

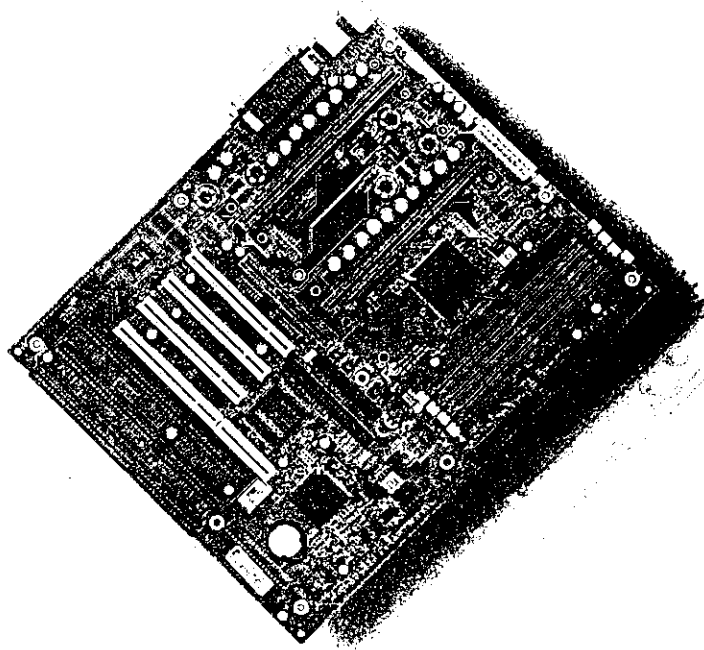
EXHIBIT 5

User's Manual

User's Manual

**GA-686DLX
PCI-ISA BUS
USER'S MANUAL**

PENTIUM® II PROCESSOR MAINBOARD



FCCE



POST-CONSUMER
RECYCLED PAPER



PRINTED In TAIWAN

FCC ID: M00111FL0001
FCC ID: M00111FL0001

DECLARATION OF CONFORMITY
FCC
Responsible Party Name: U.S. B. INC.
Address: 10000 1st Ave. S.E., Suite 100
Edmonds, WA 98149
Product Name: 686DLX
Model Number: 686DLX
Compliance to FCC Part 15.107 and 15.109
Signature: _____
Date: 10/10/97

FCC Compliance Statement:

This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that

interference will not occur in a particular installation. If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Move the equipment away from the receiver
- Plug the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for additional suggestions

You are cautioned that any change or modifications to the equipment not expressly approved by the party responsible for compliance could void Your authority to operate such equipment.

This device complies with Part 15 of the FCC Rules. Operation is subjected to the following two conditions 1) this device may not cause harmful interference and 2) this device must accept any interference received, including interference that may cause undesired operation.

686DLX

USER'S MANUAL

Pentium® II Processor MAINBOARD

REV. 1 Second Edition

R-01-02-080206

NOTE

- (1) Synnex product is a Pentium II 300MHz CPU submitted to FCC.
 (2) SCSI port is not available till now, Synnex doesn't provide this port before submitted to FCC.

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1. INTRODUCTION

1.1. PREFACE

Welcome to use the 686DLX motherboard. The motherboard is a Dual Pentium® II Processor based PC / AT compatible system with AGP / PCI / ISA Bus, and has been designed to be the fastest PC / AT system. 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

- ☐ Intel Dual Pentium® II Processor based PC / AT compatible motherboard.
- ☐ Dual Slot 1 on board supports dual Pentium® II processor running at 200-633MHz.
- ☐ Intel 440LX chipset, Support AGP / SDRAM / Ultra DMA/33 IDE / ACPI features.
- ☐ Support CPU FAN Failure / Overheat Alarm & auto slow down CPU speed.
- ☐ Support Intel LDCM® Network Manageability.
- ☐ Supports 4xDIMMs using 3.3V EDO or SDRAM DIMM module.
- ☐ Supports 8 MB - 1 GB EDO / 512MB SDRAM memory on board.
- ☐ Supports ECC or Non-ECC type DRAM module.
- ☐ Supports Ultra & Ultra Wide SCSI ports for 15 SCSI Device.
- ☐ 1xAGP slot, 4xPCI Bus slots(1 PCI slot support RAID port), 3xISA Bus slots.
- ☐ Supports 2 channels Ultra DMA/33 IDE ports for 4 IDE Device.
- ☐ Supports 2xCOM (16550), 1xLPT (EPP / ECP), 1x1.44MB Floppy port.
- ☐ Supports 2xUSB ports, 1xPS/2 Mouse & 1xPS/2 Keyboard ports.
- ☐ Licensed AWARD BIOS, 2M bit FLASH RAM.
- ☐ ATX form factor, Double stack I/O connector, 4 layers PCB.

1.5. INTRODUCE THE Pentium® II Processor & AGP

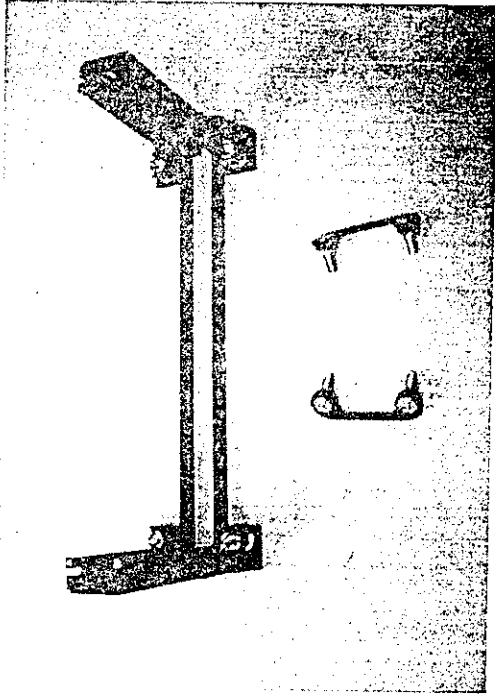


Figure 1: Retention Mechanism & attach Mount

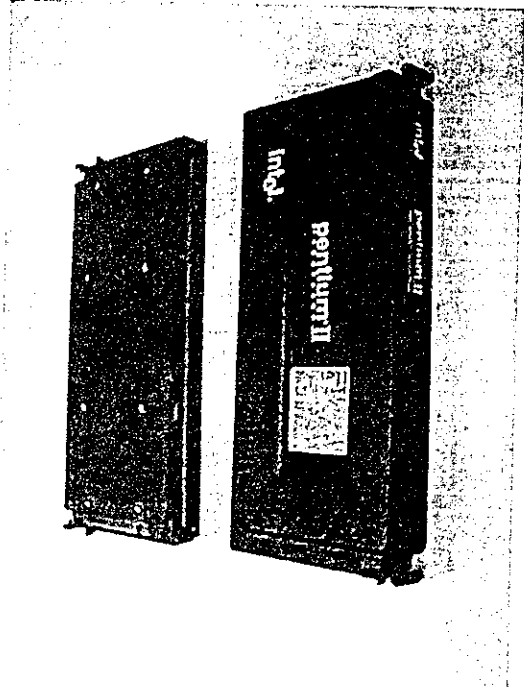


Figure 2: OEM Pentium® II Processor

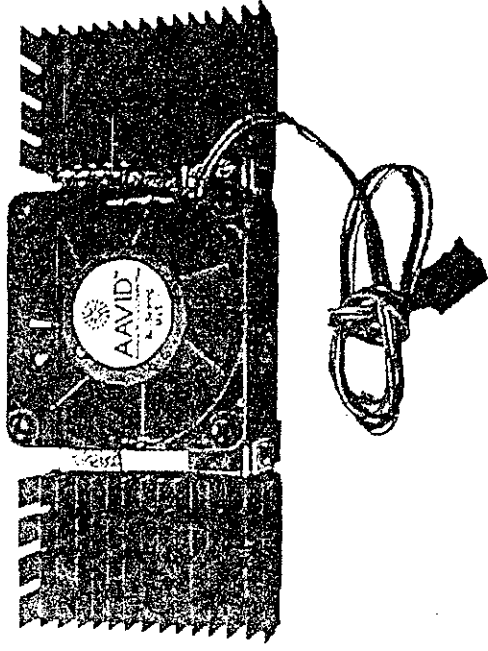


Figure 3: Heatsink / FAN & Heat sink support for OEM Pentium® II Processor

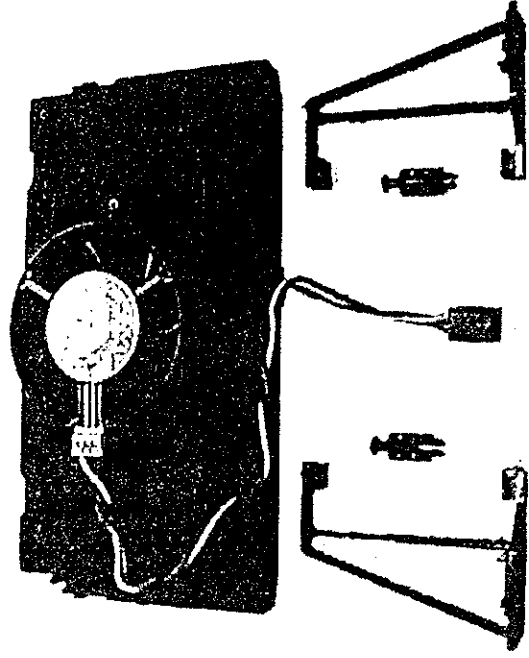


Figure 4: Boxed Pentium® II Processor & Heat sink support

• I/O PORTS

- Supports 2 16550 COM ports. (Using IRQ4, 3)
- Supports 1 EPP/ECP LPT port. (Using IRQ7 or 5 and DMA3 or 1)
- Supports 1 1.44/2.88 MB Floppy port. (Using DMA2 & IRQ6)
- Supports 2 USB ports.
- Supports PS/2 Mouse. (Using IRQ12)
- Supports PS/2 Keyboard. (Using IRQ1)
- Suspend mode support.
- Green switch & LED support.
- IDE & Display power down support.
- Monitor all IRQ / DMA / Display / I/O events.
- 256KB FLASH EEPROM.
- Supports Plug & Play, DMI, ACPI Function.
- ATX Form Factor, 4 layers PCB.

• GREEN FUNCTION

• BIOS

• DIMENSION

2.2. SOFTWARE

• DRIVER

- Intel LDCM® optional.
- Health monitor Utility.
- Bus Master IDE Driver.
- Suspend to HD Utility.
- ULTRA WIDE SCSI Driver.
- Licensed AWARD BIOS.

• BIOS

- AT CMOS Setup, BIOS / Chipset Setup, Green Setup, Hard Disk Utility included.
- Monitor Health status.

• O.S.

- Operation with MS-DOS®, Windows®95, WINDOWS™ NT, OS/2, NOVELL and SCO UNIX.

2.3. ENVIRONMENT

- Ambient Temp.
 - 0°C 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.
 - Max. 20A current at 5V.

3. HARDWARE INSTALLATION

3.1. UNPACKING

The mainboard package should contain the following:

- The 686DLX mainboard.
- The Retention Mechanism & Attach Mount
- USER'S MANUAL for mainboard.
- Cable set for IDE - Floppy & SCSI Device.
- Diskette & CD for SCSI Controller & Mainboard Utility.

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 mainboard. The mounting hole pattern on the mainboard matches the ATX system board. It is assumed that the chassis is designed for a standard ATX mainboard mounting.

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

◆ J8: Hard Disk active LED (HD-LED)	
Pin No.	Function
1	LED POWER (+)
2	LED POWER (-)
3	NC
4	LED POWER (+)

◆ J9: INFRARED Connector (IR) -- Function Option	
Pin No.	Function
1	IR Data Output
2	GND
3	IR Data Input
4	NC
5	POWER (+)

◆ J10: GN-SW	
On - Off for enter suspend Green Mode.	

◆ J11: Soft Power Switch	
On - Off for POWER ON or Suspend IN / OUT.	
On 4 sec. For POWER OFF before VGA Enable or CMOS setup select "delay 4sec." For POWER OFF mode.	

◆ J12: Green LED	
OFF	Normal mode
ON	Suspend mode

◆ J16: Wake on Lan	
Pin No.	Function
1	+5V SB.
2	GND
3	Signal.

◆ JP5: ATX POWER USE only	
Pin No.	Function
ON	System After AC BACK: Full ON.
OFF	System After AC BACK: Soft OFF.

◆ S1: CPU INT. / EXT. FREQ. RATIO				
CPU TYPE	1	2	3	4
200MHz	OFF	ON	OFF	OFF
233MHz	ON	ON	OFF	OFF
266MHz	OFF	OFF	ON	OFF
300MHz	ON	OFF	ON	OFF
333MHz	OFF	ON	ON	OFF
366MHz	ON	ON	ON	OFF

◆ POWER1: ATX POWER connector	
Pin No.	Function
3,5,7,13,15-17	GND
4,6,19,20	VCC (+5V)
10	+12V
12	-12V
18	-5V
8	Power Good
9	5V SB (Stand by +5V)
14	PS-ON (Soft ON/OFF)

3.4. DRAM INSTALLATION

The mainboard can be installed with 4 / 8 / 16 / 32 / 64 / 128 / 256 MB 168 pins DIMM module DRAM, and the DRAM speed must be 50 or 60 ns for EDO & 67~100 MHz for SDRAM. The DRAM memory system on mainboard consists of bank 0, 1, 2 & bank 3.

Because the 168 pins DIMM module is 64 bits width, using 1 PCS which can match a 64 bits system. The total memory size is 8 MB ~ 1 GB EDO / 512MB SDRAM. The DRAM installation position refer to Figure 3.1, and notice the Pin 1 of DIMM module must match with the Pin 1 of DIMM socket. Insert the DIMM module into the DIMM socket at Vertical angle. If there is a wrong direction of Pin 1, the DRAM DIMM module couldn't be inserted into socket completely.

3.11. SCSI DEVICE INSTALLATION

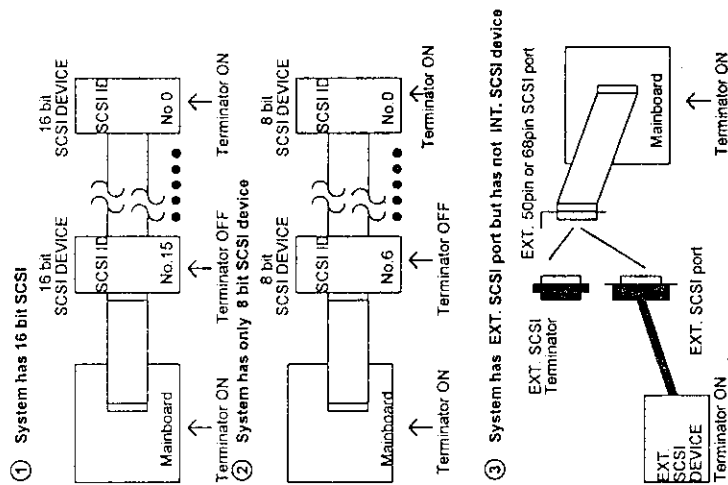
There are two SCSI ports on board, One is 8bit SCSI port for SCSI-2 or ULTRA SCSI device, and total 7 8bit SCSI devices can exist in a system.

The other is 16bit SCSI port for wide or ULTRA Wide SCSI device, and total 15 SCSI devices (include 8bit SCSI device) can exist in a system.

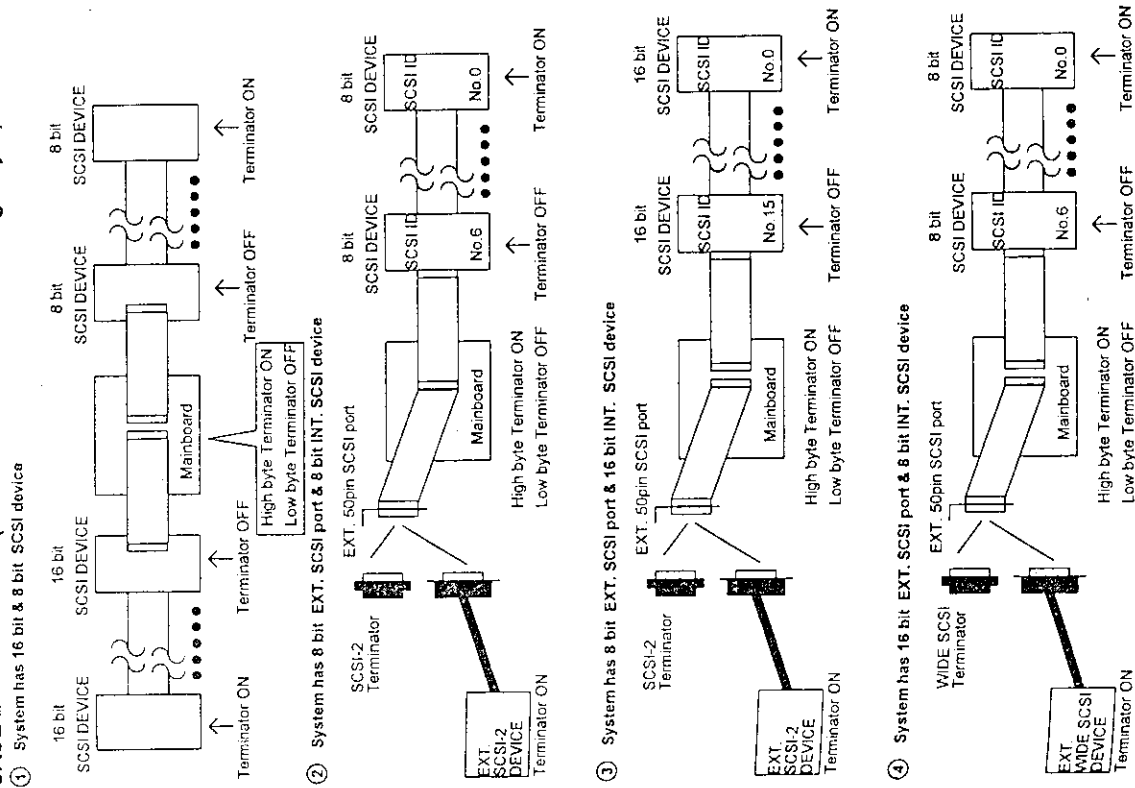
The low byte Terminator (used for 8bit SCSI port) and High byte Terminator (used for Wide SCSI port) turning "ON" or "OFF" are controlled by BIOS SETUP (includes INTEGRATED PERIPHERALS SETUP PAGE).

Terminator ON/OFF rules

CASE 1: BIOS SETUP(SCSI Terminator Enable: Both)



CASE 2: BIOS SETUP (SCSI Terminator Enable: High Byte)



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 4.1) will appear on the screen. The Main Menu allows you to select from nine setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

ROM PCI / ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	USER PASSWORD
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SAVE & EXIT SETUP
POWER MANAGEMENT SETUP	EXIT WITHOUT SAVING
PNP/PCI CONFIGURATION	
INTEGRATED PERIPHERALS	
LOAD SETUP DEFAULTS	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift)F2 : Change Color
Time, Date, Hard Disk Type, ...	

Figure 4.1: Main Menu

- Standard CMOS setup

This setup page includes all the items in 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 items of Green function features.

- PNP/PCI configuration

This setup page includes all the configurations of PCI & PNP ISA resources.

- Integrated peripherals

This setup page includes all onboard peripherals.

- Load setup defaults

Setup defaults indicates the most appropriate value of the system parameter which the system would be in safe configuration.

- User password

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 saving

Abandon all CMOS value changes and exit setup.

• Floppy 3 Mode Support (for Japan Area)

Disabled	Normal Floppy Drive
Drive A	Drive A is 3 mode Floppy Drive
Drive B	Drive B is 3 mode Floppy Drive
Both	Drive A & B are 3 mode Floppy Drives

• Video

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

EGAVGA	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.

NO Errors	The system boot will not stop for any error that may be detected
All Errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted
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 640 K; 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 64 K 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 640 K to 1024 K 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.

• Boot Up Floppy Seek

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

Enabled	BIOS searches for floppy disk drive to determine it is 40 or 80 tracks. Note that BIOS can not tell from 720 K, 1.2 M or 1.44 M 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 360 K

• Boot Up NumLock Status

The default value is On.

On	Keypad is number keys
Off	Keypad is arrow keys

• Typematic Rate Setting

The default value is Disabled.

Enabled	Enable Keyboard Typematic rate setting.
Disabled	Disable Keyboard Typematic rate setting.

• Typematic Rate (Chars / Sec)

The default value is 6.

6-30	Set the maximum Typematic rate from 6 chars. Per second to 30 chars. Per second.
------	--

• Typematic Delay (Msec)

The default value is 250.

250-1000	Set the time delay from first key to repeat the same key in to computer.
----------	--

• VGA Boot From

The default value is AGP.

AGP	Boot From AGP
PCI	Boot From PCI

• Security Option

This category allows you to limit access to the system and Setup, or just to Setup. The default value is Setup.

System	The system can not boot and can not access to Setup page will be denied if the correct password is not entered at the prompt
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt

To disable security, select **PASSWORD SETTING** at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup page freely.

• PCI/VGA Palette Snoop

The default value is Disabled.

Enabled	For having Video Card on ISA Bus and VGA Card on PCI Bus.
Disabled	For VGA Card only.

• MPS Version control For OS

The default value is 1.4.

1.4	Enable MP spec. Ver.1.4.
1.1	Enable MP spec. Ver.1.1. (for some OS, ie SCO UNIX)

• OS Select For DRAM>64MB

The default value is Non-OS2.

Non-OS2	Using non-OS2 operating system.
OS2	Using OS2 operating system and DRAM>64MB.

- Delayed Transaction

The default value is Disabled.

Disabled	Normal operation.
Enabled	For slow speed ISA device in system.

- SDRAM RAS-to-CAS Delay

The default value is Fast.

Slow	For Slow SDRAM DIMM module.
Fast	For Fast SDRAM DIMM module.

- SDRAM RAS Precharge Time

The default value is Fast.

Slow	For Slow SDRAM DIMM module.
Fast	For Fast SDRAM DIMM module.

- SDRAM CAS latency Time

The default value is 2.

3	For Slow SDRAM DIMM module.
2	For Fast SDRAM DIMM module.

- CPU Temperature Select

The default value is 75°C / 167°F.

70°C / 158°F	Monitor CPU Temp. at 70°C / 158°F, if Temp. > 70°C / 158°F will cause system alarming & slow down CPU speed.
75°C / 167°F	Monitor CPU Temp. at 75°C / 167°F, if Temp. > 75°C / 167°F will cause system alarming & slow down CPU speed.
Disabled	Disable monitors CPU Temp. (Overheat) function.

- CPU1 Fan Failure Control

The default value is Disabled.

Disabled	Disable monitor CPU FAN working status.
Enabled	Enable monitor CPU FAN working status.

- CPU2 Fan Failure Control

The default value is Disabled.

Disabled	Disable monitor CPU FAN working status.
Enabled	Enable monitor CPU FAN working status.

- CPU Fan Status

The default value depends on system monitoring CPU FAN status.

Fail	The CPU FAN fails to work.
OK	The CPU FAN works normally.
Ignore	Ignore

- CPU Temperature

The default value is OK.

High	CPU overheats. (CPU Temperature is out of SPEC.)
OK	CPU Temp. is in SPEC.

- Power Supply $\pm 12V / \pm 5V$

The default value depends on system monitoring $\pm 12V / \pm 5V$ voltage status.

Fail	The $\pm 12V / \pm 5V$ voltage from Power supply is out of SPEC.
OK	The $\pm 12V / \pm 5V$ voltage from Power supply is in SPEC.

- HDD Power Down

The default value is Disable.

Disable	Disable HDD Power Down mode function.
1-15 mins	Enable HDD Power Down mode between 1 to 15 mins.

- Suspend Mode Option

The default value : PowerOn Suspend

PowerOn Suspend	Set the system to PowerOn Suspend mode
Suspend to Disk	Set the system to Suspend to Disk mode

- VGA Active Monitor

The default value is Disabled.

Disabled	Disable monitor VGA activity.
Enabled	Enable monitor VGA activity.

- Soft-off by PWR-BTTN

The default value is Instant-off.

Instant-off	Soft switch ON/OFF for POWER ON/OFF
Delay 4 Sec.	Soft switch ON 4sec. for POWER OFF.

- CPUFAN off In Suspend

The default value is Disabled.

Disabled	Disable this function.
Enabled	Stop CPU FAN when entering Suspend mode.

- Resume by Alarm

The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable alarm function to POWER ON system.

If the default value is Enabled.

Date (of Month) Alarm :	0~31
Time (hh: mm: ss) Alarm :	(0~23) : (0~59) : (0~59)

- IRQ [3-7,9-15] , NMI

The default value is Enabled.

Disabled	Disable this function.
Enabled	Enable monitor IRQ [3-7,9-15] for Green event.

- Primary IDE 0/1

The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable monitor Primary IDE 0/1 for Green event.

- Secondary IDE 0/1

The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable monitor Secondary IDE 0/1 for Green event.

- Floppy Disk

The default value is Enabled.

Disabled	Disable this function.
Enabled	Enable monitor Floppy Disk for Green event.

4.10. INTEGRATED PERIPHERALS

ROM PCI / ISA BIOS
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	ESC : Quit	↑ ↓ → ←	: Select Item
IDE Primary Master PIO	: Auto	F1 : Help	PU/PD/+/-	: Modify
IDE Primary Slave PIO	: Auto	F5 : Old Values	(Shift)F2	: Color
IDE Secondary Master PIO	: Auto	F7 : Load Setup Defaults		
IDE Primary Master UDMA	: Auto			
IDE Primary Slave UDMA	: Auto			
IDE Secondary Master UDMA	: Auto			
IDE Secondary Slave UDMA	: Auto			
On-Chip Primary PCI IDE	: Enabled			
On-Chip Secondary PCI IDE	: Enabled			
Onboard PCI SCSI Chip	: Enable			
SCSI Terminator Enable	: Both			
USB Keyboard Support	: Disabled			
Onboard FDC Controller	: Enabled			
Onboard Serial Port1	: COM1/3/F8			
Onboard Serial Port2	: AUTO			
Onboard Parallel Port	: 378/IRQ7			
Parallel Port Mode	: SPP			

Figure 4.7: Load Setup Defaults

- IDE HDD Block Mode

The default value is Enabled.

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

- IDE Primary Master PIO (for onboard IDE 1st channel).

The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Mode0~4	Manually set the IDE Accessing mode.

- IDE Primary Slave PIO (for onboard IDE 1st channel).

The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Mode0~4	Manually set the IDE Accessing mode.

- IDE Secondary Master PIO (for onboard IDE 2nd channel).

The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Mode0~4	Manually set the IDE Accessing mode.

- IDE Secondary Slave PIO (for onboard IDE 2nd channel).

The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Mode0~4	Manually set the IDE Accessing mode.

- IDE Primary Master UDMA.

The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Disabled	Disable UDMA function.

- IDE Primary Slave UDMA.

The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Disabled	Disable UDMA function.

- Onboard Serial Port 2

The default value is AUTO.

Auto	BIOS will automatically setup the port 2 address.
COM1/3F8	Enable onboard Serial port 2 and address is 3F8.
COM2/2F8	Enable onboard Serial port 2 and address is 2F8.
COM3/3E8	Enable onboard Serial port 2 and address is 3E8.
COM4/2E8	Enable onboard Serial port 2 and address is 2E8.
Disabled	Disable onboard Serial port 2.

- Onboard Parallel port

The default value is 378/IRQ7.

378/IRQ7	Enable onboard LPT port and address is 378/IRQ7.
278/IRQ5	Enable onboard LPT port and address is 278/IRQ5.
Disabled	Disable onboard LPT port.
3BC/IRQ7	Enable onboard LPT port and address is 3BC/IRQ7.

- Parallel Port Mode

The default value is SPP.

SPP	Using Parallel port as Standard Printer Port.
EPP	Using Parallel port as Enhanced Parallel Port.
ECP	Using Parallel port as Extended Capabilities Port.
ECP/EPP	Using Parallel port as ECP & EPP mode.

4.11. LOAD SETUP DEFAULTS

ROM PCI / ISA BIOS
LOAD SETUP DEFAULTS
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	USER PASSWORD
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SAVE & EXIT SETUP
POWER MANAGEMENT SETUP	EXIT WITHOUT SAVING
PNP/PCI CONFIGURATION	Load SETUP Defaults (Y/N)?
INTEGRATED PERIPHERALS	
LOAD SETUP DEFAULTS	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift)F2 : Change Color
Load SETUP Defaults except Standard CMOS SETUP	

Figure 4.7: Load Setup Defaults

- Load SETUP Defaults

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

4.14. SAVE & EXIT SETUP

ROM PCI / ISA BIOS
SAVE & EXIT SETUP
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	USER PASSWORD
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SAVE & EXIT SETUP
POWER MANAGEMENT SETUP	EXIT WITHOUT SAVING
PNP/PCI CONFIGURATION	Quit Without Saving (Y/N)? N
INTEGRATED PERIPHERALS	
LOAD SETUP DEFAULTS	
ESC : Quit F10 : Save & Exit Setup ↑ ↓ → ← : Select Item (Shift)F2 : Change Color	
Save Data to CMOS & Exit SETUP	

Figure 4.10: 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.

4.15. EXIT WITHOUT SAVING

ROM PCI / ISA BIOS
EXIT WITHOUT SAVING
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	USER PASSWORD
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SAVE & EXIT SETUP
POWER MANAGEMENT SETUP	EXIT WITHOUT SAVING
PCI CONFIGURATION	Quit Without Saving (Y/N)? N
INTEGRATED PERIPHERALS	
LOAD SETUP DEFAULTS	
ESC : Quit F10 : Save & Exit Setup ↑ ↓ → ← : Select Item (Shift)F2 : Change Color	
Abandon all Datas & Exit SETUP	

Figure 4.11: Exit Without Saving

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

Type "N" will return to Setup Utility.

4.12. USER PASSWORD

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

ROM PCI / ISA BIOS
USER PASSWORD
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	USER PASSWORD
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SAVE & EXIT SETUP
POWER MANAGEMENT SETUP	EXIT WITHOUT SAVING
PNP/PCI CONFIGURATION	Enter Password
INTEGRATED PERIPHERALS	
LOAD SETUP DEFAULTS	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift)F2 : Change Color
Change / Set / Disable Password	

Figure 4.8: Password Setting

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.

4.13. IDE HDD AUTO DETECTION

ROM PCI / ISA BIOS
IDE HDD AUTO DETECTION
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Select Primary Master Option (N-Skip): N								
OPTION	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE	
1 (Y)	521	1060	16	65535	1059	63	NORMAL	
2	521	530	32	0	1059	63	LBA	
3	521	530	32	65535	1059	63	LARGE	

Note: Some OSes (like SCO-UNIX) must use "NORMAL" for installation

Figure 4.9: 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. If the hard disk cylinder NO. is over 1024, then the user can select LBA mode or LARGER mode for DOS partition LARGER than 528 MB.

- IDE Secondary Master UDMA.

The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Disabled	Disable UDMA function.

- IDE Secondary Slave UDMA.

The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Disabled	Disable UDMA function.

- On-Chip Primary PCI IDE

The default value is Enabled.

Enabled	Enable onboard 1st channel IDE port.
Disabled	Disable onboard 1st channel IDE port.

- On-Chip Secondary PCI IDE

The default value is Enabled.

Enabled	Enable onboard 2nd channel IDE port.
Disabled	Disable onboard 2nd channel IDE port.

- Onboard PCI SCSI Chip

The default value is Enabled.

Enabled	Enable onboard SCSI port.
Disabled	Disable onboard SCSI port.

- SCSI Terminator Enable

The default value is Both.

Both	Support All SCSI Device.
None	Disable SCSI Device Support.
Low Byte	Low Byte-ON.
High Byte	High Byte-ON.

- USB Keyboard Support

The default value is Disabled.

Enabled	Enable USB Keyboard Support.
Disabled	Disable USB Keyboard Support.

- Onboard FDD Controller

The default value is Enabled.

Enabled	Enable onboard FDD port.
Disabled	Disable onboard FDD port.

- Onboard Serial Port 1

The default value is COM1/3F8.

Auto	BIOS will automatically setup the port 1 address.
COM1/3F8	Enable onboard Serial port 1 and address is 3F8.
COM2/2F8	Enable onboard Serial port 1 and address is 2F8.
COM3/3E8	Enable onboard Serial port 1 and address is 3E8.
COM4/2E8	Enable onboard Serial port 1 and address is 2E8.
Disabled	Disable onboard Serial port 1.

- Serial Port

The default value is Enabled.

Disabled	Disable this function.
Enabled	Enable monitor Serial Port for Green event.

- Parallel Port

The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable monitor Parallel Port for Green event.

4.9. PNP/PCI CONFIGURATION

ROM PCI /ISA BIOS
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

PNP OS Installed	No	Manual	Disabled	Used MEM base addr	N/A
Resources Controlled by				*Used MEM Length	8K
Reset Configuration Data					
IRQ-3 assigned to			Legacy ISA		
IRQ-4 assigned to			Legacy ISA		
IRQ-5 assigned to			PCI/ISA PnP		
IRQ-7 assigned to			Legacy ISA		
IRQ-9 assigned to			PCI/ISA PnP		
IRQ-10 assigned to			PCI/ISA PnP		
IRQ-11 assigned to			PCI/ISA PnP		
IRQ-12 assigned to			Legacy ISA		
IRQ-14 assigned to			Legacy ISA		
IRQ-15 assigned to			Legacy ISA		
DMA-0 assigned to			PCI/ISA PnP		
DMA-1 assigned to			PCI/ISA PnP		
DMA-3 assigned to			PCI/ISA PnP		
DMA-5 assigned to			PCI/ISA PnP		
DMA-6 assigned to			PCI/ISA PnP		
DMA-7 assigned to			PCI/ISA PnP		
				ESC : Quit	↑ ↓ → ← : Select Item
				F1 : Help	PU/PD/H/L : Modify
				F5 : Old Values	(Shift)F2 : Color
				F7 : Load Setup Defaults	

Figure 4.6: PCI Slot Configuration

* This item will show up when Used MEM base addr has been set.

- PNP OS Installed

The default value is No.

Yes	Enable PNP OS Installed function.
No	Disable PNP OS Installed function.

- Resources Controlled by

The default value is Manual.

Manual	User can set the PnP resource (I/O Address, IRQ & DMA channels) used by legacy ISA DEVICE.
Auto	BIOS automatically use these PnP resources.

- Reset Configuration Data

The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable clear PnP information in ESCD.

- IRQ (3,4,5,7,9,10,11,12,14,15), DMA(0,1,3,5,6,7) assigned to

The default value is "Legacy ISA" or "PCI/ISA PnP".

Legacy ISA	The resource is used by Legacy ISA device.
PCI/ISA PnP	The resource is used by PCI/ISA PnP device (PCI or ISA).

- Used MEM base addr

The default value is N/A.

N/A	Disable the MEM. block using.
C800 ~ DC00	Select the MEM. block starting address.

- Used MEM Length

The default value is 8K.

8K ~ 64K	Select the MEM. block size.
----------	-----------------------------

- Battery Status

The default value depends on system monitoring Battery status.

Fail	The Battery (3V) voltage is out of SPEC.
OK	The Battery (3V) voltage is in SPEC.

- CPU VCore Voltage

1.8V~3.5V	The voltage is current setting for CPU.
-----------	---

4.8. POWER MANAGEMENT SETUP

ROM PCI / ISA BIOS
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management PM Control by APM	Enable Yes	•• Reload Global Timer Events IRQ [3-7,9-15] NMI : Enabled Primary IDE 0 : Disabled Primary IDE 1 : Disabled Secondary IDE 0 : Disabled Secondary IDE 1 : Disabled Floppy Disk : Enabled Serial Port : Enabled Parallel Port : Disabled
Suspend Mode	Disable	
HDD Power Down	Disable	
Suspend Mode option	PowerOn Suspend	
VGA Active Monitor	Disabled	
Soft-off by PWR-BT TN	Instant-off	
CPU FAN off In Suspend	Disabled	
Resume by Alarm	Disabled	
*• Date (of Month) Alarm : 00.00.00 *• Time (hh:mm:ss) Alarm : 00.00.00 *• ESC : Quit ↑ ↓ → ← : Select Item F1 : Help PUPD/+/- : Modify F5 : Old Values (Shift)F2 : Color F7 : Load Setup Defaults		

Figure 4.5: Power Management Setup

- * This item will show up when user uses ATX power supply.
- ** These two items will show up when Resume by Alarm is enabled.

- Power Management

The default value is Enabled.

Enabled	Enable Green function.
Disabled	Disable Green function.

- PM Control by APM

The default value is Yes.

Yes	Enable software APM function.
No	Disable software APM function.

- Suspend Mode

The default value is Disable.

Disabled	Disable Suspend Mode.
1 min. ~ 1 Hour	Setup the timer to enter Suspend Mode.

• Video BIOS Shadow

It determines whether video BIOS is able to copy 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 16 K byte. The default value are Disabled.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

4.7. CHIPSET FEATURES SETUP

ROM PCI / ISA BIOS
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	CPU Temperature Select	: 75 °C / 167 °F
DRAM Speed Selection	: Normal	CPU1 Fan Failure Control	: Disabled
Memory Buffer Strength	: Middle	CPU2 Fan Failure Control	: Disabled
DRAM Data Integrity Mode	: Non-ECC	CPU Fan Status	: Ignore
Video RAM Cacheable	: Disabled	CPU Temperature	: OK
Memory Hole At 15M-16M	: Disabled	Power Supply +12V	: OK
Delayed Transaction	: Disabled	Power Supply -12V	: OK
SDRAM RAS-to-CAS Delay	: Fast	Power Supply +5V	: OK
SDRAM RAS Precharge Time	: Fast	Power Supply -5V	: OK
SDRAM CAS latency Time	: 2	Battery Status	: OK
		CPU VCore Voltage	: 2.8V
		ESC : Quit	↑ ↓ → ← : Select Item
		F1 : Help	PU/PD/+/ -: Modify
		F5 : Old Values	(Shift)F2 : Color
		F7 : Load Setup Defaults	

Figure 4.4: Chipset Features Setup

• Auto Configuration

The default value is Enabled.

Enabled	For 50 - 60ns EDO DRAM Timing.
Disabled	For slow speed DRAM Timing.

• DRAM Speed Selection

The default value is Normal.

Normal	For normal DRAM operation.
Fast	For Fastest DRAM timing operation.

• Memory Buffer Strength

The default value is Middle.

Middle	For Middle Memory Buffer strength.
Low	For Low Memory Buffer strength.
High	For High Memory Buffer strength.

• DRAM Data Integrity Mode

The default value is Non-ECC.

Non-ECC	For 64bit standard type DIMM module.
ECC	For 72bit ECC type DIMM module.

• Video RAM Cacheable

The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable this function to get better VGA performance; while some brands of VGA must be disabled this function (e.g. ET4000W32P).

• Memory Hole At 15M-16M

The default value is Disabled.

Disabled	Normal Setting.
Enabled	Set Address=15~16MB remap to ISA BIOS.

4.6. BIOS FEATURES SETUP

ROM PCI/ISA BIOS
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000 - C8FFF Shadow	: Disabled
External Cache	: Enabled	CC000 - CFFFF Shadow	: Disabled
CPU L2 Cache ECC Checking	: Disabled	D0000 - D3FFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D4000 - D7FFF Shadow	: Disabled
CPU Update Data	: Enabled	D8000 - DBFFF Shadow	: Disabled
Root Sequence	: A, C, SCSI	DC000 - DFFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled		
VGA Boot From	: AGP		
Root Up Floppy Seek	: Enabled		
Root Up NumLock Status	: On		
TypeMatic Rate Setting	: Disabled		
TypeMatic Rate (Chars/Sec)	: 6		
TypeMatic Delay (Msec)	: 250		
Security Option	: Setup		
PCI/VGA Palette Snoop	: Disabled		
NPS Version Control For OS	: 1, 4		
OS Select For DRAM >=64MB	: Non-OS2		

Figure 4.3: BIOS Features Setup

• Virus Warning

This category flashes on the screen during 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

• CPU L2 Cache ECC Checking

The default value is Disabled.

Enabled	Enable CPU L2 Cache ECC Checking
Disabled	Disable CPU L2 Cache ECC Checking

• 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

• CPU Update Data

The default value is Enabled.

Enabled	Enable CPU Update Data
Disabled	Normal CPU Update Data

• Boot Sequence

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

X1, X2, X3	System will first search for X1 disk drive then X2 disk drive and then X3 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

4.5. STANDARD CMOS SETUP MENU

The items in Standard CMOS Setup Menu (Figure 4.2) 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.

ROM PCI / ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm/dd/yy) Mon, Aug 25 1997		Time (hh:mm:ss) 16																																														
<table border="1"> <thead> <tr> <th>HARD DISKS</th> <th>TYPE</th> <th>SIZE</th> <th>CYL</th> <th>HEAD</th> <th>PRECOMP</th> <th>LANDZ</th> <th>SECTOR</th> <th>MODE</th> </tr> </thead> <tbody> <tr> <td>Primary Master</td> <td>Auto</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>AUTO</td> </tr> <tr> <td>Primary Slave</td> <td>None</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>---</td> </tr> <tr> <td>Secondary Master</td> <td>None</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>---</td> </tr> <tr> <td>Secondary Slave</td> <td>None</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>---</td> </tr> </tbody> </table>				HARD DISKS	TYPE	SIZE	CYL	HEAD	PRECOMP	LANDZ	SECTOR	MODE	Primary Master	Auto	0	0	0	0	0	0	AUTO	Primary Slave	None	0	0	0	0	0	0	---	Secondary Master	None	0	0	0	0	0	0	---	Secondary Slave	None	0	0	0	0	0	0	---
HARD DISKS	TYPE	SIZE	CYL	HEAD	PRECOMP	LANDZ	SECTOR	MODE																																								
Primary Master	Auto	0	0	0	0	0	0	AUTO																																								
Primary Slave	None	0	0	0	0	0	0	---																																								
Secondary Master	None	0	0	0	0	0	0	---																																								
Secondary Slave	None	0	0	0	0	0	0	---																																								
Drive A : 1.44M, 3.5 in Drive B : None Floppy 3 Mode Support : Disabled Video : EGA/VGA Halt On : All Errors																																																
<table border="1"> <tr> <td>Base Memory</td> <td>640 K</td> </tr> <tr> <td>Extended Memory</td> <td>13160 K</td> </tr> <tr> <td>Other Memory</td> <td>384 K</td> </tr> <tr> <td>Total Memory</td> <td>16384 K</td> </tr> </table>				Base Memory	640 K	Extended Memory	13160 K	Other Memory	384 K	Total Memory	16384 K																																					
Base Memory	640 K																																															
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Other Memory	384 K																																															
Total Memory	16384 K																																															
ESC : Quit	↑ ↓ → ←	Select Item	PU/PD/H/- : Modify																																													
F1 : Help	(Shift)F2	Change Color																																														

Figure 4.2: Standard CMOS Setup Menu

• 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 1994 through 2079

• Time

The times 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.

• Primary HDDs / Secondary HDDs

The category identifies the types of hard disk drive C drives F 4 devices that has been installed in the computer. There are two types: auto type, and user definable type. User type is user-definable; Auto type which will automatically detect HDD's type.

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 you select User Type, 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.

CYL.	Number of cylinders
HEADS	number of heads
PRECOMP	write precomp
LANDZONE	landing zone
SECTORS	number of sectors

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

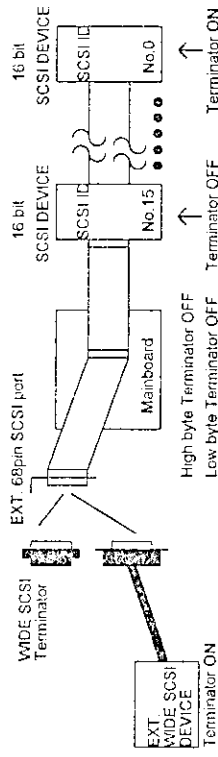
• Drive A type / Drive B type

The category identifies 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.	5.25 inch PC-type standard drive; 360K byte capacity.
1.2M, 5.25 in.	5.25 inch AT-type high-density drive; 1.2M byte capacity (3.5 inch when 3 Mode is Enabled).
720K, 3.5 in.	3.5 inch double-sided drive; 720K byte capacity
1.44M, 3.5 in.	3.5 inch double-sided drive; 1.44M byte capacity.
2.88M, 3.5 in.	3.5 inch double-sided drive; 2.88M byte capacity.

CASE 3: BIOS SETUP(SCSI Terminator Enable: None)

① System has 16 bit EXT. SCSI port & INT. 16 bit SCSI device

**3.12. PERIPHERAL DEVICE INSTALLATION**

After the I/O 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.

If the PCI - Bus device is to be installed in the system, any one of five PCI - Bus slots can be used.

3.13. KEYBOARD & PS/2 MOUSE INSTALLATION

The main board supports PS/2 connector type keyboard & Mouse (CN4).

The BIOS will auto detect whether the PS/2 Mouse is installed or not & assign IRQ12 for Mouse port if which was installed.

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

3.14. 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 (Software Reset).
----------------	--

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 immediately will allow you to enter Setup. 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" button on the system case. You may also restart by simultaneously press <Ctrl>, <Alt>, and keys.

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	Reserved
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

3.5. CPU SPEED SETUP

The system's speed is fixed to 66.6MHz. The user can change the DIP SWITCH (S1) selection to set up the CPU speed for 200 - 633MHz processor. The CPU speed must match with the frequency RATIO. It will cause system hanging up if the frequency RATIO is higher than CPU's.

DIP SWITCH (S1)				FREQ. RATIO	EXT CLK. MHz	INT CLK. MHz	CPU Type
1	2	3	4				
OFF	ON	OFF	OFF	3	66	200	Pentium® II 200MHz
ON	ON	OFF	OFF	3.5	66	233	Pentium® II 233MHz
OFF	OFF	ON	OFF	4	66	266	Pentium® II 266MHz
ON	OFF	ON	OFF	4.5	66	300	Pentium® II 300MHz
OFF	ON	ON	OFF	5	66	333	Pentium® II 333MHz
ON	ON	ON	OFF	5.5	66	366	Pentium® II 366MHz

* 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.

3.6. CMOS RTC & ISA CFG CMOS SRAM

There're RTC & CMOS SRAM on board; they have a power supply from external battery to keep the DATA inviolate & effective. The RTC is a REAL-TIME CLOCK device, which provides the DATE & TIME to system. The CMOS SRAM is used for keeping the information of system configuration, so the system can automatically boot OS. every time. Due to the life-time of Battery internal battery is 5 years, the user can change a new Battery to replace old one after it can not work.

- * Danger of explosion if battery is incorrectly replaced.
- * Replace only with the same or equivalent type recommended by the manufacturer.
- * Dispose of used batteries according to the manufacturer's instructions.

3.7. 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 J5 on mainboard.

3.8. 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.

3.9. POWER LED CONNECTOR INSTALLATION

There are system power LED lamps on the panel of case. The power LED will light on when system is powered-on, which is connected to a 3 PIN connector.

The connector should be connected to J7 of mainboard in correct direction.

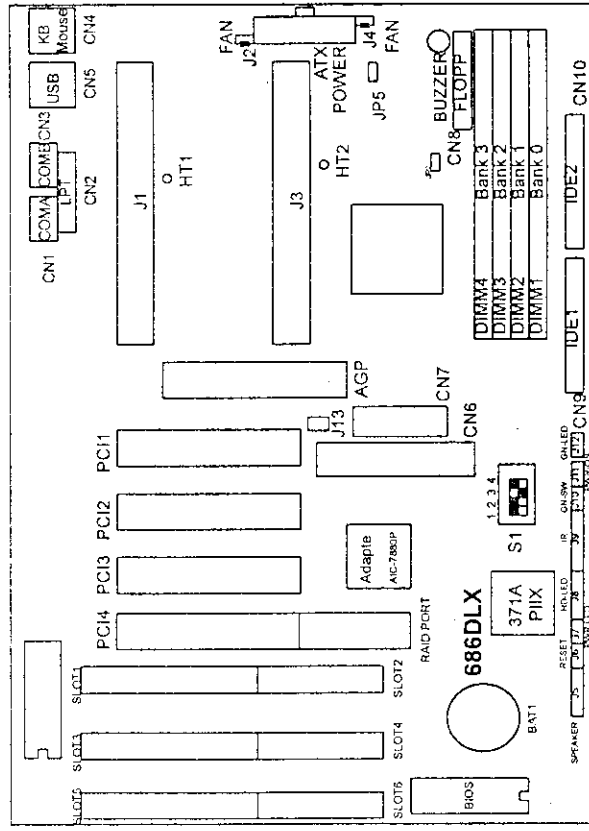
3.10. IDE & ATAPI DEVICE INSTALLATION

There are two Enhance PCI IDE ports (CN9,10) on board, which following ATAPI standard SPEC. Any one IDE port can connected to two ATAPI devices (IDE Hard Disk, CD-ROM & Tape Driver), so total four ATAPI devices can exist in a system.

The J8 is the active LED port for ATAPI device.

686DLX

3.2. MAINBOARD LAYOUT



<Figure 3.1>

3.3. QUICK REFERENCE FOR JUMPERS & CONNECTORS

◆ CN1-10 I/O Ports Connector	
CN1	For Serial port1 (COM A).
CN2	For LPT port.
CN3	For Serial port2 (COM B).
CN4	For PS/2 Mouse & Keyboard I/O ports.
CN5	For USB port.
CN6	For ULTRA 8 bit SCSI port.
CN7	For ULTRA WIDE SCSI port.
CN8	For Floppy port.
CN9	For Primary IDE port.
CN10	For Secondary IDE port.

◆ J1: slot1 (For CPU2) For Pentium® II processor installed.	
--	--

◆ J2: CPU2 cooling FAN Power Connector	
Pin No.	Function
1	GND.
2	+12V
3	SENSE

◆ J3: slot1 (For CPU1) For Pentium® II processor installed.	
--	--

◆ J4: CPU1 cooling FAN Power Connector	
Pin No.	Function
1	GND.
2	+12V
3	SENSE

◆ J5: SPEAKER Connector	
Pin No.	Function
1	VCC
2	NC.
3	NC.
4	Output

◆ J6: RESET Switch	
Pin No.	Function
1	RESET Input
2	GND

◆ J7: POWER ON LED (PW-LED)	
Pin No.	Function
1	LED POWER (+)
2	NC
3	GND (-)

1.6. What is AGP?

The Accelerated Graphics Port (AGP) is a new port on the Host-To-PCI bridge device that supports an AGP port. The main purpose of the AGP port is to provide fast access to system memory.

The AGP port can be used either as fast PCI port (32-bits at 66MHz vs. 32-bits at 33MHz) or as an AGP port which supports 2x data-rate, a read queue, and side band addressing. When the 2x-data rate is used the port can transmit data at 533Mb/sec (66.6*2*4). The read-queue can be used to pipeline reads ~ removing the effects of the reads-latency. Side band addressing can be used to transmit the data address on a separate line in order to further speed the transaction.

1.7. What is RAID PORT?

RAID PORT is the most popular in network server applications. For example, it is having four Levels 0, 1, 0/1 and 5 (The RAID Levels is depend on your RAID CARD).

RAID 0 (two driver minimum) is achieved by creating an array of striped disks. IF one driver in a RAID 0 system fails, all data on the array will be lost. RAID 0 is typically not used in network applications.

RAID 1 (two drivers) is as disk mirroring or duplexing. It's read performance is very good, because data can be read from either the primary or mirrored disk. However, it's write performance is slightly slower than with singal disks, because two requests must be issued to write the same data to both drivers.

RAID 0/1 (four driver minimum) is as RAID 0+1, combines the performance of data striping (RAID 0) with the fault tolerance of RAID1.

RAID 5 (three drivers minimum) strips blocks of data as well as parity data across all driver in the array, ensuring that no data will be lost in the event of a single driver failure. RAID 5 delivers improved performance by allowing multiple, simultaneous read and write requests but it unlike the other RAID levels.

2. SPECIFICATION

2.1. HARDWARE

- CPU
 - Dual Pentium® II processor 200 – 633 MHz.
 - Dual 242 pins 66MHz slot1 on board.
- PROTECTION
 - Onboard Buzzer Alarm when detect "CPU FAN Failure" or "CPU Overheat".
 - Automatically slow down CPU speed when "CPU FAN Failure" or "CPU Overheat".
 - Intel LDCM® support.
 - H/W monitor power status (±5V, ±12V, CPU voltage & CMOS battery voltage).
- SPEED
 - 66 MHz system speed.
 - 66 MHz AGP bus speed. (133MHz 2*mode)
 - 33 MHz PCI-Bus speed.
 - 8 MHz AT bus speed.
- DRAM MEMORY
 - 4 banks 168 pins DIMM module sockets on board.
 - Use 8 / 16 / 32 / 64 / 128 / 256 MB 60~70 ns DIMM module DRAM.
 - 8 ~ 1 GB DRAM size.
 - Support 3.3V SDRAM / EDO type DRAM.
 - Support ECC or Non-ECC type DRAM.
- CACHE MEMORY
 - 32 KB 1st cache memory included in CPU.
 - 256KB/512 KB 2nd cache in CPU.
 - Support DIB speed mode for L2 Cache.
- SCSI PORTS
 - Using Adaptec 7880P chipset.
 - Supports one SCSI-2 or SCSI-3 (Ultra) port.
 - Support one Ultra or Ultra Wide port.
 - Support Adaptec RAID Port™ on board.
- I/O BUS SLOTS
 - 1 66 / 133MHz AGP BUS.
 - 4 33MHz Master / Slave PCI-BUS.
 - 3 8MHz 16 bits ISA BUS.
- IDE PORTS
 - 2 Ultra DMA/33 Bus Master IDE channels on board. (Using IRQ14, 15)
 - Back ward Support Mode 3,4 IDE & ATAPI CD - ROM.

1.4. BLOCK DIAGRAM

Introduction

『NOTE』

- (1) Synnex provide a Pentium II 300MHz CPU submitted to FCC.
- (2) SCSI port is not available till now, Synnex doesn't provide this port before submitted to FCC.

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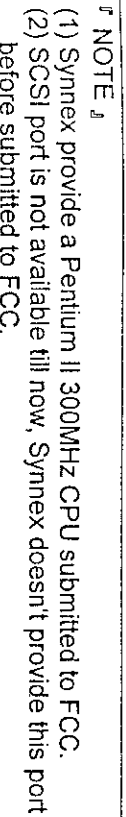


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The author assumes no responsibility for any errors or omissions which may appear in this document nor does it make a commitment to update the information contained herein.

Third-party brands and names are the property of their respective owners.

DECEMBER 06, 1997 Taipei, Taiwan

Declaration of Conformity

We, Manufacturer/Importer
(full address)

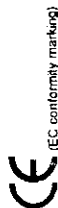
G.B.T. Technology Trading GmbH
Ausschlag Weg 41, 1F, 20537 Hamburg, Germany

declare that the product
(description of the apparatus, system, installation to which it refers)

Mother Board
GA-686DLX

is in conformity with
(reference to the specification under which conformity is declared)
in accordance with 89/336 EEC-EMC Directive

☐ EN 55011	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) high frequency equipment	☒ EN 61000-3-2 ☒ EN 60555-2	Disturbances in supply systems caused by household appliances and similar electrical equipment "Harmonics"
☐ EN 55013	Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment	☐ EN 61000-3-3 ☒ EN 60555-3	Disturbances in supply systems caused by household appliances and similar electrical equipment "Voltage fluctuations"
☐ EN 55014	Limits and methods of measurement of radio disturbance characteristics of household electrical appliances, portable tools and similar electrical apparatus	☒ EN 50081-1 ☒ EN 50082-1	Generic emission standard Part 1: Residual, commercial and light industry Generic immunity standard Part 1: Residual, commercial and light industry
☐ EN 55015	Limits and methods of measurement of radio disturbance characteristics of fluorescent lamps and luminaires	☐ EN 55081-2	Generic emission standard Part 2: Industrial environment
☐ EN 55020	Immunity from radio interference of broadcast receivers and associated equipment	☐ EN 55082-2	Generic immunity standard Part 2: Industrial environment
☒ EN 55022	Limits and methods of measurement of radio disturbance characteristics of information technology equipment	☐ ENV 55104	Immunity requirements for household appliances tools and similar apparatus
☐ EN 60955 ☐ part 16 ☐ part 12	Cabled distribution systems: Equipment for receiving and/or distribution from sound and television signals	☐ EN 50091-2	EMC requirements for uninterruptible power systems (UPS)



The manufacturer also declares the conformity of above mentioned product with the actual required safety standards in accordance with LVD 7323 EEC

☐ EN 60065	Safety requirements for mains operated electronic and related apparatus for household and similar general use	☐ EN 60950	Safety for information technology equipment including electrical business equipment
☐ EN 60335	Safety of household and similar electrical appliances	☐ EN 50091-1	General and Safety requirements for uninterruptible power systems (UPS)

Manufacturer/Importer

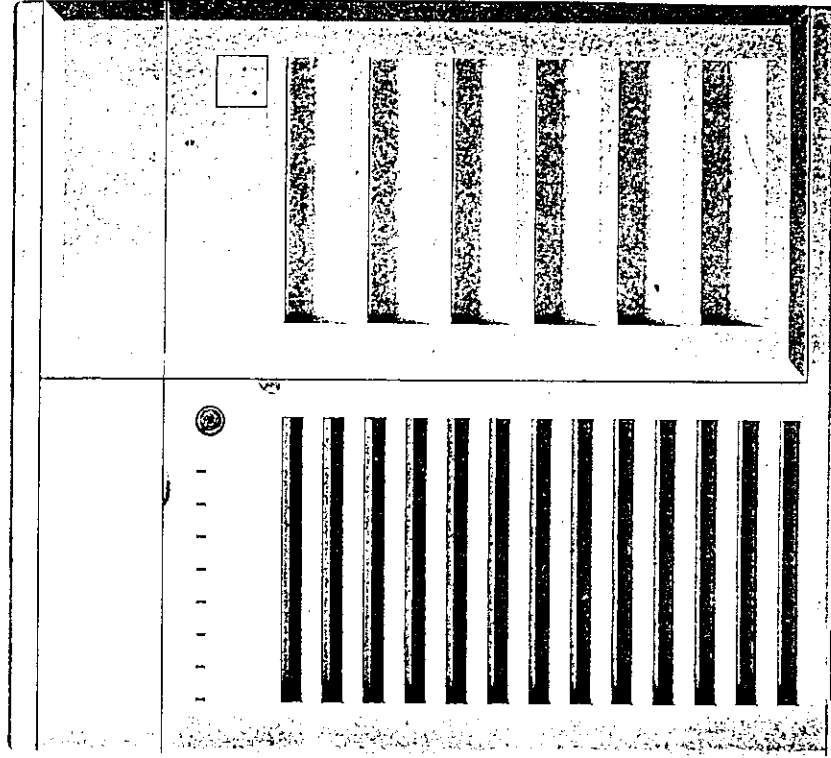
Signature R. L.
Name R. L.

Date : Dec. 06, 1997

(Stamp)



SERVER CASE A9881/A9891



THE BEST CHOICE FOR YOUR SERVER SYSTEM

USER'S MANUAL

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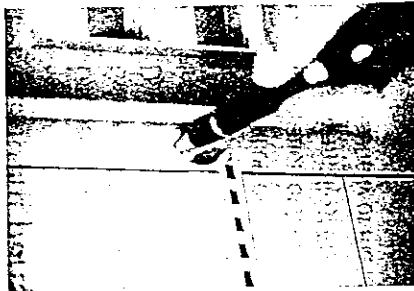
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1-6 The Mounting Position for Cooling Fan	19
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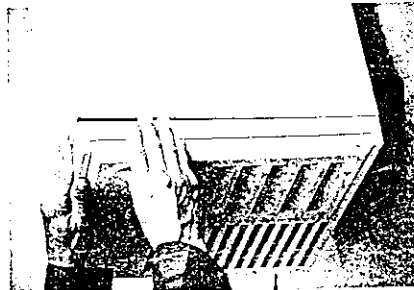
1-1 Standard Parts

A. Disassembly of Plastic Front Panel

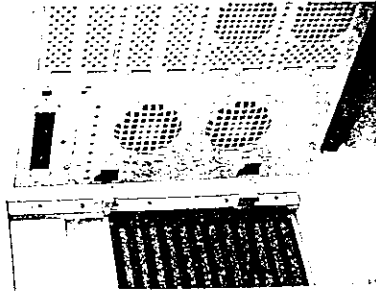
1. Turn the 3 way key lock 50° to unlock the left hand door, 180° to unlock the right hand door.
2. Open the right hand door and use a pen or screw driver to turn the hinge upward, so the main door is unlocked.



3. Pull the upper and bottom right corner of the main door to open it.



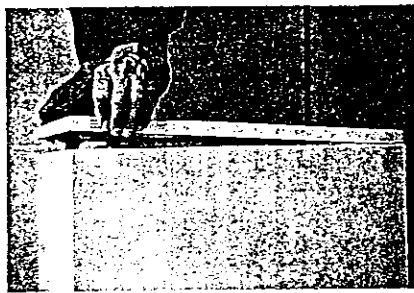
4. Lift up the main door to remove it.



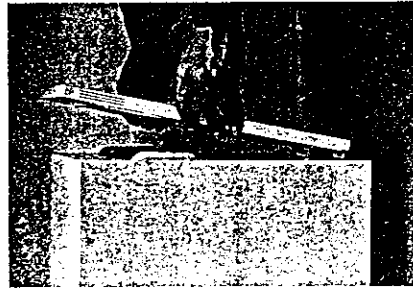
1

B. Disassembly of Plastic Rear Panel

1. Turn the key 90° to unlock the panel.
2. Pull the upper two corners of the panel to open it.



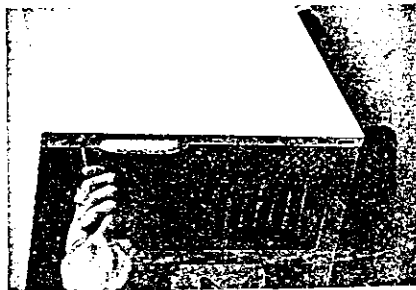
3. Lift up the panel to remove it.



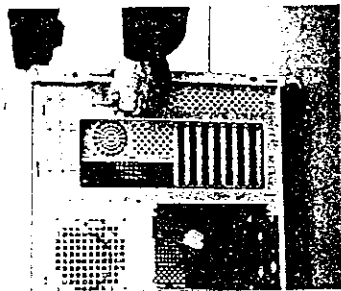
2

C. Disassembly of the Right and Left Side Doors

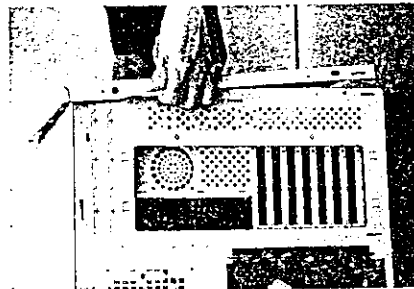
1. Loosen two screws.



2. Hold the handle and pull it backward.



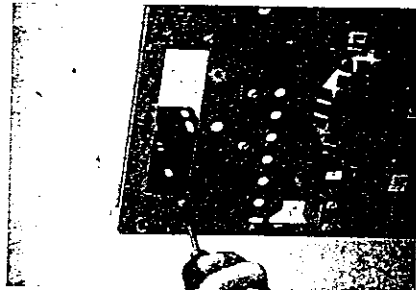
3. Pull the bottom of cover 10° and lift it up to remove it.



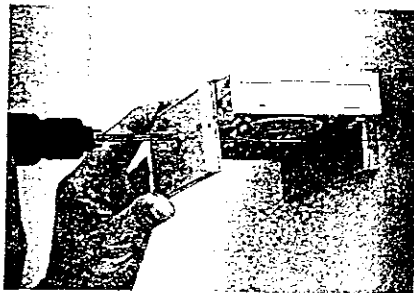
3

D. Installation of 3 1/2" FDD

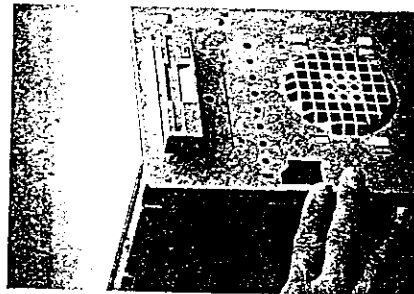
1. Loosen two screws to remove the FDD frame.



2. Mount 3 1/2" FDD onto the FDD frame.



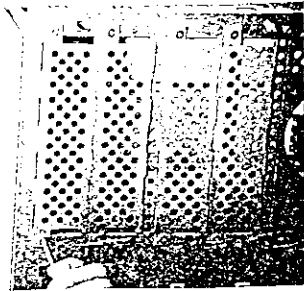
3. Slide the FDD frame into the chassis and tighten it with two screws.



4

E. Installation of 5 1/4" FDD/HDD

1. Loosen two screws to remove the metal shielding.



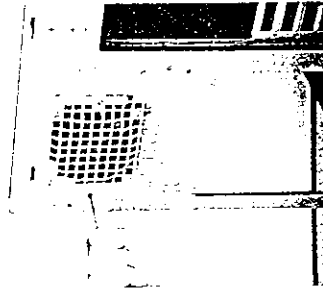
3. Slide 5 1/4" FDD/HDD into the chassis until it clicks.



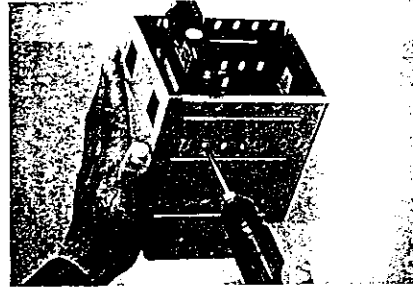
5

F. Installation of 3 1/2" HDD

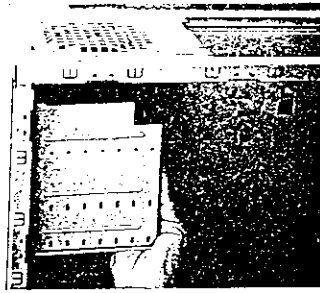
1. Loosen two screws.



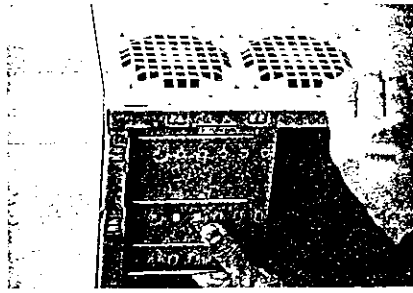
3. Mount 3 1/2" HDD onto the Cage.



2. Slide the drive cage toward the inner side of chassis to remove it.



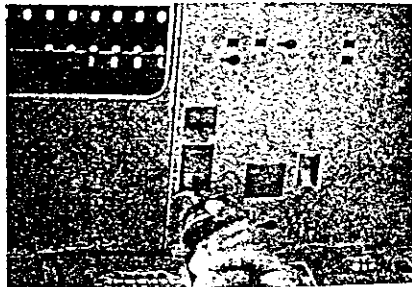
4. Slide the drive cage into the chassis and tighten it with two screws.



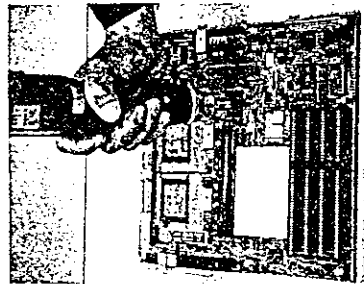
6

G. Installation of Motherboard

1. Loosen two screws to slide the M/B base toward the front chassis and remove it.

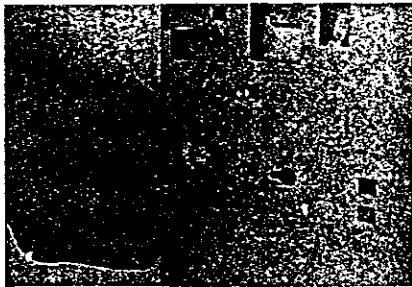


3. Mount the motherboard onto the M/B base.



4. You can also keep the M/B base in the original place and just lay down the chassis to install the motherboard onto the M/B base.

2. Insert the PCB standoff into the mounting position and push it downward until it clicks.

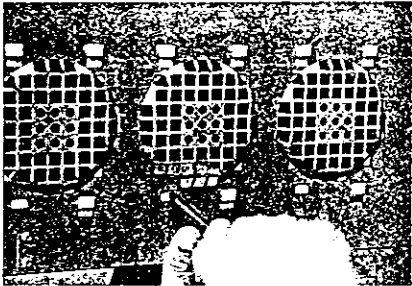


4. Slide the M/B base toward the slot bracket and tighten it with two screws.

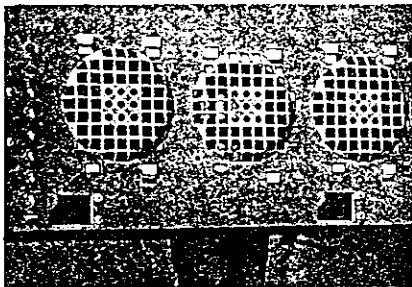


H. Disassembly of Fan Holder and Fan in the Front of Chassis

1. Push one hook with a screw driver to release the fan holder.



2. Slide the fan holder toward the outside of chassis and remove it.

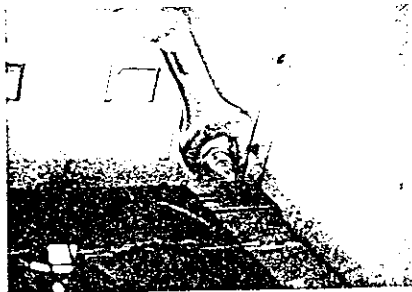


3. Push two soft hooks around the edge to release the fan.



I. Disassembly of Plastic Top Cover

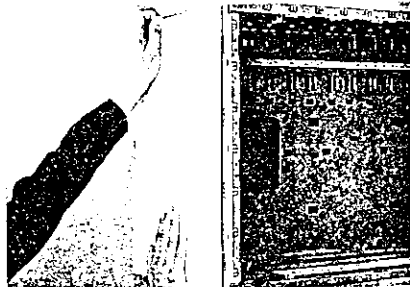
1. Use a wrench to release the screw nut of key lock.



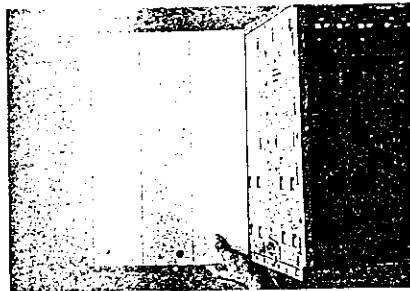
2. Remove the key lock.



3. Slide the top cover toward the back side.

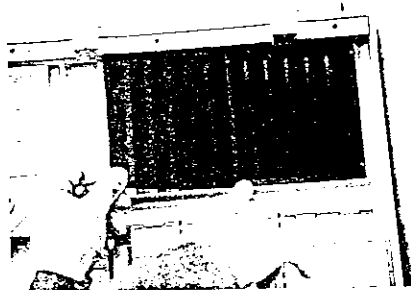


4. Remove the top cover.

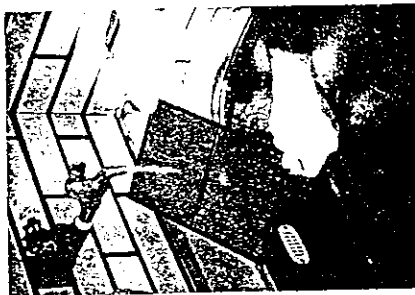


J. Clean the Fan Filter

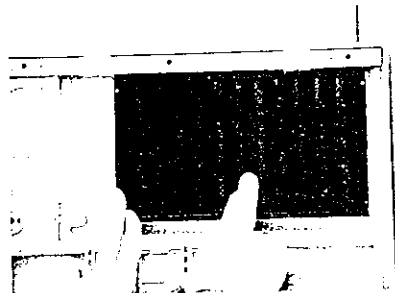
1. Remove the fan filter from the back of plastic front panel.



2. Clean the fan filter.



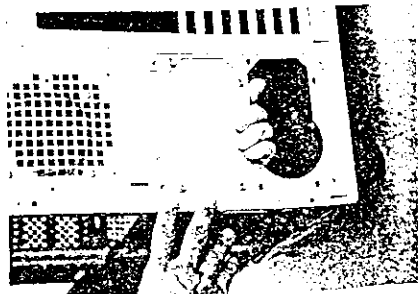
3. Attach the fan filter on the front panel.



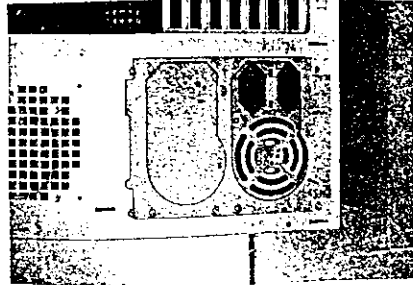
1-2 Optional Parts

A. Installation of the Power Supply Back Plate

1. Attach the back plate from the inner side of chassis.



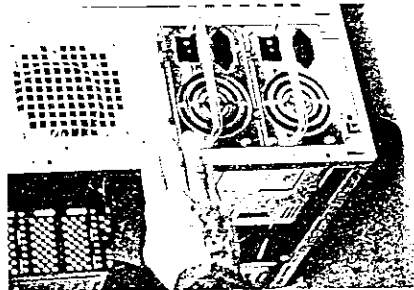
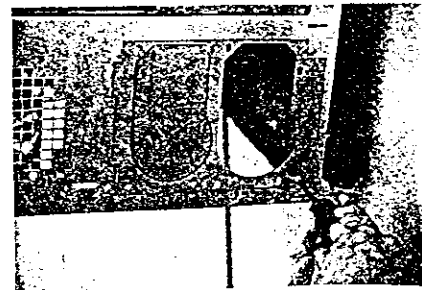
3. Available for one or two units PS/2 type power supply.



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*Installation of Redundant Power Supply

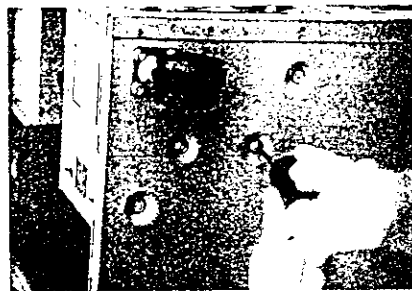
1. Place the power supply into the case.
2. Tighten the back of power supply with four screws.



3. Lay down the chassis.



4. Tighten the bottom of power supply with two screws.



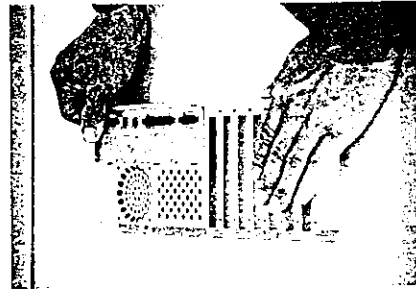
12

B. Change the Slot Bracket

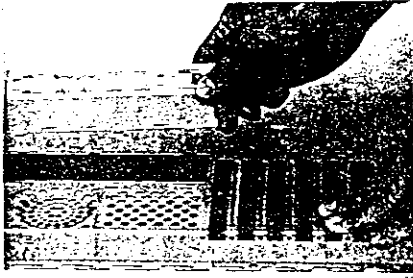
1. Loosen two screws and pull the slot bracket outward to remove it.



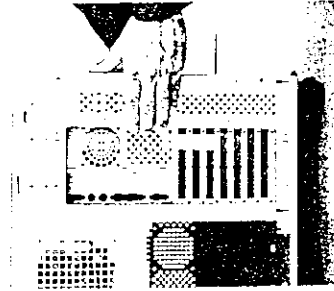
3. Insert the I/O shield into the slot and push it upward until it clicks.



2. Select the I/O shield you need.



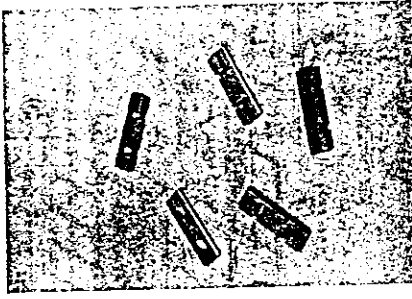
4. Slide the slot bracket toward the M/B base and tighten it with two screws.



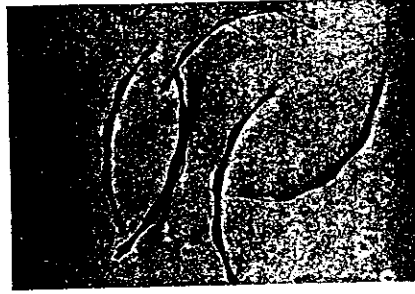
13

C. Assembly of EMI Clips

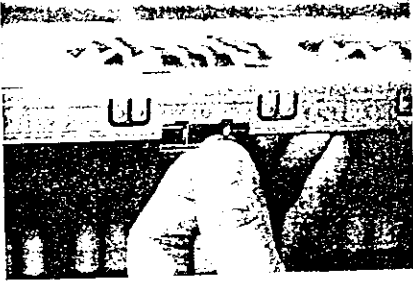
1. Take the EMI clips.



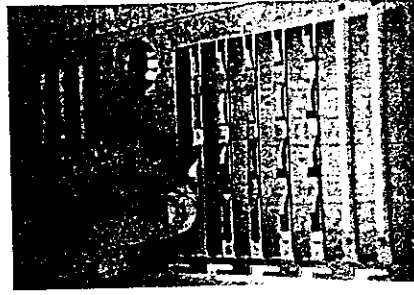
3. Take the slot conductive springs.



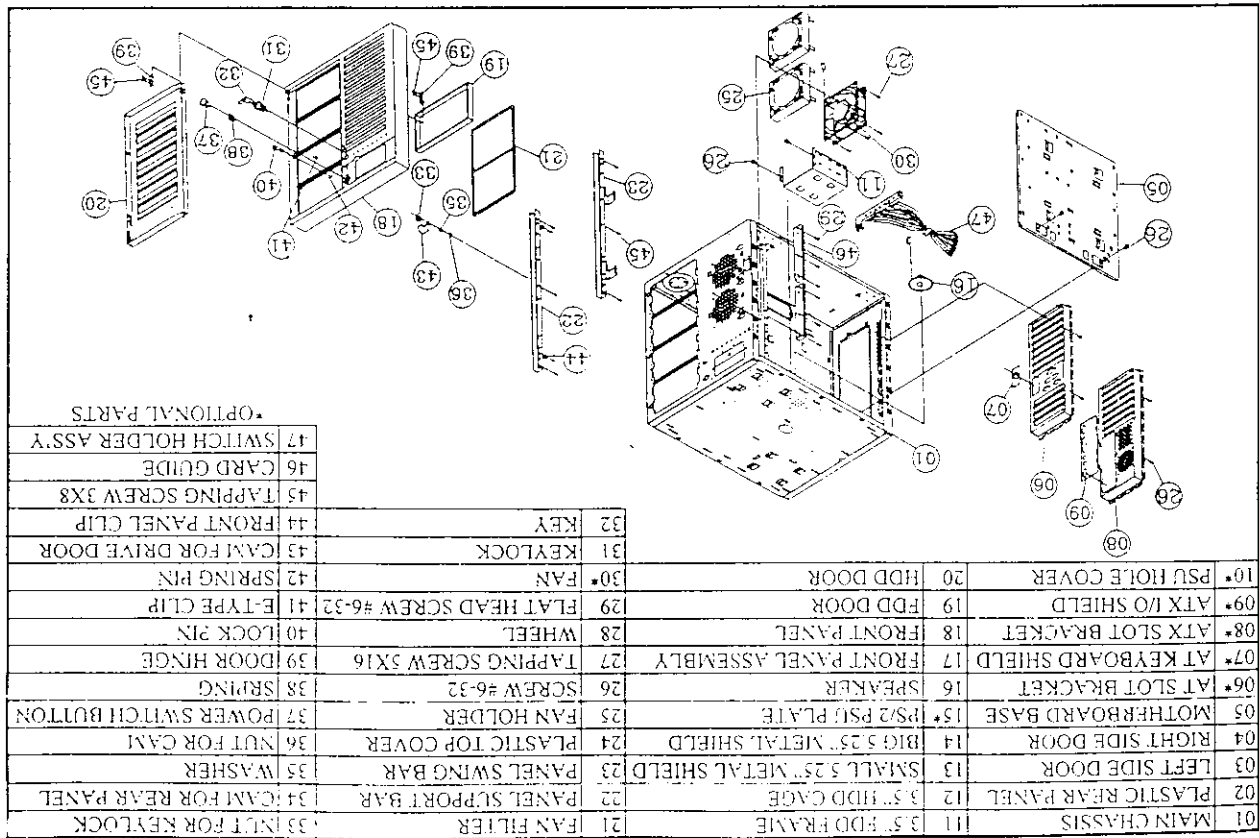
2. Clip the EMI clip on the edge of main chassis.



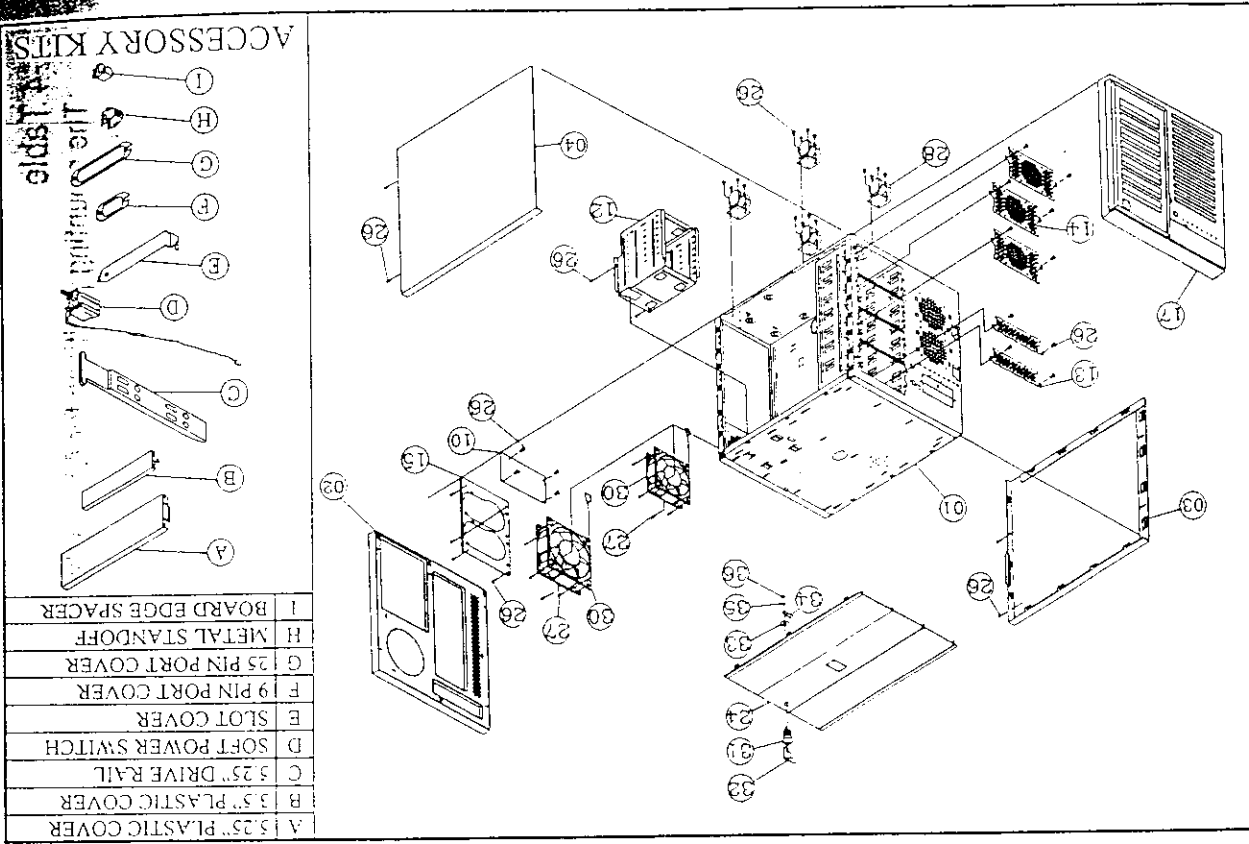
4. Clip the slot conductive spring on the slot bracket.



14



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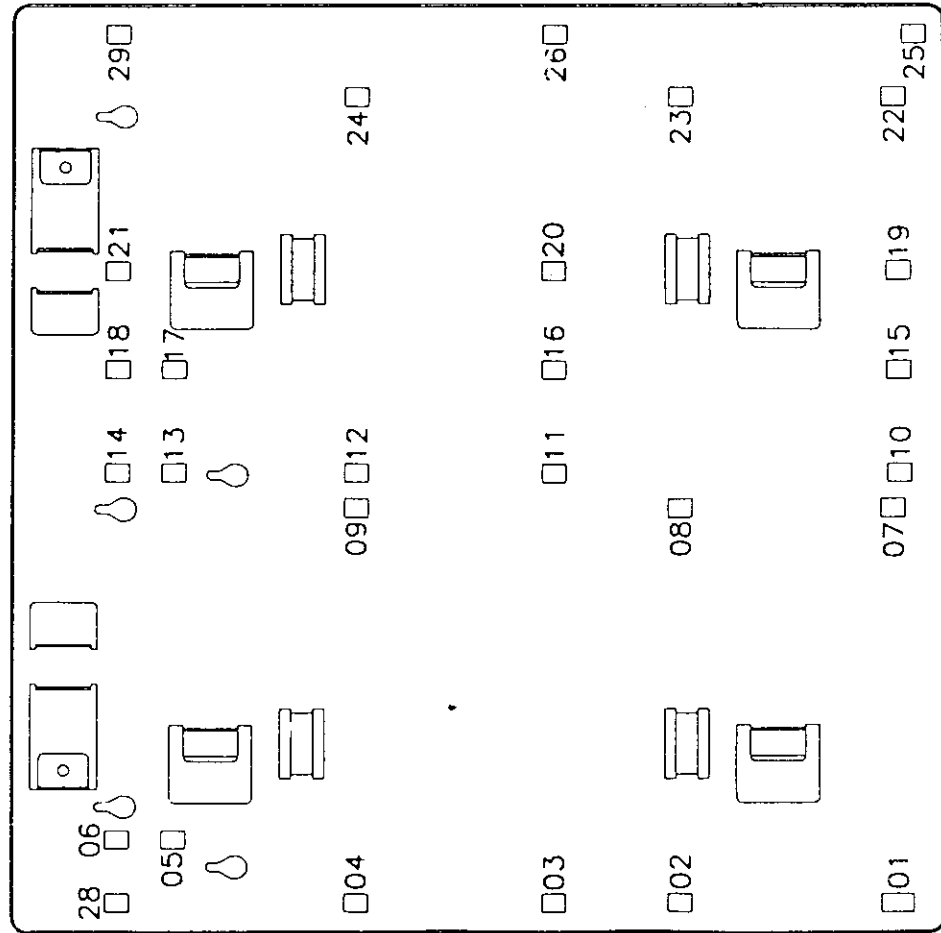


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1-4 Table

The mounting positions for ATX, Baby AT and Full AT M/B

Full AT : 01,02,03,04,09,10,11,24,25,26,28,29
 Baby AT : 01,02,03,04,08,09,10,11,23,24,25,26
 ATX : 01,02,03,06,10,11,14,19,20,21
 Mini ATX : 01,02,03,05,10,11,13,15,16,17



1-5 Part No.

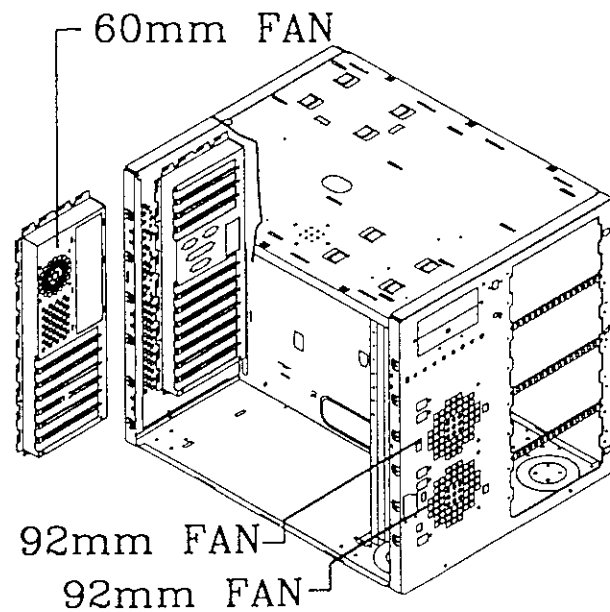
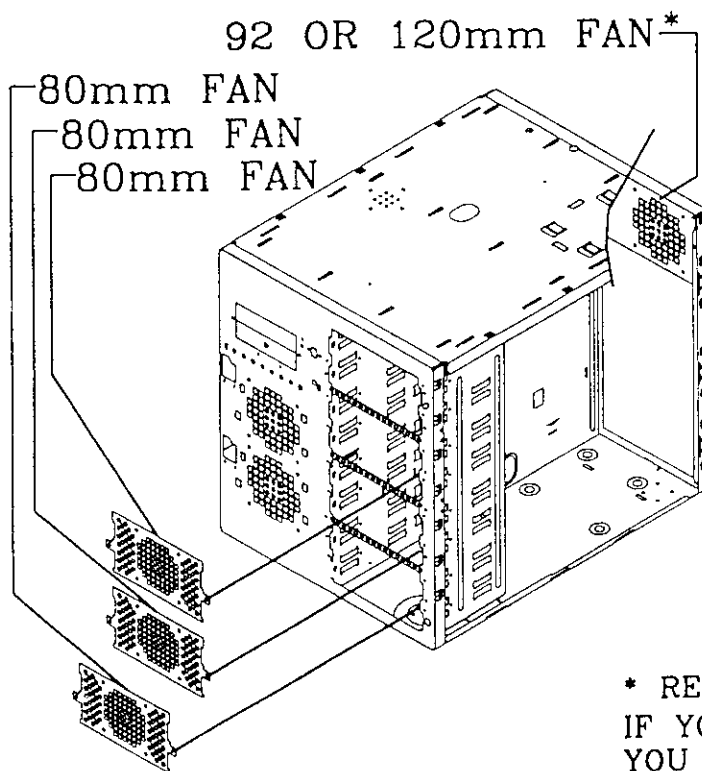
Thank you for the purchase of the server case. This case has some changeable parts for your choice. For certain configuration, we use different model no. as below.

Model no	Module in each case	
	Slot bracket	Power supply back plate
A9881-307	AT(11 slots)	PS/2
A9891-307	ATX/AT(7 slots)	PS/2
A9881R307	AT (11 slots)	Redundant
A9891R307	ATX/AT(7 slots)	Redundant

- We offer different type of ATX I/O shield. Please check it with vendor.

Each box your received should consist of the followings :

- (1) Complete case x 1
(including one kind of slot bracket, and power supply back plate)
- (2) Accessory kits pack x 1
- (3) Key x 1
- (4) User's manual x 1



* REMARKS:

IF YOU INSTALL A 120mm FAN,
YOU CAN'T INSTALL THE 3.5" HDD BRACKET.

MultiMedia VGA S3 Trio64V+ VGA

PCI-Bus MultiMedia VGA Controller

User's Manual

Version 3.5

09/97

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All other brand and product names are trademarks or registered trademarks of their respective companies.



FCC Notice:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference.
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Notice:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- . Reorient or relocate the receiving antenna.
- . Increase the separation between the equipment and receiver.
- . Plug the computer into a different outlet so that the two devices are on different branch circuits.
- . If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

Warning:

Shielded interface cables must be used in order to comply with emission limits.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CSA Notice:

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

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CHAPTER 1 : Quick Installation

This Quick installation is for experienced users only ! Other readers should take the time to read the manual .



CAUTION

- If you received CD "MultiWare" with your VGA card ,you can :
Insert the CD disc into CD-ROM. At the DOS command prompt. Typing D:\CDSETUP
 - If you receive a diskette with the VGA card ,please use A:\ SETUP(or B:\ SETUP)
 - If you have any install question, please check the README file in D:\CONTENTS.TXT (or A:\RELEASE.TXT from diskette).
-

Hardware Installation

1. Check that your monitor and system work fine .
2. Power off your PC and other cards in the system.
3. Put the VGA card into PCI slot and connect the power cable.
4. Ensure that all cables are properly connected, and that all plugs are firmly seated in their sockets.
5. Turn on the PC.

DOS Utilities and CAD/CAM Drivers

- Run the diskette-based SETUP or CD-based CDSETUP program from the DOS command prompt, or under Windows from the Program or File Manager.

Windows 3.1,3.11 and Windows for Workgroups

- Use the Windows Setup program to switch to a standard VGA display driver.
- Run the diskette-based SETUP or CD-based CDSETUP program from the Windows Program or File Manager.

Chapter 1 Quick Installation

- ☞ If you install with CD disc. The “**VGA Setup for Windows**” dialog box will appear.
You can select software driver you wish to install from VGA Setup for Windows dialog box. (Figure 4.2.3)
Install the Windows drivers, please click on the “**Microsoft Windows Drivers and Utilities**” button. And install the Windows 3.1 drivers, please select “**Microsoft Windows 3.1, 3.11 , Workgroups**”. Install the Windows 95 drivers, please select “ **Microsoft Windows 95**”
- ☞ If you install with diskette. The screen will appear “**Setup for Windows**” dialog box.
Install the Windows 3.1 drivers, please click on the “**Microsoft Windows 3.1, 3.11, Workgroups**” button. Install the Windows 95 drivers , please click on the “**Microsoft Windows 95**”

Windows 95

- If Windows 95's Plug and Play device manager prompts you to select a driver , enter the full path name to the driver distribution diskette (e.g., A:\) or CD directory(e.g., D:\WIN_S3 - refer to the CONTENTS.TXT file on the CD for the location of the new drivers). After Windows 95 restarts, run the diskette-base SETUP or CD-based CDSETUP program from the Windows Explorer to install the supplied utilities.
- If Windows 95 starts normally, run the diskette-based SETUP or CD-based CDSETUP program from the Windows Explorer to install the supplied utilities and then proceed to install the updated drivers by changing your display type.

Windows NT 3.51 and 4.0

- Select [VGA Mode]from the NT boot manager menu.
- Install the updated drivers by changing your display type using the NT Display control panel .For CD-based installations, refer to the CONTENTS.TXT file on the CD for the location of the new drivers. For diskette-based installation, NT drivers are located in the diskette root directory(e.g., A:\ or B:\).

Note : For more information, please refer to Chapter 4.

Chapter 1 Quick Installation

In Windows 95 environment, please notice below information.....

1. Any changes to font size require that Windows be restarted (this is why the QuickKeys module ignores Preset font size information).
2. Although all running Windows applications are notified of a change in display settings, different applications respond in different ways to these changes; program icons, in particular, (even Display Power Tools icons!) sometimes fail to be accurately repainted as a result of a change in color depth.

----- Suggest ! -----

Applications themselves do not need to be closed and reopened in response to a change in color depth, but recommended that you close and then reopen any color-sensitive files you may be working with, prior to and after a change in color depth; this is especially important if you are working with multimedia files or bitmapped images.

Question Support

If occur unlikely problems. Please follow below step

1. Check the README file in D:\CONTENTS.TXT (or A:\RELEASE.TXT form diskette.)
2. Try follow below step
 - » Ensure that all cables are properly connected, and that all plugs are firmly seated in their sockets. Check to see if the VGA card is firmly seated in its bus expansion slot.
 - » Ensure that the display monitor is properly connected to computer.
 - » Power OFF the computer system and all other connected devices.
 - » Ensure that the jumpers on the VGA board are set properly and safely.
3. If the question still appear, please read Chapter 6 : Getting Help

[Remark]

CONTENTS.TXT ⇄ Note for CD-ROM Based Installation.

RELEASE.TXT ⇄ Note for Diskette Based Installation.

CHAPTER 2 : Introduction

Congratulations on the purchase of your VGA board! You are now the owner of a state-of-the-art video adapter that offers features and functionality equal to, and beyond any other in the VGA class.

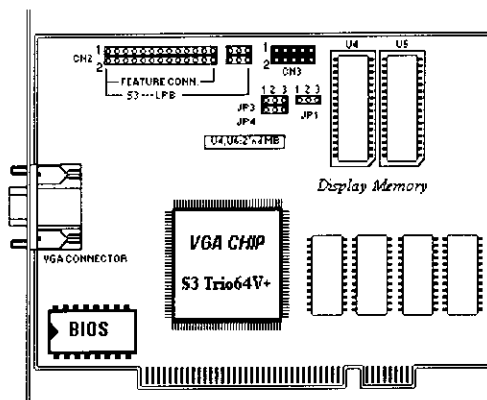
2.1 Features

Powered by S3 Trio64V+ , the MultiMedia VGA card combines high-performance graphics and full-motion video playback including MPEG-1. It Provides a boost in system performance for general Windows and DOS applications,as well as graphics intensive desktop publishing ,CAD and digital video software application.

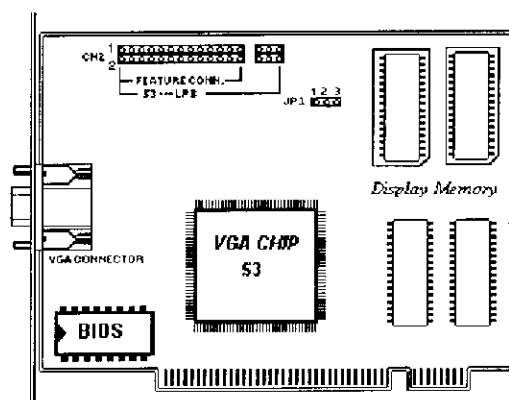
VGA Adapter features include:

- ☞ S3 Trio64V+ 64 bits DRAM based Graphics Accelerator VGA Chip.
- ☞ Support Multimedia accelerator.
- ☞ Fully IBM VGA compatible.
- ☞ Display up to 1600x1200 resolution.
- ☞ PCI-BUS V2.0 compliance.
- ☞ Up to 85Hz Vertical Scan Refresh Rate.
- ☞ Display up to 64K/16.7M colors.
- ☞ Supports 1M, 2M or 4M Byte Display Memory.
- ☞ Supports 64x64x2 sprite for use as hardware cursor.
- ☞ Supports 132 column extended text modes.
- ☞ Supports popular Software driver.
- ☞ BIOS support VESA Standard Extended VGA Mode.
- ☞ BIOS support VBE/PM function, VESA DPMS compatible.
- ☞ Supports Software MPEG.
- ☞ Provides S3 LPB for TV tuner, H/W MPEG function upgradable.

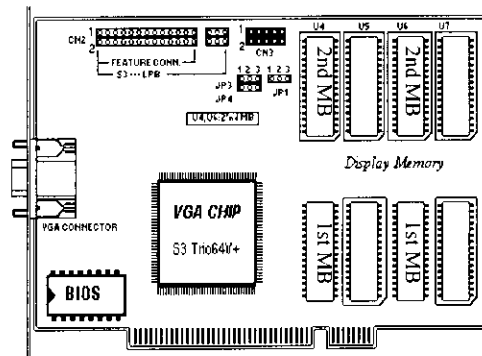
2.2 Layout



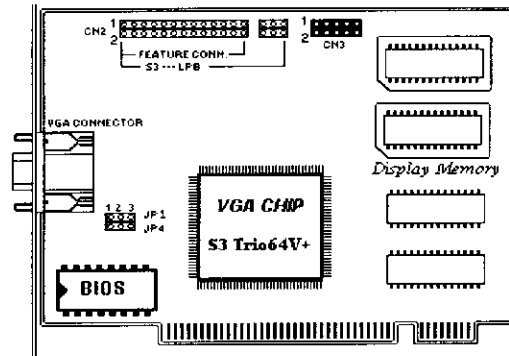
PCI Bus Connector



PCI Bus Connector



PCI Bus Connector



PCI Bus Connector



CAUTION

If you want to upgrade the DRAM size from 1MB to 2MB on S3 Trio64V+ VGA card , please insert the DRAM chips on socket U4 · U6.

VGA Chip

S3 Trio64V+ VGA Chip

Video BIOS

This is the video Basic Input Output System. It is the software interface for Programmer to program the VGA card. It simplifies and unifies programming of the display card.

PCI Bus Connector

PCI expansion slot bus connector.

VGA Connector

15-pin connector for VGA monitor cable to plug in.

Feature Connector

S3 Local Peripheral Bus Connector. It is VESA standard Feature Connector.

Display Memory

The size of display memory on your VGA CARD determines the graphic resolutions and number of colors the card can support.



Model DFE-530TX
Ethernet / Fast Ethernet
Adapter for PCI Bus
User's Guide

Rev. 01 (February, 1998)

GDPE530TX.01

Printed in Taiwan



RECYCLABLE

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FCC Certifications

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded interface cables must be used in order to comply with emission limits.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Limited Warranty

Hardware:

D-Link warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from D-Link or its Authorized Reseller:

Product Type	Warranty Period
Network adapters	Lifetime
Unmanaged and managed hubs (10Mbps)	One year
Unmanaged and managed hubs (100Mbps)	One year
Repeaters, MAUs, transceivers, media converters	One year
Concentrators	One year
Interconnecting products	One year
• Power supply and fans in these devices	One year
Other hardware products	One year
Spare parts and spare kits	90 days

If a product does not operate as warranted during the applicable warranty period, D-Link shall, at its option and expense, (1) repair the defective product or part, (2) deliver to Customer an equivalent product or part to replace the defective item. All products that are replaced will become the property of D-Link. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

D-Link shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to D-Link pursuant to any warranty.

All products with lifetime warranty have a standard five-year warranty. To qualify for lifetime warranty, the enclosed Product Registration Card must be completed and returned to D-Link within ninety (90) days of purchase.

Warranty service may be obtained by contacting a D-Link office within the applicable warranty period for a Return Material Authorization (RMA) number. If a Registration Card has not been previously sent, proof of purchase, such as a copy of the dated purchase invoice, must be provided. Once an RMA number is issued, the defective product must be shipped back to D-Link prepaid, insured and wrapped in the original or similar shipping package to ensure that it will not be damaged during shipment. When returning the defective product to D-Link for service, the RMA number must be marked on the outside of the shipping package. Any product returned without an RMA number shall be rejected and sent back to the Customer, and D-Link reserves the right to have Customer bear the cost of sending back such products. A service charge may or may not be levied to Customer by D-Link. To find out if a service charge is levied or not, and the charged amount, read the RMA that is returned to Customer, or ask the D-Link office when an RMA is requested.

Software:

Warranty service for software products may be obtained by contacting a D-Link office within the applicable warranty period. A list of D-Link offices is provided at the back of this manual, together with a copy of the Registration Card. If a Registration Card for the product in question has not been returned to a D-Link office, then a proof of purchase (such as a copy of the dated purchase invoice) must be provided when requesting warranty service. The term "purchase" in this software warranty refers to the purchase transaction and resulting licence to use such software.

D-Link warrants that its software products will perform in substantial conformance with the applicable product documentation provided by D-Link with such software product, for a period of ninety (90) days from the date of purchase from D-Link or its Authorized Reseller. D-Link warrants the magnetic media, on which D-Link provides its software product, against failure during the same warranty period. This warranty applies to purchased software, and to replacement software provided by D-Link pursuant to this warranty, but shall not apply to any update or replacement which may be provided for download via the Internet, or to any update which may otherwise be provided free of charge.

D-Link's sole obligation under this software warranty shall be to replace any defective software product with product which substantially conforms to D-Link's applicable product documentation. Purchaser assumes responsibility for the selection of appropriate application and system/platform software and associated reference materials. D-Link makes no warranty that its software products will work in combination with any hardware, or any application or system/platform software product provided by any third party, excepting only such products as are expressly represented, in D-Link's applicable product documentation as being compatible. D-Link's obligation under this warranty shall be a reasonable effort to provide compatibility, but D-Link shall have no obligation to provide compatibility when there is fault in the third-party hardware or software. D-Link makes no warranty that operation of its software products will be uninterrupted or absolutely error-free, and no warranty that all defects in the software product, within or without the scope of D-Link's applicable product documentation, will be corrected.

D-Link Offices for Registration and Warranty Service

The product's Registration Card, provided at the back of this manual, must be sent to a D-Link office. To obtain an RMA number for warranty service as to a hardware product, or to obtain warranty service as to a software product, contact the D-Link office nearest you. An addresses/telephone/fax list of D-Link offices is provided in the back of this manual.

LIMITATION OF WARRANTIES

IF THE D-LINK PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, THE CUSTOMER'S SOLE REMEDY SHALL BE, AT D-LINK'S OPTION, REPAIR OR REPLACEMENT. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. D-LINK NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF D-LINK'S PRODUCTS.

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IN NO EVENT WILL D-LINK BE LIABLE FOR ANY DAMAGES, INCLUDING LOSS OF DATA, LOSS OF PROFITS, COST OF COVER OR OTHER INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES ARISING OUT OF THE INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE OR INTERRUPTION OF A D-LINK PRODUCT, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY. THIS LIMITATION WILL APPLY EVEN IF D-LINK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

IF YOU PURCHASED A D-LINK PRODUCT IN THE UNITED STATES, SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

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1

Introduction

Thank you for choosing D-Link DFE-530TX, the value leader among Fast Ethernet adapters for PCI-Bus personal computers. This Introduction chapter will be useful if you are new to Fast Ethernet and other new technology featured by the DFE-530TX. Otherwise, skip ahead to the Installation chapter.

About Fast Ethernet

Fast Ethernet is a network technology specified by IEEE Standard 802.3u. It extends the traditional 10Mbps Ethernet technology to achieve 100Mbps transmission and reception, while retaining the same CSMA/CA Ethernet protocol. Thus while Fast Ethernet provides a tenfold increase in network capacity, it is wholly compatible with traditional 10Mbps Ethernet network facilities. This compatibility is the key to easy and efficient upgrades to 100Mbps in your network areas needing greater bandwidth. Upgrading selected areas to Fast Ethernet does not require hardware or software changes in network areas where traditional 10Mbps Ethernet is providing good service. For upgrading existing Ethernet installations to 100Mbps, and especially for selectively upgrading areas needing upgrade, Fast Ethernet is the clear choice in terms of cost-effectiveness, as well as convenience and smoothness in transition.

Fast Ethernet comprises two subtypes: 100Base-T4 and 100Base-TX. 100Base-T4 Fast Ethernet can utilize existing Category 3 or Category 4 UTP network cabling, but does not provide for full duplex operation. 100Base-TX requires Category 5 cabling, but does provide full duplex operation. Full duplex 100Base-TX operation allows simultaneous transmission and reception, both at 100Mbps, thus providing service potentially equal to 200Mbps half-duplex service.

The DFE-530TX Adapter does not support the 100Base-T4 subtype. To provide compatibility in traditional 10Mbps Ethernet environments (where, for example, DFE-530TX adapters are installed *anticipating* upgrade of supporting hub equipment to Fast Ethernet), the DFE-530TX also supports traditional 10Mbps Ethernet operation, in full-duplex as well as half-duplex modes. Selection of the best operation mode in any given installation is automatically governed by auto-negotiation.

About Auto-negotiation

You have probably had the experience of making a dialup connection through a modem, and have heard the gravelly-sounding exchanges between your modem and the modem at the other end of the telephone line (these exchanges are ordinarily played out through a speaker in your local modem). As irritating as those few seconds of noise may be, they do let you know that your modem and the remote modem are on the job, preparing for your intended communication with the remote computer.

The preparatory work of the two modems during those few seconds before you see the "connect" message is to *negotiate*

the best data communication scheme which is supported by both modems, and which is suitable for the quality of the telephone line linkage between them. The parameters to be settled between the two modems include best baud rate, compression method, and error correction method. When the two modems have tested the phone-line quality and settled on the combination of shared options and parameters which will provide the best data communication over the connecting phone line, then you are given the "connect" message which signals the end of the intermodem negotiation and the beginning of your intended communication with the remote computer.

Auto-negotiation between devices within an Ethernet LAN is similar in concept, but much briefer. The two devices involved in the auto-negotiation will be the DFE-530TX Adapter serving your station (*installed in your computer*), and the hub through which it is connected into the LAN. The options to be negotiated between the DFE-530TX and its supporting hub include Ethernet type (100BASE-TX Fast Ethernet or 10BASE-T Ethernet) and duplex mode (half-duplex, being one-way-at-a-time, or full duplex, being simultaneous transmit-and-receive).

Startup communication between the two devices occurs when both devices are power-on, the cable connection between them is good, and the Network Operating System software is running. As soon as those conditions are satisfied, the preparatory process of auto-negotiation between the DFE-530TX and its supporting hub proceeds automatically. If the hub has auto-negotiation functionality, then it and the DFE-530TX exchange a series of messages in which each device signals its capabilities and listens for corresponding information about the other. The auto-negotiation process requires only a few milliseconds,

and the two devices select the best communication parameters supported by both devices.

If the hub does not have auto-negotiation functionality, then its monotone (single capability) message will be recognized by the DFE-530TX's auto-negotiation facility, and the DFE-530TX will simply switch to the one of its own capabilities which matches that of the hub.

When the preparatory procedure of auto-negotiation is completed, then the line is ready and will provide a data channel which is optimal for the two devices. The line will remain ready without further auto-negotiation action until the linkage is broken. Auto-negotiation then reoccurs at any time that the linkage is restored, again making the line ready for optimal data communications.

About PCI Bus

Your DFE-530TX Adapter delivers outstanding performance by fully exploiting the advanced features of your computer's PCI bus. DFE-530TX Adapters utilize the Bus Master Mode of the PCI bus, allowing direct transfers of Ethernet packet content between computer memory and the adapter's controller, thus minimizing network demand on the CPU. The adapter's controller function provides the additional benefit of reduced command processing overhead.

The working relationship between a DFE-530TX adapter and main memory working in Bus Master mode is powered by the Bridge/Memory Controller of the PCI bus. This reduces the CPU role in network operations, thus freeing the CPU to service other tasks, with resulting improvement

in overall computing (multitasking) performance. At the same time, it produces superior network throughput by reducing latency (waiting for CPU service) during transmissions and receptions.

Features

Designed for versatility and performance, the DFE-530TX Adapter provides the following features:

- Operates in a PCI Bus Master slot of a Pentium/486 computer, independent of CPU speed.
- PCI Bus Master memory access, for high throughput and low CPU demand.
- 32-bit Intelligent Ethernet controller.
- Complies with IEEE 802.3 100Base-TX and 10Base-T Ethernet standards.
- Plug and Play installation.
- RJ-45 connector for network cable connection.
- 100Mbps Fast Ethernet or 10Mbps Ethernet data transfer, selected via auto-negotiation.
- Full duplex or half-duplex operation, selected by auto-negotiation.
- Built-in FIFO buffers reduce overhead of memory transfers.
- Three LED indicators: 10Mbps/100Mbps, Link, Activity.

- Drivers† for all leading Network Operating Systems.

2

Installation

Installation of a DFE-530TX Ethernet Adapter requires hardware installation first, then software installation.

Unpack and Inspect

CAUTION: Under ordinary circumstances, a DFE-530TX card will not be affected by static charge as may be received through your body during handling of the unit. In special circumstances where you may carry an extraordinarily high static charge, it is good practice to reduce the charge by touching a ground before handling the adapter card.

Open the shipping carton and carefully remove all items. In addition to this User's Guide, ascertain that you have:

- One DFE-530TX Ethernet Adapter Card.
- DFE-530TX Software Diskette.

† Check <http://www.dlink.com> for newest release of drivers.

Install the Adapter

1. Shut down the computer, unplug its power cord, and remove the chassis cover.

2. If your order does not include the Boot ROM option, go ahead to Step 3. If your order includes the Boot ROM option, then install the Boot ROM Chip by plugging the chip into the Boot ROM Socket on the DFE-530TX card. The notched end of the Boot ROM Chip must be aligned with the notched end of the Boot ROM Socket (opposite alignment will cause destruction of the Boot ROM Chip).
3. Insert the contact edge of the DFE-530TX card into the connector of any available PCI Bus Master expansion slot. Press the card firmly into the connector and ascertain that the card's contacts are fully seated in the connector.
4. Install the bracket screw which secures the card to the computer chassis.
5. Replace the computer's chassis cover.
6. Reconnect the computer's power cord, and switch computer power on. If the BIOS section of your computer's boot program is Plug and Play compliant, then at power-up the BIOS will automatically configure any newly installed DFE-530TX adapter.

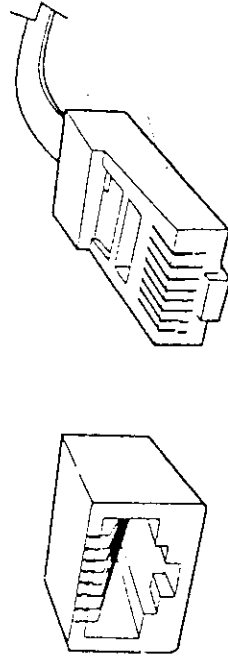
NOTE: Due to a fault in some Plug-n-Play BIOS programs, it happens occasionally that a newly installed adapter is assigned an Interrupt Number which is already assigned to another device. In such a case, the conflict of Interrupt Number will cause faults in the behavior of both devices. Then it is necessary to run the CMOS Setup utility, and manually assign a non-conflicting Interrupt Number.

Connect the Network Cable

Category 5 UTP cable qualifies for both, the Fast Ethernet and Ethernet, cabling rules. The maximum length of any single cable run between any station and its supporting hub is 100 meters. The maximum length of a cable joining two hubs is 10m in general, but is 100m when both hubs qualify as Ethernet Class 2 Repeaters (*all* D-Link Ethernet hubs do qualify). However, these cable runs may need to be shorter than the given individual maximum lengths, because their lengths are globally restricted by the rule that the maximum *aggregated* cable run between any two stations is 205m.

Connecting for Fast Ethernet (100Mbps)

Category 5 UTP cable is required for Fast Ethernet operation. The maximum cable run between the DFE-530TX and the supporting hub is 100m. The cable must be *straight* (not a crossover cable), with an RJ-45 plug at each end. Make the network connection by plugging one end of the cable into the RJ-45 jack of the DFE-530TX, and the other end into a port of the supporting hub.



Connecting for 10Mbps Ethernet

Category 3, Category 4, and Category 5 UTP cable, as well as EIA/TIA-568 100-ohm STP cable, all qualify under Ethernet cabling rules. The maximum cable run between the DFE-530TX and the supporting hub is 100 meters. The cable must be *straight* (not a *crossover* cable) with RJ-45 connector at each end. Make the network connection by plugging one end of the cable into the RJ-45 jack of the DFE-530TX, and the other end into a port of the supporting hub.

Software Installation

On account of the great variety of network environments for which the DFE-530TX may be used, and revisions of those network systems, the instructions for software installation are given as README files on the DFE-530TX Software Diskette. Review the root directory README for overview information, and for full installation details, see the README and referenced instruction files in the sub-directory appropriate to your network operating system.

A

Troubleshooting

If you experience any problems with the adapter, first verify that the appropriate driver is loaded, that the proper grade of cable is employed for the network connection, and that the supporting hub is functioning properly.

1. Ascertain that the adapter card is fully and firmly seated in the slot connector.
2. Check the length and rating of connecting cables.
3. Ascertain that the adapter's PCI slot is not deactivated at the BIOS level. The CMOS Setup utility in PCI computers ordinarily provides the option to activate or deactivate PCI slots.
4. Replace the adapter in question with a verified adapter and run the diagnostic test again.
5. Install the questioned adapter in another PCI computer and run the tests again.
6. Remove all other PCI adapters from the computer and run the tests again. If the verification/diagnostic run is then normal, then there is probably an interrupt number conflict which will have to be resolved manually by a CMOS Setup utility run after you have reinstalled all of the expansion cards.

The DFE-530TX Adapter features three LED indicators to assist in the resolving of network diagnostics:

- 10Mbps/100Mbps SPEED Indicator
This LED shows steady green (on) when 100Mbps speed is selected. It is dark (off) when 10Mbps is negotiated.
- LINK Indicator
Steady green indicates good linkage between the DFE-530TX and its supporting hub.
- ACTIVITY Indicator
Flashing green indicates that the adapter is sending or receiving.

B

Specifications

Network Type:

- Fast Ethernet 100Base-TX
IEEE 802.3u standard for 100Mbps baseband CSMA/CD local area network
- Ethernet 10BASE-T
IEEE 802.3 standard for 10Mbps baseband CSMA/CD local area network

Jumperless Hardware

Auto-negotiation functionality

Media interface: RJ-45

LAN Chip Set:

- Interface controller, D-Link DL10030
- Transceiver interface, Davicom DM9101

EMI Compatibility:

FCC Class B
VCCI Class B
CISPR B
SMA Certification
CE Certification, Class B

Host interface: PCI 2.1 Bus (Bus Master)

I/O & IRQ base address: assigned by Plug and Play system

Physical Dimensions: 13.9 cm x 7.3 cm

Environment:

Storage: -20° to 80°C, (-4° to 176° F)

Operating: 0° to 55° C, (32° to 131° F)

Humidity: 10% to 90% non-condensing

Power Consumption: 2W (400mA @ 5V) max

PCB Layer: 2 layers

Software drivers† for:

- ✓ Microsoft Windows 95, 98
- ✓ Microsoft Windows NT3.51, NT4.0
- ✓ Banyan VINES v4.00 (2)
- ✓ DECnet PathWorks v4.0
- ✓ FTP PC/TCP
- ✓ IBM Communication Manager v1.0
- ✓ IBM LAN Server v4.0, v3.0, v2.0
- ✓ IBM LAN Support Program v1.3x
- ✓ Microsoft LAN Manager v2.1
- ✓ Microsoft Windows for workgroups 3.11
- ✓ Novell Netware 3.x, 4.x ODI driver
- ✓ Win/TCP PathWay Access for DOS v1.1
- ✓ NDIS 2.x.3.x driver
- ✓ Packet Driver
- ✓ SCO Open Server 5.0.x
- ✓ SCO UNIX
- ✓ SUN PC-NFS

† Check <http://www.dlink.com> for drivers not listed and latest release of drivers.

D-Link Offices

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Web: www.dlink.net
FTP: <ftp://ftp.dlink.net>

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FAX: 49-6102-97111
BBS: 49-6102-971120
Info: 0130-7250-00 (toll free)
Help: 0130-7250-40 (toll free)
Web: www.dlink.de

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