHz system.
1W	For 40 MHz, 50 MHz or one bank cache installed system.

- Cache Write Cycle

0W	For 25 MHz or 33 MHz system.
1W	For 40 MHz, 50 MHz or one bank cache installed system.

- Latch Local Bus

T2	For 25 MHz or 33 MHz system.
T3	For 40 MHz or 50 MHz system.

- Slow Refresh

  The default value is Disabled.

Enabled	Enable Slow Refresh function.
Disabled	Disable Slow Refresh function.

- Hidden Refresh
  The default value is Enabled.

Enabled	Enable Hidden Refresh function.
Disabled	Disable Hidden Refresh function.

- External Cache WB / WT
  The default value is Write Back.

Write Thru	Using write through for the configuration of external cache.
Write Back	Using write back for the configuration of external cache.

- Internal Cache WB / WT
  The default value is Write Through.

Write Thru	Using write through for the configuration of CPU internal cache.
Write Back	Using write back for the configuration of CPU internal cache.

- System Shadow

  The default value is Cacheable.

Cacheable	Cache and Shadow system BIOS.
Non-cacheable	Shadow system BIOS only.

- Video Shadow

  The default value is Cacheable.

Cacheable	Cache and Shadow video BIOS.
Non-cacheable	Shadow video BIOS only.

- Memory Hole Size

None	System doesn't assign any memory below 16 MB to AT Bus.
1 MB	System assign 1 MB memory size below 16 MB to AT Bus.
2 MB	System assign 2 MB memory size below 16 MB to AT Bus.
4 MB	System assign 4 MB memory size below 16 MB to AT Bus.

- 256KB Remap Function
  The default value is Enabled.

Enable	When DRAM size is 1, 2, 4, 5, 6 or 8MB, the extend memory will increase 256KB if the memory block D0000~EFFFF is not occupied by shadow function or SMM mode.
Disable	Disable 256KB Memory Remap function.

✶ This options is valued from BIOS Date Code 03/25/94.

4.8.POWER MANAGEMENT SETUP

ROM ISA BIOS (2C4I8G01)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Green Function	: Enable	PM Control by APM	: No
Green Timer	: 3 Min	VGA Adaptor Type	: Non-Green
HDD Power Down	: Disable	O.S.	: ALL O.S.
Monitor Local Device	: Enable		
Monitor Video Action	: Enable		
Monitor IRQ5	: Disable		
Monitor IRQ7	: Disable		
Monitor IRQ9	: Disable		
Monitor IRQ10	: Disable		
Monitor IRQ12	: Disable		

ESC: Quit		↑ ↓ → ←	: Select Item
F1	: Help	PU/PD/+/-	: Modify
F5	: Old Values	(Shift)F2	: Color
F6	: Load BIOS Defaults		
F7	: Load Setup Defaults		

- Green Function

Enable	Enable Green function.
Disable	Disable Green function.

- Green Timer

Disable	Disable System's Green Timer function.
10 secs - 3 hours	Enable System's Green Timer function between 10 seconds to 3 hours.

- HDD Power Down

Disable	Disable HDD Power Down mode function.
1 - 15 Mins	Enable HDD enter Power Down mode between 1 to 15 mins.
When Suspend	The HARD DISK will be forced to Power Down when system get into Green Mode. (This function is valid from BIOS DATE CODE Apr. 16, 1994 or later.)

✶ If your system have any problem using some of the HARD DISKS when enable HDD Power Down function, please disable this function.

- Monitor Local Device, Video Action, IRQ5 ~ IRQ12

The system get into green mode or not depending on the status of Local Device, Video Action or IRQ5 ~ IRQ12.

Enable	System will not get into green mode when Local Device, Video Action or IRQ5 ~ IRQ12 is activity.
Disable	System will get into green mode no matter what Local Device, Video Action or IRQ5 ~ IRQ12 is activity or not.

- PMControlbyAPM

This category can be accessed while S-Series CPU installed.

Yes	BIOS will combine DOS 6.2 (power.exe) & Windows 3.1 (DOS with APM) to get into Green mode.
No	BIOS will not combine DOS 6.2 (power.exe) & Windows 3.1 (DOS with APM) to get into Green mode.

- VGAAdaptorType

This category can be accessed while S-Series CPU installed.

Green	BIOS will turn off H-SYNC & V-SYNC when get into Green mode for Green monitor power saving.
Non-Green	BIOS will only black monitor when get into Green mode.

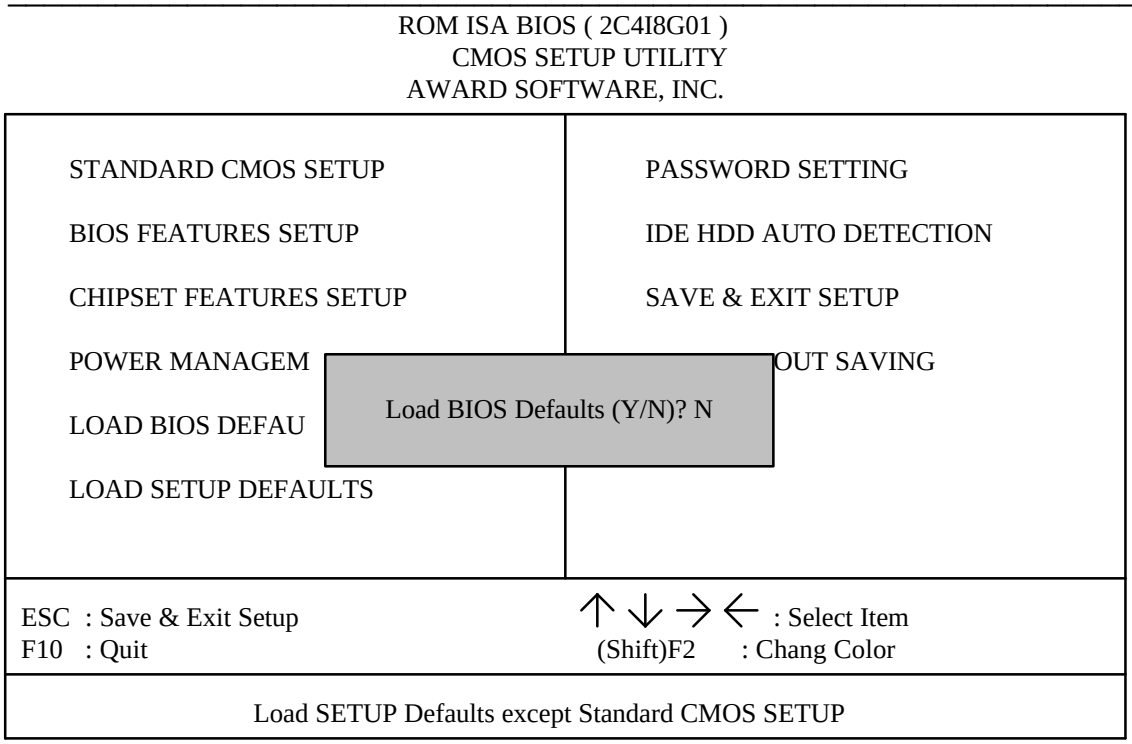
- O.S.

Support Intel Non-S & AMD & CYRIX CPU to close monitor in DOS system.

ALL O.S.	don't close monitor in all O.S.
DOS ONLY15	use IRQ15 to close monitor in DOS system only.
DOS ONLY12	use IRQ12 to close monitor in DOS system only.

✶ Don't select DOS ONLY15 or ONLY12 if your O.S. is Non-DOS system. (For example OS/2, Unix or Novell)

4.9.LOAD BIOS DEFAULTS

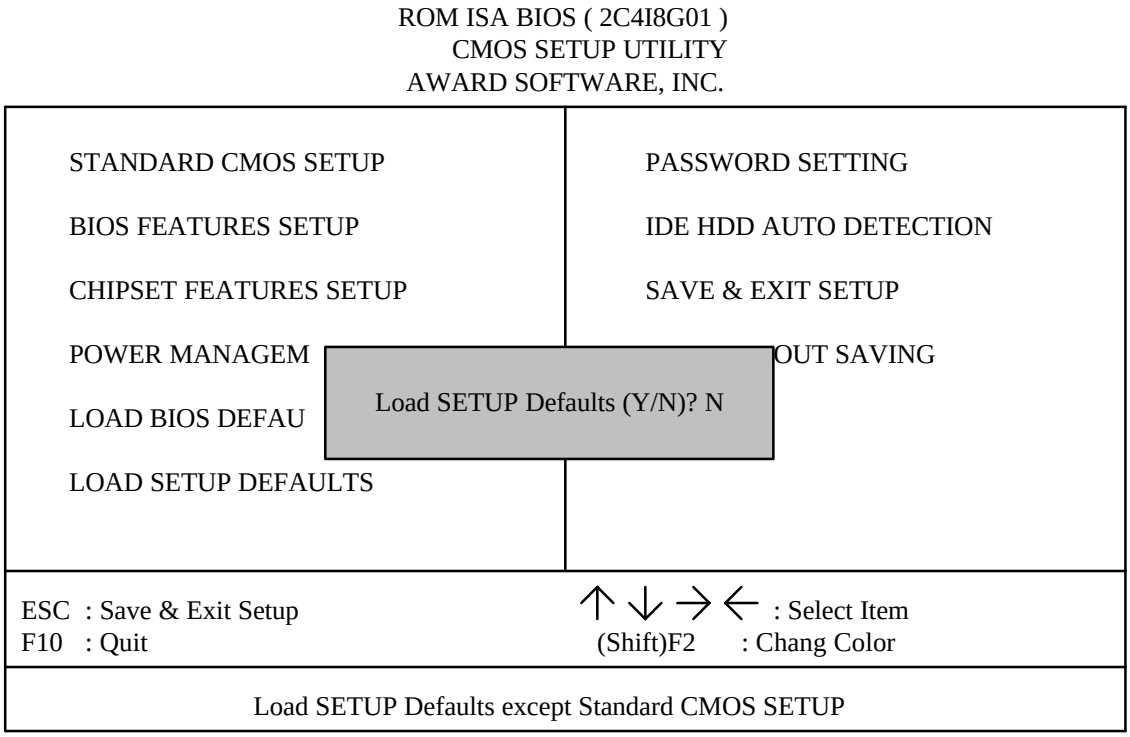


- Load BIOS Defaults

  To load BIOS defaults value to CMOS SRAM, enter "Y". If not, enter "N".

If there is any problem occurred, loading BIOS DEFAULTS step is recommended.

4.10.LOAD SETUP DEFAULTS



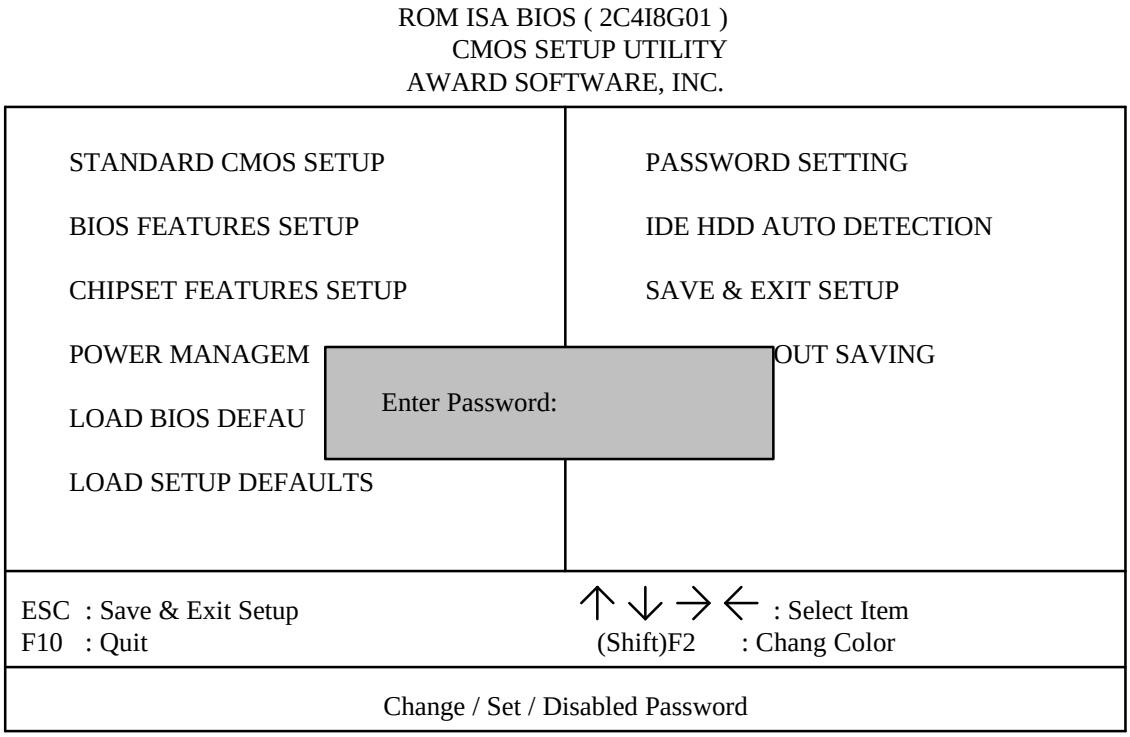
- Load Setup Defaults

  To load Setup defaults value to CMOS SRAM, enter "Y". If not, enter "N".

4.11.PASSWORD SETTING

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD



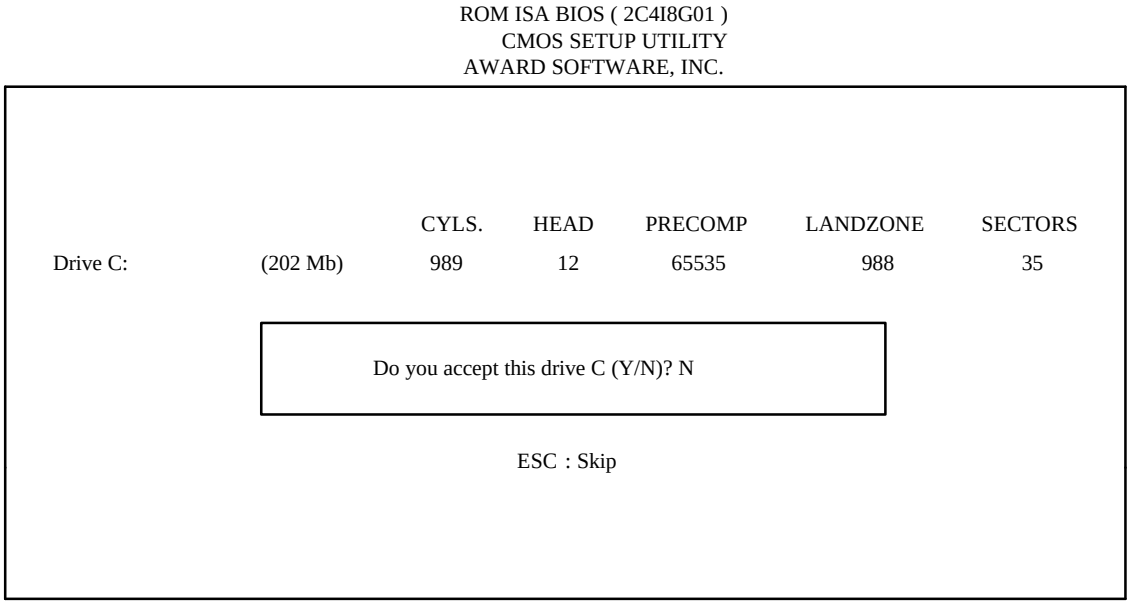
Type the password, up to eight characters, and press <Enter>. The password typed now will clear and previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable password, just press <Enter> when you are prompted to enter password. A message will confirm the password being disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

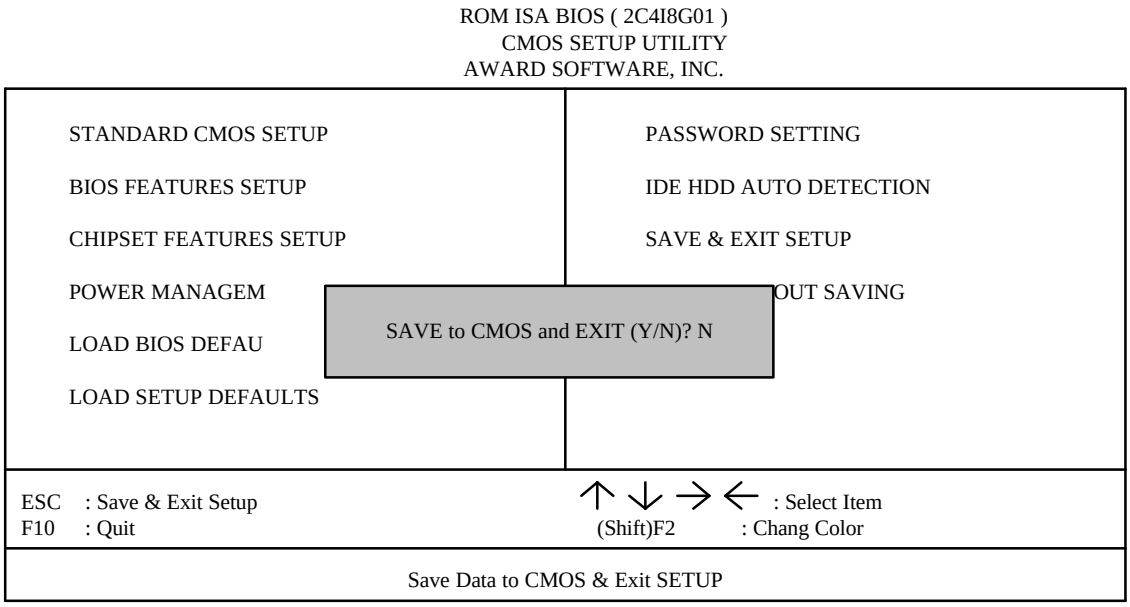
If you select System at Security Option of BIOS Features Setup Menu, you will be prompted for the password every time the system is rebooted or any time you try to enter Setup. If you select Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

4.12.IDE HDD AUTO DETECTION



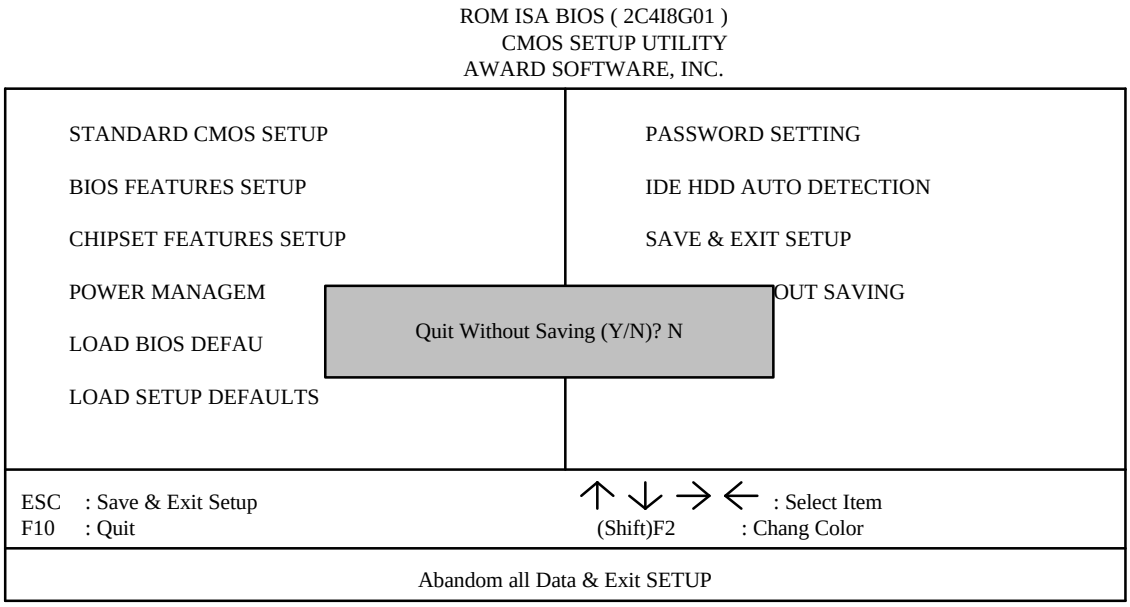
Type "Y" will accept the H.D.D. parameter reported by BIOS. Type "N" will keep the old H.D.D. parameter setup.

4.13.SAVE & EXIT SETUP



Type "Y" will quit the Setup Utility and save the user setup value to RTC CMOS SRAM. Type "N" will return to Setup Utility.

4.14.EXIT WITHOUT SAVING



Type "Y" will quit the Setup Utility without saving to RTC CMOS SRAM. Type "N" will return to Setup Utility.

4.15.KEYBOARD SETTING FUNCTION

After booting the O.S., there are some special functions used by keyboard as follows:

"CTRL_ALT_DEL"	Pressing these keys simultaneously will cause system to WARM START (Soft Reset).
"CTRL_ALT_[+]"	Pressing these keys simultaneously will change the system speed to high speed (TURBO, all cache memory enable).
"CTRL_ALT_[-]"	Pressing these keys simultaneously will change the system speed to low speed (Normal, disable cache memory).

5.AT TECHNICAL INFORMATION

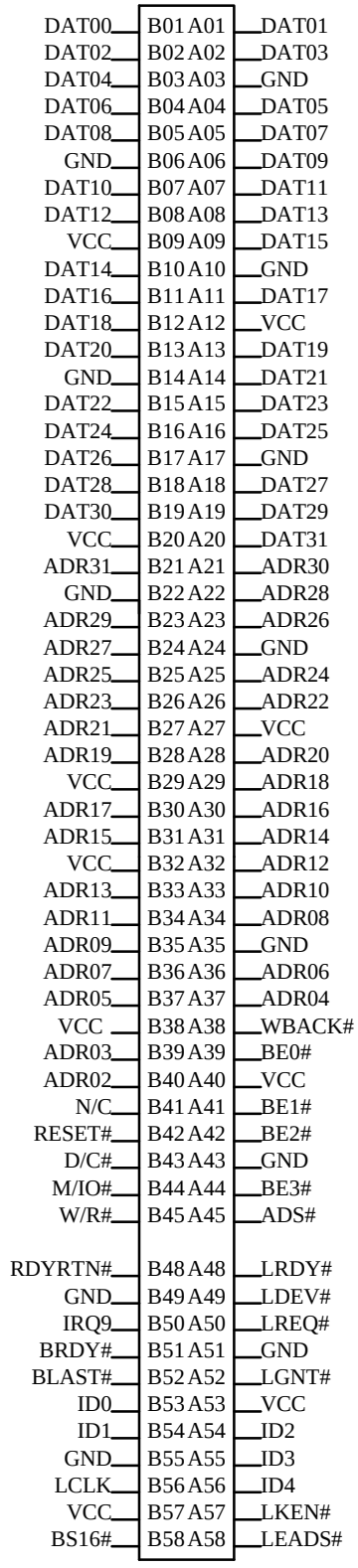
5.1.I/O BUS CONNECTOR PIN OUT

5.1.1.ISA BUS SLOT PIN OUT

GND	B01	A01	-I/O CH CHK
RESET	B02	A02	SD07
+5V	B03	A03	SD06
IRQ9	B04	A04	SD05
-5V	B05	A05	SD04
DRQ2	B06	A06	SD03
-12V	B07	A07	SD02
0WS	B08	A08	SD01
+12V	B09	A09	SD00
GND	B10	A10	-I/O CH RDY
-SMEMW	B11	A11	AEN
-SMEMR	B12	A12	SA19
-IOW	B13	A13	SA18
-IOR	B14	A14	SA17
-DACK3	B15	A15	SA16
-DRQ3	B16	A16	SA15
-DACK1	B17	A17	SA14
-DRQ1	B18	A18	SA13
-REFRESH	B19	A19	SA12
BCLK	B20	A20	SA11
IRQ7	B21	A21	SA10
IRQ6	B22	A22	SA09
IRQ5	B23	A23	SA08
IRQ4	B24	A24	SA07
IRQ3	B25	A25	SA06
-DACK2	B26	A26	SA05
T/C	B27	A27	SA04
BALE	B28	A28	SA03
+5V	B29	A29	SA02
OSC	B30	A30	SA01
GND	B31	A31	SA00

-MEMCS16	D01	C01	SBHE
-I/OCS16	D02	C02	LA23
IRQ10	D03	C03	LA22
IRQ11	D04	C04	LA21
IRQ12	D05	C05	LA20
IRQ15	D06	C06	LA19
IRQ14	D07	C07	LA18
-DACK0	D08	C08	LA17
DRQ0	D09	C09	-MEMR
-DACK5	D10	C10	-MEMW
DRQ5	D11	C11	SD08
-DACK6	D12	C12	SD09
DRQ6	D13	C13	SD10
-DACK7	D14	C14	SD11
DRQ7	D15	C15	SD12
+5V	D16	C16	SD13
-MASTER	D17	C17	SD14
GND	D18	C18	SD15

5.1.2.VL-BUS SLOT PIN OUT



DAT00	B01 A01	DAT01
DAT02	B02 A02	DAT03
DAT04	B03 A03	GND
DAT06	B04 A04	DAT05
DAT08	B05 A05	DAT07
GND	B06 A06	DAT09
DAT10	B07 A07	DAT11
DAT12	B08 A08	DAT13
VCC	B09 A09	DAT15
DAT14	B10 A10	GND
DAT16	B11 A11	DAT17
DAT18	B12 A12	VCC
DAT20	B13 A13	DAT19
GND	B14 A14	DAT21
DAT22	B15 A15	DAT23
DAT24	B16 A16	DAT25
DAT26	B17 A17	GND
DAT28	B18 A18	DAT27
DAT30	B19 A19	DAT29
VCC	B20 A20	DAT31
ADR31	B21 A21	ADR30
GND	B22 A22	ADR28
ADR29	B23 A23	ADR26
ADR27	B24 A24	GND
ADR25	B25 A25	ADR24
ADR23	B26 A26	ADR22
ADR21	B27 A27	VCC
ADR19	B28 A28	ADR20
VCC	B29 A29	ADR18
ADR17	B30 A30	ADR16
ADR15	B31 A31	ADR14
VCC	B32 A32	ADR12
ADR13	B33 A33	ADR10
ADR11	B34 A34	ADR08
ADR09	B35 A35	GND
ADR07	B36 A36	ADR06
ADR05	B37 A37	ADR04
VCC	B38 A38	WBACK#
ADR03	B39 A39	BE0#
ADR02	B40 A40	VCC
N/C	B41 A41	BE1#
RESET#	B42 A42	BE2#
D/C#	B43 A43	GND
M/IO#	B44 A44	BE3#
W/R#	B45 A45	ADS#
RDYRTN#	B48 A48	LRDY#
GND	B49 A49	LDEV#
IRQ9	B50 A50	LREQ#
BRDY#	B51 A51	GND
BLAST#	B52 A52	LGNT#
ID0	B53 A53	VCC
ID1	B54 A54	ID2
GND	B55 A55	ID3
LCLK	B56 A56	ID4
VCC	B57 A57	LKEN#
BS16#	B58 A58	LEADS#

5.2.I/O & MEMORY MAP

MEMORY MAP:	[0000000-009FFFF]	System memory used by DOS and application program.
	[00A0000-00BFFFF]	Display buffer memory for VGA/ EGA/CGA/MONOCHROME adapter.
	[00C0000-00DFFFF]	Reserved for I/O device BIOS ROM or RAM buffer.
	[00E0000-00EFFFF]	Reserved for PCI device ROM.
	[00F0000-00FFFFF]	System BIOS ROM.
	[0100000-BFFFFFF]	System extension memory.

I/O MAP:	[000-01F]	DMA controller.(Master)
	[020-021]	INTERRUPT controller.(Master)
	[022-023]	CHIPSET control registers I/O ports.
	[040-05F]	TIMER control registers.
	[060-06F]	KEYBOARD interface controller.(8042)
	[070-07F]	RTC ports & CMOS I/O ports.
	[080-09F]	DMA register.
	[0A0-0BF]	INTERRUPT controller.(Slave)
	[0C0-0DF]	DMA controller.(Slave)
	[0F0-0FF]	MATH COPROCESSOR
	[1F0-1F8]	HARD DISK controller.
	[278-27F]	PARALLEL port-2.
	[2B0-2DF]	GRAPHICS adapter controller.
	[2F8-2FF]	SERIAL port-2.
	[360-36F]	NETWORK ports.
	[378-37F]	PARALLEL port-1
	[3B0-3BF]	MONOCHROME & PRINTER adapter.
	[3C0-3CF]	EGA adapter.
	[3D0-3DF]	CGA adapter.
	[3F0-3F7]	FLOPPY DISK controller.
	[3F8-3FF]	SERIAL port-1.

5.3.TIMER & DMA CHANNELS MAP

TIMER MAP:	TIMER Channel-0 System timer interrupt
	TIMER Channel-1 DRAM REFRESH request
	TIMER Channel-2 SPEAKER tone generator

DMA CHANNELS:	DMA Channel-0 Available
	DMA Channel-1 IBM SDLC
	DMA Channel-2 FLOPPY DISK adapter
	DMA Channel-3 Available
	DMA Channel-4 Cascade for DMA controller 1
	DMA Channel-5 Available
	DMA Channel-6 Available
	DMA Channel-7 Available

5.4.INTERRUPT MAP

NMI: Parity check error

IRQ (H/W):
0 System TIMER interrupt from TIMER-0
1 KEYBOARD output buffer full
2 Cascade for IRQ 8-15
3 SERIAL port 2
4 SERIAL port 1
5 PARALLEL port 2
6 FLOPPY DISK adapter
7 PARALLEL port 1
8 RTC clock
9 Available
10 Available
11 Available
12 Available
13 MATH coprocessor
14 HARD DISK adapter
15 Available

5.5.RTC & CMOS RAM MAP

RTC & CMOS:	00	Seconds
	01	Second alarm
	02	Minutes
	03	Minutes alarm
	04	Hours
	05	Hours alarm
	06	Day of week
	07	Day of month
	08	Month
	09	Year
	0A	Status register A
	0B	Status register B
	0C	Status register C
	0D	Status register D
	0E	Diagnostic status byte
	0F	Shutdown byte
	10	FLOPPY DISK drive type byte
	11	Reserve
	12	HARD DISK type byte
	13	Reserve
	14	Equipment byte
	15	Base memory low byte
	16	Base memory high byte
	17	Extension memory low byte
	18	Extension memory high byte
	19-2d	
	2E-2F	
	30	Reserved for extension memory low byte
	31	Reserved for extension memory high byte
	32	DATE CENTURY byte
	33	INFORMATION FLAG
	34-3F	Reserve
	40-7f	Reserved for CHIPSET SETTING DATA

APPENDIX A: POST MESSAGE

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

- POST BEEP

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

- ERROR MESSAGE

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

⌦ CMOS BATTERY HAS FAILED

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

⌦ CMOS CHECKSUM ERROR

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

⌦ DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

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

⌦ DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to re-configure the drive type correctly.

⌦ DISPLAY SWITCH IS SET INCORRECTLY

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

⌦ DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

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

⌦ ERROR ENCOUNTERED INITIALIZING HARD DRIVE

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

⌦ ERROR INITIALIZING HARD DISK CONTROLLER

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly in the hard drive.

⌦ FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

⌦ KEYBOARD ERROR OR NO KEYBOARD PRESENT

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

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

⌦ Memory Address Error at ...

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

⌦ MEMORY SIZE HAS CHANGED SINCE LAST BOOT

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

⌦ Memory Verify Error at ...

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

⌦ OFFENDING ADDRESS NOT FOUND

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

⌦ OFFENDING SEGMENT:

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

⌦ PRESS A KEY TO REBOOT

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

⌦ PRESS F1 TO DISABLE NMI, F2 TO REBOOT

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

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

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

APPENDIX B: POST CODES

☞ ISA POST codes are typically output to port address 80h.

POST	Name	Description
C0	Turn Off Chipset Cache	OEM Specific-Cache control.
1	Processor Test 1	Processor Status (1 FLAGS) Verification. Test the following processor status flags carry, zero, sign, overflow, The BIOS will set each of these flags, verify they are set, then turn each flag off and verify it is off.
2	Processor Test 2	Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00.
3	Initialize Chips	Disable NMI, PIE, AIE, UEI, SQWV. Disable video, parity checking, DMA. Reset math coprocessor. Clear all page registers, CMOS shutdown byte. Initialize timer 0, 1, and 2, including set EISA timer to a known state. Initialize DMA controllers 0 and 1. Initialize interrupt controllers 0 and 1. Initialize EISA extended registers.
4	Test Memory Refresh Toggle	RAM must be periodically refreshed in order to keep the memory from decaying. This function assures that the memory refresh function is working properly.
5	Blank video, Initialize keyboard	Keyboard controller initialization.
6	Reserved	
7	Test CMOS Interface and Battery Status	Verifies CMOS is working correctly, detects bad battery.
BE	Chipset Default Initialization	Program chipset registers with power on BIOS defaults.
C1	Memory presence test	OEM Specific-Test to size on-board memory.
C5	Early Shadow	OEM Specific-Early Shadow enable for fast boot.
C6	Cache presence test	External cache size detection.
8	Setup low memory	Early chip set initialization. Memory presence test. OEM chip set routines. Clear low 64 K of memory. Test first 64 K memory.
9	Early Cache Initialization	Cyrix CPU initialization. Cache initialization.
A	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT-HDLR and initialize INT 00h-1Fh according to INT_TBL.
B	Test CMOS RAM Checksum	Test CMOS RAM Checksum, if bad, or insert key pressed, load defaults.
C	Initialize keyboard	Detect type of keyboard controller (optional). Set NUM_LOCK status.
D	Initialize Video Interface	Detect CPU clock. Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
E	Test Video Memory	Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
F	Test DMA Controller 0	BIOS checksum test.

		Keyboard detect and initialization.
10	Test DMA Controller 1	
11	Test DMA Page registers	Test DMA Page Registers.
12-13	Reserved	
14	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
15	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
16	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.
17	Test Stuck 8259's Interrupt Bits	Turn off interrupts then verify no interrupt mask register is on.
18	Test 8259 Interrupt Functionality	Force an interrupt and verify the interrupt occurred.
19	Test Stuck NMI Bits (Parity/IO Check)	Verify NMI can be cleared.
1A		Display CPU clock.
1B-1E	Reserved	
20	Enable Slot 0	Initialize slot 0 (System Board).
21-2F	Enable Slots 1-15	Initialize slot 1 through 15.
30	Size Base and Extended Memory	Size base memory from 256 K to 640 K extended memory above 1 MB.
31	Test Base and Extended Memory	Test base memory from 256 K to 640 K and extended memory above 1 MB using various patterns. ☞ This will be skipped in EISA mode and can be "skipped" with ESC key in ISA mode.
33-3B	Reserved	
3C	Setup Enabled	
3D	Initialize & Install Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
3E	Setup Cache Controller	Initialize cache controller.
3F	Reserved	
BF	Chipset Initialization	Program chipset registers with Setup values.
40		Display virus protest disable or enable.
41	Initialize Floppy Drive & Controller	Initialize floppy disk drive controller and any drives.
42	Initialize Hard Drive & Controller	Initialize hard drive controller and any drives.
43	Detect & Initialize Serial/Parallel Ports	Initialize any serial and parallel ports (also game port).
44	Reserved	
45	Detect & Initialize Math Coprocessor	Initialize math coprocessor.
46	Reserved	
47	Reserved	
48-4D	Reserved	
4E	Manufacturing POST Loop or Display Messages	Reboot if Manufacturing POST Loop pin is set. Otherwise display any messages (i.e., any non-fatal errors that were detected during POST) and enter Setup.
4F	Security Check	Ask password security (optional).
50	Write CMOS	Write all CMOS values back to RAM and clear screen.
51	Pre-boot Enable	Enable parity checker. Enable NMI, Enable cache before boot.
52	Initialize Option ROMs	Initialize any option ROMs present from C8000h to EFFFFh. ☞ When FSCAN option is enabled, will initialize from C8000h to F7FFFh.
53	Initialize Time Value	Initialize time value in 40h: BIOS area.
60	Setup Virus Protect	Setup virus protect according to Setup

61	Set Boot Speed	Set system speed for boot
62	Setup NumLock	Setup NumLock status according to Setup
63	Boot Attempt	Set low stack. Boot via INT 19h.
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display Press F1 to disable NMI, F2 reboot.
E1-EF	Setup Pages	E1 - Page 1, E2 - Page 2, etc.
FF	Boot	

APPENDIX C: BIOS DEFAULT DRIVE TABLE

Type	Size (MB)	Cylinders	Heads	Sectors	Write / Precomp	Land Zone	Example Model
1	10 MB	306	4	17	128	305	TEAC SD510 MMI 112, 5412
2	20 MB	615	4	17	300	615	Seagate ST225, ST4026
3	31 MB	615	6	17	300	615	
4	62 MB	940	8	17	512	940	
5	47 MB	940	6	17	512	940	
6	20 MB	615	4	17	65535	615	Seagate ST125 Tandon TM262
7	31 MB	462	8	17	256	511	
8	30 MB	733	5	17	65535	733	Tandon TM703
9	112 MB	900	15	17	65535	901	
10	20 MB	820	3	17	65535	820	
11	35 MB	855	5	17	65535	855	
12	50 MB	855	7	17	65535	855	
13	20 MB	306	8	17	128	319	Disctron526, MMI M125
14	43 MB	733	7	17	65535	733	
16	20 MB	612	4	17	0	663	Microscience HH725 Syquest3250, 3425
17	41 MB	977	5	17	300	977	
18	57 MB	977	7	17	65535	977	
19	60 MB	1024	7	17	512	1023	
20	30 MB	733	5	17	300	732	
21	43 MB	733	7	17	300	732	
22	30 MB	733	5	17	300	733	Seagate ST4038
23	10 MB	306	4	17	0	336	
24	54 MB	925	7	17	0	925	Seagate ST4051
25	69 MB	925	9	17	65535	925	Seagate ST4096
26	44 MB	754	7	17	754	754	Maxtor2085
27	69 MB	754	11	17	65535	754	Maxtor2140, Priam S14
28	41 MB	699	7	17	256	699	Maxtor2190, Priam S19
29	68 MB	823	10	17	65535	823	Maxtor1085 Micropolis1325
30	53 MB	918	7	17	918	918	Maxtor1105, 1120, 4780
31	94 MB	1024	11	17	65535	1024	Maxtor1170
32	128 MB	1024	15	17	65535	1024	CDC9415
33	43 MB	1024	5	17	1024	1024	
34	10 MB	612	2	17	128	612	
35	77 MB	1024	9	17	65535	1024	
36	68 MB	1024	8	17	512	1024	
37	41 MB	615	8	17	128	615	
38	25 MB	987	3	17	987	987	
39	57 MB	987	7	17	987	987	Maxtor1140, 4380
40	41 MB	820	6	17	820	820	Seagate ST251
41	41 MB	977	5	17	977	977	Seagate ST4053 Miniscribe3053/6053
42	41 MB	981	5	17	981	981	Miniscribe3053/6053 RLL

43	48 MB	830	7	17	512	830	Miniscribe 3650
44	69 MB	830	10	17	65535	830	Miniscribe 3650 RLL
45	114 MB	917	15	17	65535	918	Conner CP3104
46	152 MB	1224	15	17	65535	1223	Conner CP3204
User							

APPENDIX D: PROBLEM SHEET

1. Customer Data

Name
Address

Tel. No.
Fax. No.
Purchase Date

2. Mainboard Data

Model No. GA-
Serial No.

Rev. No.

3. System Configuration

CPU Type:
CPU Brand:
CPU Speed:
DRAM Type: ❑ 1 ❑ 2 ❑ 4 ❑ 8 ❑ 16 ❑ 32 MB
DRAM Speed: ❑ 80 ❑ 70 ❑ 60 ns
DRAM Total Size: MB
DRAM Brand:
SRAM Size: ❑ 64 KB ❑ 128 KB ❑ 256 KB ❑ 512 KB
SRAM Part No. TAG: DATA:
Video Card:
Video Chip or Brand:
Floppy Drive A Capacity & Brand:
Floppy Drive B Capacity & Brand:
Storage Controller Type ❑ MFM ❑ RLL ❑ IDE ❑ ESDI ❑ SCSI
Hard Drive C Brand & Type:
Hard Drive D Brand & Type:
LAN Controller Type
LAN Card Brand & Model:
Serial / Parallel Chip Brand & Model:
Mouse Brand & Model:
O. S. ❑ DOS ❑ OS/2 ❑ NETWARE ❑ UNIX / XENIX vER.:

4. AUTOEXEC.BAT & CONFIG.SYS File:

5. Problem Description: