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IPC Solution

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## **FX5600 Series Embedded Computers User's Manual**

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- ❑ Description of you peripheral attachments
- ❑ Description of your software (operating system, version, application software, etc.) and BIOS configuration
- ❑ Description of the symptoms (Extract wording any message)

For updated BIOS, drivers, manuals, or product information, please visit us at [www.fabiatech.com](http://www.fabiatech.com)

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## Chapter 1 Introducing the FX5600 System

### Overview

The FX5600 is an embedded system with Pentium III or VIA Eden CPU module inside. This user's manual provides information on the physical features, installation, and BIOS setup of the FX5600.

Built to unleash the total potential of the Pentium Processor, Able to support 667Mhz ~1.4GHz CPUs, this system supports 1 LAN, 2 USB ports, Audio, 64~512MB SDRAM, and an AGP-VGA controller.

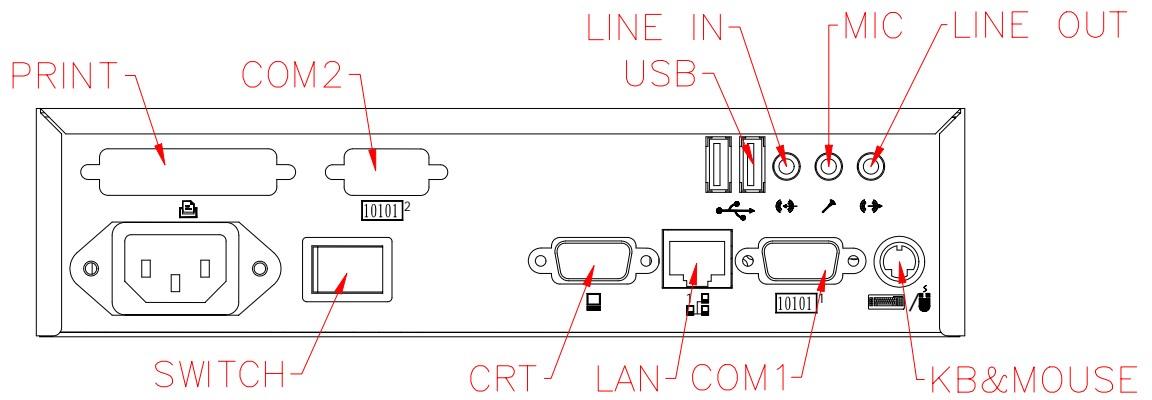
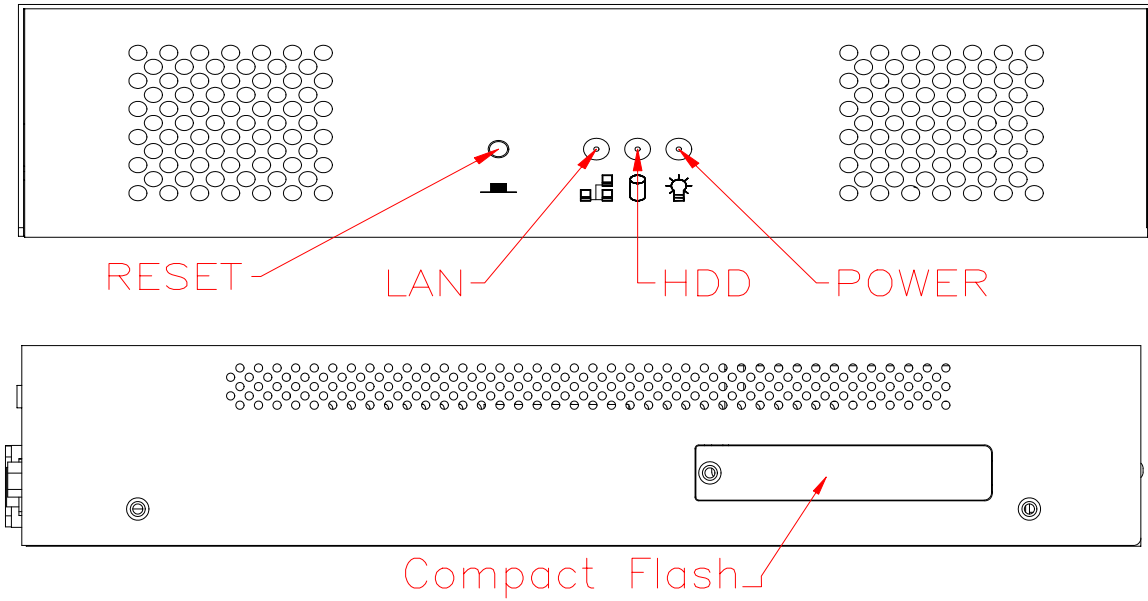
Each FX5600 has two ports for I/O communications. Two RS-232C ports are available.

The FX5600 is perfect for POS and POI applications, Internet Router, VPN Gateway, fire wall, Mail Server, WBT, Thin Client and small Embedded Control. The unit is only 301.2mm(D) X 220.0mm(W) X 54mm (H).

## Series Comparison Table

Model	FX5600A	FX5600B
Processor	INTEL PIII (Celeron)- 850MHz~1.4GHz	Low Power VIA-Eden-667Mhz
Chipset	Intel815E	VT-8606
1(So)-DIMM (Max. SDRAM)	512MB	576MB(On Board 64MB)
CRT VGA	Yes	Yes
Watchdog Timer	Yes	Yes
Multi I/O	One RS232 and One RS232/422/485 One Parallel	One RS232 and One RS232/422/485 One Parallel
Enhanced IDE or CF	One	One
USB	Two	Two
Audio	Line-In/Out	Line-In/Out
RJ45 LAN port (10/100Mbps)	One	One
Dimensions (Unit: mm)	301.2(D) x 220.0(W) X 54.0(H)	

## Layout





## Specifications

### ❑ *Processor Board –*

FX-5600A - 850MHz ~ 1GHz Intel Pentium III or Celeron CPU with SDRAM.

FX-5600B - 667Mhz VIA –Eden Low Power CPU with on board 64MB SDRAM.

### ❑ *I/O Outlets –*

One LAN 100/10 base-TX Ethernet port.

One parallel port with DB25 port.

One CRT and one PS/2 compatible keyboard and mouse interfaces.

Two USB ports.

One AC-In plug connector with power switch.

One Push bottom reset switch.

One power LED, One HDD/CF access LED and One status LED

### ❑ *Storage Bay-*

One Compact Flash slot with plug-in aperture and cover,

One 2.5" hard disk space with HDD holder.

### ❑ *Power requirement –*

AC 85~270V, 50~60Hz, 0.7A maximum.

### ❑ *Dimensions -*

301.2mm(D) x 220.0mm(W) x 54.0mm(H)

## Packing List

Upon receiving the package, verify the following things. Should any of the mentioned happens, contact us for immediate service.

- Unpack and inspect the FX5600 package for possible damage that may occur during the delivery process.
- Verify the accessories in the package according to the packing list and see if there is anything missing or incorrect package is included.
- If the cable(s) you use to install the FX5600 is not supplied from us, please make sure the specification of the cable(s) is compatible with the FX5600 system.

**Note:** after you install the FX5600, it is recommended that you keep the diskette or CD that contains drivers and document files, and keep the document copies, or unused cables in the carton for future use.

The following lists the accessories that may be included in your FX5600 package. Some accessories are optional items that are only shipped upon order.

- One FX5600 embedded system.
- One AC power code.
- One Y-type (3-terminal) PS/2 keyboard plus mouse port adapter cable. (Optional)
- One compact disc includes software utility.



## Chapter 2 Hardware Installation

This chapter introduces the system connectors & jumper settings, and guides you to apply them for field application.

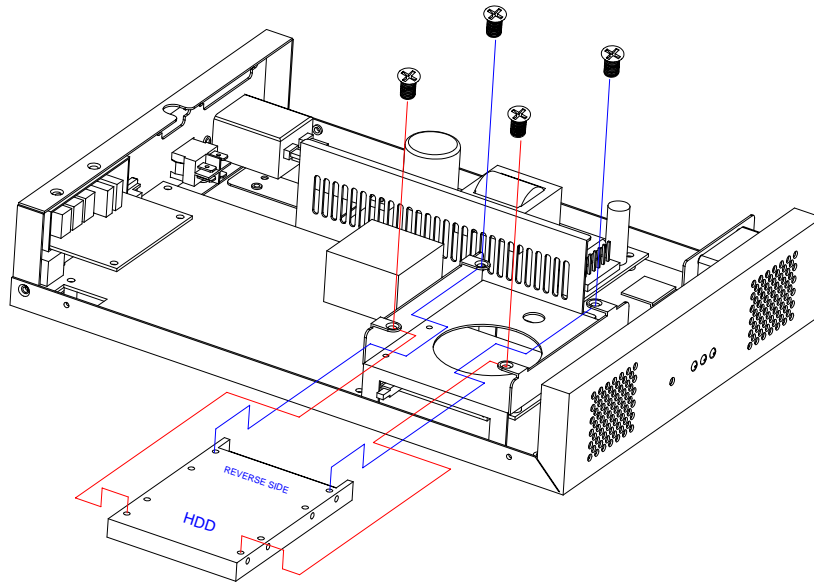
### Before Installation

Before you install the system, make sure you follow the following descriptions.

1. Before removing the cover, shut down the operation System and disconnect power switch to off and unplug AC cable.
2. Install or unplug any connector, Compact Flash, and hard disk be sure that the power is disconnected or power switch to off from the system. If not, this may damage the system.
3. The ESD (Electricity Static Discharge) may be created from human body that touches the board. It may do damage to the board circuit.

□ **Removing Covers -Installing HDD**

If you are installing hardware option, you can remove the top cover. The following figure will guide you how to install 2.5" HDD inside the FX5600 and how to install the FX5600 fixers.

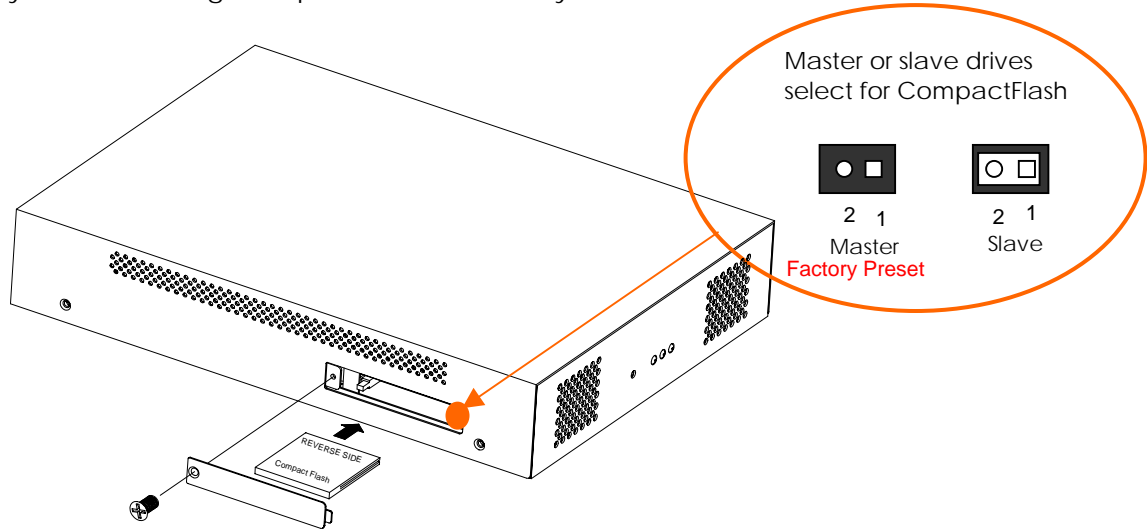


**Note:** Use caution when handling the hard disk to prevent damage to IDE connector as you insert hard disk.

Be careful with the pin orientation when installing connectors and the cables. A wrong connection can easily destroy your hard disk.

□ **Installing Compact Flash**

If you are installing Compact Flash modules you need to remove a side cover.

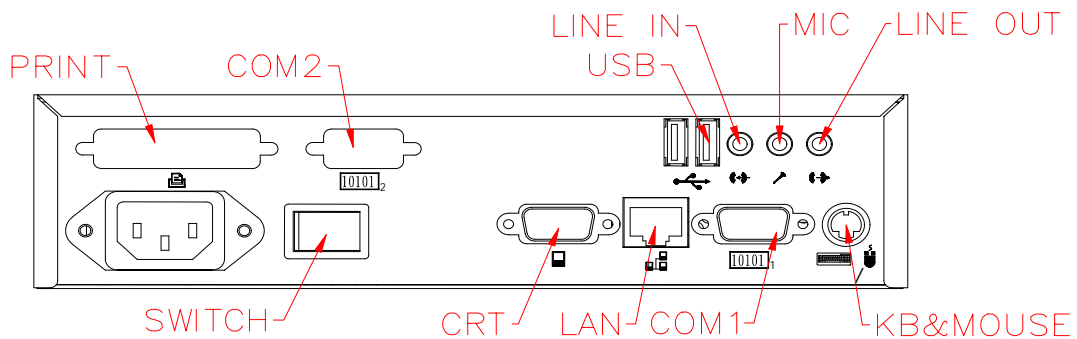


**Note:** Unscrew the screws when installing Compact Flash module.

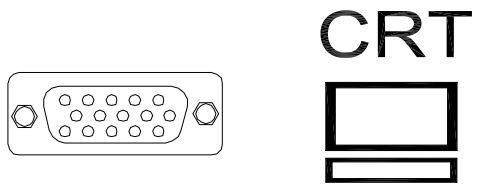
The Compact Flash socket (on the FX5600) supports 3.3V Compact Flash and Micro Drives. The JP is used to select master/slave device of this socket. Be sure to avoid the same master/slave setting with which connects to IDE connector, if you use CF and IDE hard disk simultaneously.

□ **Connecting the Monitor, Keyboard and Mouse**

Connector the monitor, keyboard and mouse to the FX5600 using the connections provided on the side of the chassis. See following figure and a side pictures.



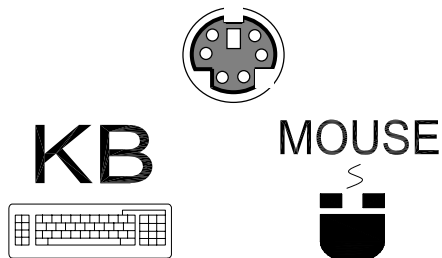
1. A VGA connector is provided for CRT display



**CRT**

DB15	Signal
1	Red
2	Green
3	Blue
13	Hsync
14	Vsync
12	DDC Data
15	DDC Clock
5 & 10	Digital Ground
6,7,8	Analog Ground
Others	Not Used

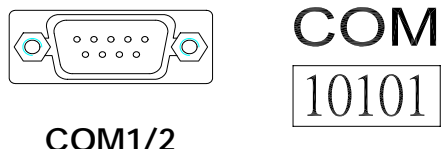
2. The connector use the included adapter cable you can attach standard PS/2 type keyboard and mouse. Standard PS/2 keyboard can be plugged into this connector without any adapter cable. If PS/2 keyboard and mouse will be used simultaneously, a Y-type (3-terminal) adapter cable is needed.



Pin 1	Mouse Data
Pin 2	Keyboard Data
Pin 3	Ground
Pin 4	VCC
Pin 5	Mouse Clock
Pin 6	Keyboard Clock

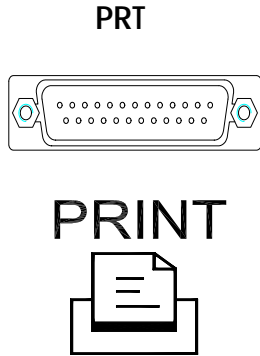
□ **Connecting the COM ports and Parallel Port**

The DB9 (COM1/2) is standard serials port connector. The following tables show the signal connections of these connectors.



DB-9	RS-232 Signal
1	-DCD2
6	-DSR2
2	RXD2
7	-RTS2
3	-TXD2
8	-CTS2
4	-DTR2
9	-RI2
5	Ground
Case	Case Ground

- The printer is standard DB25 connector.

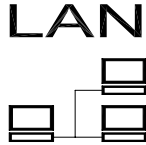
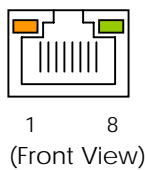


DB-25	Description	DB-25	Description
1	-STROBE	14	-AUTO FORM FEED
2	DATA 0	15	-ERROR
3	DATA 1	16	-INITIALIZE
4	DATA 2	17	-PRINTER SELECT IN
5	DATA 3	18	Ground
6	DATA 4	19	Ground
7	DATA 5	20	Ground
8	DATA 6	21	Ground
9	DATA 7	22	Ground
10	ACKNOWLEDGE	23	Ground
11	BUSY	24	Ground
12	PAPER	25	Ground
13	PRINTER SELECT	--	No Used

- Connecting the LAN port and USB Ports

The RJ45 connector with 2 LED's for LAN. The left side LED (orange) indicates data is being accessed and the right side LED (green) indicates on-line status. (On indicates on-line and off indicates off-line)

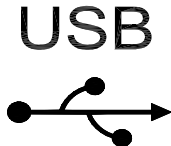
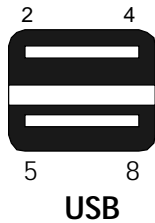
RJ45 connector



The following lists the pin assignment of RJ45.

LAN1/LAN2	Signal	LAN1/LAN2	Signal
1	TPTX+	5	FBG1
2	TPTX -	6	TPRX -
3	TPRX+	7	FBG2
4	FBG1	8	FBG2

The FX5600 supports a dual port USB connector. Any USB device can be attached to USB ports with plug-and-play supported. The up side port is USB #1 and the down side port is USB #2

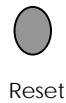


USB#1/#2	Signal	USB#1/#2	Signal
Pin 1	USBV0	Pin5	USBV1
Pin 2	USB0-	Pin6	USB1-
Pin 3	USB0+	Pin7	USB1+
Pin 4	USBG0	Pin8	USBG1

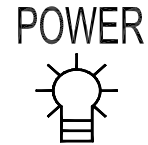
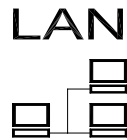
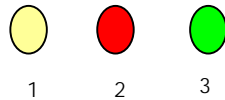


□ **LED Indicators and Reset Push Bottom (On the Front Panel)**

The FX5600 has a push bottom switcher for system reset; Push and release the bottom will cause hardware reset of FX5600 and restart system booting.



The Power/Watchdog, LAN and HDD LED has two distinctive status: Off for inactive operation and blinking light for activity.



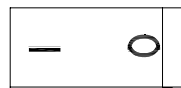
LED1: LAN LED (Yellow)

LED2: HDD LED (Red)

LED3: Power/Watchdog LED (Green)

□ **Connecting the DC Power Jack and Power Switch**

Power is supplied through AC power cable. Since the switch does include a power switch, plugging its power into a power outlet then switch power to on (1), when you final installed system hardware device.



1 : Power On  
O: Power Off

□ **Connecting the Audio Microphone In/ Speak Out**



Line-In



Mic-In



Line-Out

## Chapter 3 BIOS Setup

This chapter describes the FX5600A and FX5600B BIOS setup.

### Overview

BIOS are a program located on a Flash memory chip on a circuit board. It is used to initialize and set up the I/O peripherals and interface cards of the system, which includes time, date, hard disk drive, the ISA bus and connected devices such as the video display, diskette drive, and the keyboard. This program will not be lost when you turn off the system.

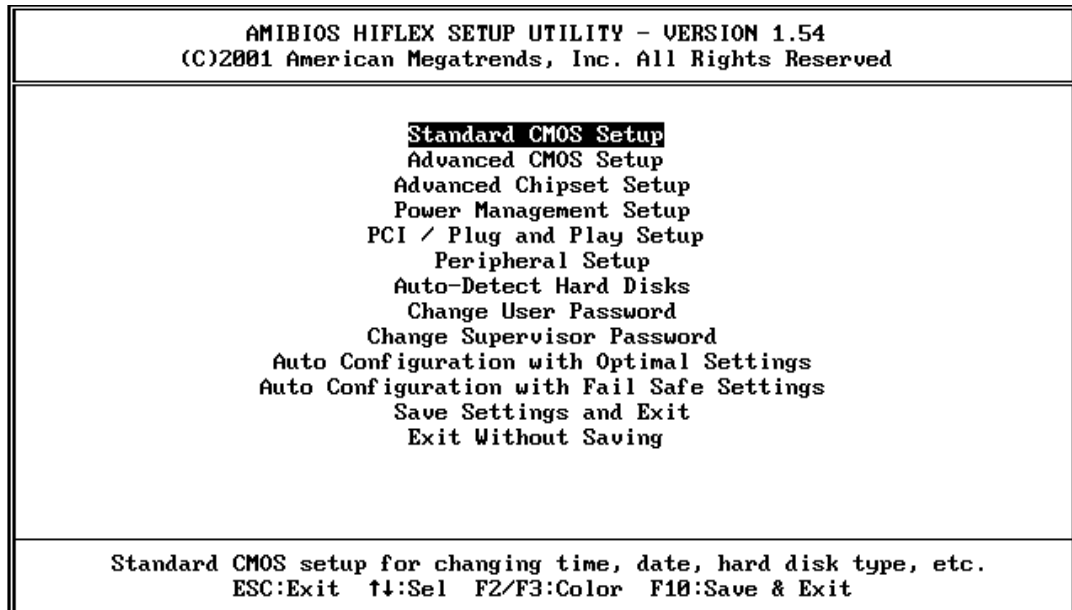
The BIOS provides a menu-driven interface to the console subsystem. The console subsystem contains special software, called firmware that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system.

The BIOS default values ensure that the system will function at its normal capability. In the worst situation the user may have corrupted the original settings set by the manufacturer.

All the changes you make will be saved in the system RAM and will not be lost after power-off.

When you start the system, the BIOS will perform a self-diagnostics test called Power On Self Test (POST) for all the attached devices, accessories, and the system. Press the [Del] key to enter the BIOS Setup program, and then the main menu will show on the screen.

**Note:** Change the parameters when you fully understand their functions and subsequence.



## BIOS Functions

On the menu, you can perform the following functions

1. Standard CMOS Setup
2. Advanced CMOS Setup
3. Advanced Chipset Setup
4. Power Management Setup
5. PCI/ Plug and Play Setup
6. Peripheral Setup
7. Auto-Detect Hard Disks
8. Change User Password
9. Change Supervisor Password
10. Auto Configuration with Optimal Settings: to auto configure the system according to optimal setting with pre-defined values. This is also the factory default setting of the system when you receive the board.
11. Auto Configuration with Fail Safe Settings: to configure the system in fail-safe mode with predefined values.
12. Save Settings and Exit: perform this function when you change the setting and exit the BIOS Setup program.
13. Exit without saving: perform this function when you want to exit the program and do not save the change.

### Keyboard Convention

On the BIOS, the following keys can be used to operate and manage the menu:

Item	Function
ESC	To exit the current menu or message
Page Up/Page Down	To select a parameter
F1	To display the help menu if you do not know the purpose or function of the item you are going to configure
F2/F3	To change the color of the menu display. F2 is to go forward and F3 is to go backward.
UP/Down Arrow Keys	To go upward or downward to the desired item

## STANDARD CMOS SETUP

This section describes basic system hardware configuration, system clock setup and error handling. If the CPU board is already installed in a working system, you will not need to select this option anymore.

AMIBIOS SETUP - STANDARD CMOS SETUP									
(C)2001 American Megatrends, Inc. All Rights Reserved									
Date (mm/dd/yyyy): Mon <b>Sep</b> 15,2003					Base Memory: 0 KB				
Time (hh/mm/ss) : 15:22:39					Extd Memory: 0 MB				
Floppy Drive A:		1.44 MB 3½							
Floppy Drive B:		Not Installed							
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO 32Bit Mode
Pri Master:	Auto								Off
Pri Slave :	Auto								Off
Sec Master:	Not Installed								
Sec Slave :	Not Installed								
Boot Sector Virus Protection					Disabled				
Month: Jan - Dec					ESC:Exit ↑:Sel				
Day: 01 - 31					PgUp/PgDn:Modify				
Year: 1980 - 2099					F1:Help F2/F3:Color				

### Date & Time Setup

Highlight the <Date> field and then press the [Page Up] / [Page Down] or [+]/[-] keys to set the current date. Follow the month, day and year format.

Highlight the <Time> field and then press the [Page Up] / [Page Down] or [+]/[-] keys to set the current date. Follow the hour, minute and second format.

The user can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

### Floppy Setup

The <Standard CMOS Setup> option records the types of floppy disk drives installed in the system.

To enter the configuration value for a particular drive, highlight its corresponding field and then select the drive type using the left-or right-arrow key.

## Hard Disk Setup

The BIOS supports various types for user settings, The BIOS supports <Pri Master>, <Pri Slave>, <Sec Master> and <Sec Slave> so the user can install up to four hard disks. For the master and slave jumpers, please refer to the hard disk's installation descriptions and the hard disk jumper settings.

You can select <AUTO> under the <TYPE> and <MODE> fields. This will enable auto detection of your IDE drives during boot up. This will allow you to change your hard drives (with the power off) and then power on without having to reconfigure your hard drive type. If you use older hard disk drives, which do not support this feature, then you must configure the hard disk drive in the standard method as described above by the <USER> option.

## Boot Sector Virus Protection

This option protects the boot sector and partition table of your hard disk against accidental modifications. Any attempt to write to them will cause the system to halt and display a warning message. If this occurs, you can either allow the operation to continue or use a bootable virus-free floppy disk to reboot and investigate your system. The default setting is <**Disabled**>. This setting is recommended because it conflicts with new operating systems. Installation of new operating system requires that you disable this to prevent write errors.

## FX5600A BIOS SETUP

### ADVANCED CMOS SETUP

AMIBIOS SETUP - ADVANCED CMOS SETUP		
(C)2001 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Enabled	<b>Available Options:</b> ▶ Read-Write Read-Only  ESC:Exit   ↑↓:Sel PgUp/PgDn:Modify F1:Help   F2/F3:Color
1st Boot Device	IDE-0	
2nd Boot Device	Floppy	
3rd Boot Device	CDROM	
Try Other Boot Devices	Yes	
Initial Display Mode	BIOS	
<b>Floppy Access Control</b>	<b>Read-Write</b>	
Hard Disk Access Control	Read-Write	
S.M.A.R.T. for Hard Disks	Disabled	
BootUp Num-Lock	On	
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Enabled	
System Keyboard	Absent	
Primary Display	Absent	
Password Check	Setup	
Boot To OS/2	No	
Wait For 'F1' If Error	Disabled	
Hit 'DEL' Message Display	Enabled	
C000,32k Shadow	Cached	
C800,16k Shadow	Cached	
CC00,16k Shadow	Disabled	
D000,16k Shadow	Disabled	
D400,16k Shadow	Disabled	
D800,16k Shadow	Disabled	
DC00,16k Shadow	Disabled	

This section describes the configuration entries that allow you to improve your system performance, or let you set up some system features according to your preference. Some entries here are required by the CPU board's design to remain in their default settings.

#### Quick Boot

This field is used to activate the quick boot function of the system. When set to Enabled,

1. BIOS will not wait for up to 40 seconds if a Ready signal is not received from the IDE drive, and will not configure its drive.
2. BIOS will not wait for 0.5 seconds after sending a RESET signal to the IDE drive.
3. You cannot run BIOS Setup at system boot since there is no delay for the Hit, Del. To run Setup message.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

### 1<sup>st</sup> –3<sup>rd</sup> Boot Device

These fields determine where the system attempts to look for the boot drive priority for an operating system. The default procedure is to check the hard disk, and then the floppy drive, and last the CDROM.

**Available options:** Disabled, IDE0-1, IDE-2, IDE-3, Floppy, CDROM, USB-FLOPPY, USB-CDROM and USB-HDD

**Default setting:** IDE-0 for 1<sup>st</sup> Boot device; Floppy for 2<sup>nd</sup> Boot Device; CDROM for 3<sup>rd</sup> Boot Device

### Try Other Boot Device

If all 3 1<sup>st</sup> –3<sup>rd</sup> boot devices specified by CMOS setup are not available to boot, BIOS will try to boot other available devices in following order if this question is set to “Enabled”.

### Initial Display Mode

This field specifies can set Normal POST screen (BIOS) or Boot with logo, no POST messages (Client).

### Floppy Access Control

This field specifies the read/write access when booting from a floppy drive.

**Available options:** Normal, Read-only

**Default setting:** Normal

### Hard Disk Access Control

This field specifies the read/write access when booting from a HDD drive.

**Available options:** Normal, Read-only

**Default setting:** Normal

### S.M.A.R.T for Hard Disk

This field is used to activate the S.M.A.R.T (System Management and Reporting Technologies) function for S.M.A.R.T HDD drives. This function requires an application that can give S.M.A.R.T message.

**Available options:** Disabled, Enabled

**Default:** Disabled



### Boot Up Num-lock

This field is used to activate the Num Lock function upon system boot. If the setting is on, after a boot, the Num Lock light is lit, and user can use the number key.

**Available options:** On, Off

**Default setting:** On

### Floppy Drive Swap

The field reverses the drive letter assignments of your floppy disk drives in the Swap A, B setting, otherwise leave on the default setting of **Disabled** (No Swap). This works separately from the BIOS Features floppy disk swap feature. It is functionally the same as physically interchanging the connectors of the floppy disk drives. When the function's setting is **<Enabled>**, the BIOS swapped floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A under DOS.

**Available options:** Disabled, Enabled

**Default setting:** Disabled

### Floppy Drive Seek

This field is used to set if the BIOS will seek the floppy <A> drive upon boot.

**Available Options:** Disabled, Enabled

**Default setting:** Disabled

### PS/2 Mouse Support

The setting of **Enabled** allows the system to detect a PS/2 mouse on boot up. If detected, IRQ12 will be used for the PS/2 mouse. IRQ 12 will be reserved for expansion cards if a PS/2 mouse is not detected. **Disabled** will reserve IRQ12 for expansion cards and therefore the PS/2 mouse will not function.

**Available options:** Disabled, Enabled

**Default setting:** Enable

### System Keyboard

This field specifies if an error message should be prompted when a keyboard is not attached.

**Available options:** Absent, Present

**Default setting:** Absent

### Primary Display

The field specifies the type of monitor installed in the system.

**Available options:** Absent, VGA/EGA, CGA40x25, CGA80x25, and Mono

**Default setting:** Absent

### Password Check

This field enables password checking every time the computer is powered on or every time the BIOS Setup is executed. If ***Always*** is chosen, a user password prompt appears every time and the BIOS Setup Program executes and the computer is turned on. If ***Setup*** is chosen, the password prompt appears if the BIOS executed.

**Available options:** Setup, Always

**Default setting:** Setup

### Boot To OS2

If OS2 operating system is used, and the system RAM is over 64MB, please select yes. Otherwise, select No.

**Available options:** Yes, No

**Default setting:** No

### Wait for 'F1' If Error

AMIBIOS POST error messages are followed by:

Press <F1> to continue

If this field is set to ***Disabled***, the AMIBIOS does not wait for you to press the <F1> key after an error message.

**Available options:** Disabled, Enabled

**Default setting:** Disabled

### Hit 'DEL' Message Display

Set this field to ***Disabled*** to prevent the message as follows:

Hit 'DEL' if you want to run setup

It will prevent the message from appearing on the first BIOS screen when the computer boots.

**Available options:** Disabled, Enabled

**Default setting:** Enabled

### **C000, 32k Shadow - E800, 32k shadow**

These fields control the location of the contents of the 32KB of ROM beginning at the specified memory location. If no adapter ROM is using the named ROM area, this area is made available to the local bus. The settings are:

1. **Disabled:** The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.
2. **Enabled:** The contents of C000h - C7FFFh are written to the same address in system memory (RAM) for faster execution.
3. **Cached/WP:** The contents of the named ROM area are written to the same address in system memory (RAM) for faster execution, if an adapter ROM will be using the named ROM area. Also, the contents of the RAM area can be read from and written to cache memory.

**Available options:** Disabled, Enabled, Cached

**Default setting:** Disabled

**Default setting:** Disable

## ADVANCED CHIPSET SETUP

This section describes the configuration of the board's chipset features.

AMIBIOS SETUP - ADVANCED CHIPSET SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
<b>SDRAM Timing by SPD</b>	<b>Disabled</b>	<b>Available Options:</b>
DRAM Refresh	15.6/11.7 uS	▶ Disabled
DRAM Cycle time (SCLKs)	7/9	Enabled
CAS# Latency (SCLKs)	3	
RAS to CAS delay (SCLKs)	3	
SDRAM RAS# Precharge (SCLKs)	3	
Internal Graphics Mode Select	1MB	
AGP Aperture Window	64MB	
CPU Latency Tiner	Disabled	
USB Function	Enabled	
USB Device Legacy Support	All Device	
		ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color

### SDRAM Timing by SPD

SPD represents Serial Presence Detect. It is an 8-bit, 2048 bits EEPROM, built on the SDRAM for 100 MHz frequencies. If the installed SDRAM supports SPD function, select SPD. If not, you can select based on other access time of the SDRAM.

**Available Options:** Disabled, Enabled

**Default setting:** Disabled

### DRAM Refresh

This specifies the DRAM refresh rate.

**Available Options:** 15.6/11.7 us, 7.8/5.85 us and 1.28/0.96 us

**Default setting:** 15.6/11.7 us

### DRAM Cycle Time (SCLKs)

This field specifies control the number of DRAM for an access cycles.

**Available Options:** 5/7 and 7/9

**Default setting:** 7/9

### **CAS# Latency (SCLKs)**

This field specifies the latency for the Synchronous DRAM system memory signals.

**Available Options:** 3, 2

**Default setting:** 3

### **RAS# to CAS# delay (SCLKs)**

This field specifies the length of the delay inserted between RAS and CAS signals of the Synchronous DRAM system access cycle when SDRAM is installed.

**Available Options:** 3, 2

**Default setting:** 3

### **SDRAM RAS# Precharge (SCLKs)**

This field specifies the length of the RAS precharge part of the Synchronous DRAM access cycle when SDRAM is installed.

**Available Options:** 3, 2

**Default setting:** 3

### **Internal Graphics Mode Select**

This field Enable/Disable the internal graphics device and selects the amount of main memory that is dedicated to support the internal graphics device in VGA (non-linear) mode only.

**Available Options:** 512kB, 1MB and Disable

**Default setting:** 1 MB

### **Graphics Aperture Size**

This field specifies the system memory size that can be used by the Accelerated Graphics Port (AGP).

**Available Options:** 32MB, 64MB

**Default setting:** 64 MB

### **CPU Latency Timer**

This field specifies the latency for the Synchronous DRAM system memory signals.

**Available Options:** 3, 2

**Default setting:** 3

#### **USB Function**

Select Enabled if a USB device is installed to the system. If Disabled are selected, the system will not be able to use a USB device.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

#### **USB Device Legacy Support**

Select All Device if a USB device is installed to the system. If Disabled are selected, the system will not be able to use a USB device.

**Available Options:** Disabled, Mice and All Devices

**Default setting:** All Devices

## POWER MANAGEMENT

AMIBIOS SETUP - POWER MANAGEMENT SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
<b>Power Management/APM</b>	<b>Enabled</b>	<b>Available Options:</b> Disabled ▶ Enabled
Video Power Down Mode	Disabled	
Hard Disk Power Down Mode	Disabled	
Standby Time Out	Disabled	
Suspend Time Out	Disabled	
		ESC:Exit F1:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color

### Power Management /APM

Select Enabled to activate the chipset Power Management and APM (Advanced Power Management) features.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

### Video Power Down Mode

This field specifies the power conserving state that video subsystem enters after the specified period of display inactivity has expired.

**Available Options:** Disabled, Standby, Suspend

**Default setting:** Disabled

### Hard Disk Power Down Mode

This field specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired.

**Available Options:** Disabled, Standby, Suspend

**Default setting:** Disabled

### **Standby Time Out (Minute)**

This field specifies the length of a period of system inactivity (like hard disk or video) while in full power on state. When this length of time expires, the system enters Standby power state.

**Available Options:** Disabled, 1 Minute, 2 Minute, 4 Minute, and 8 Minute

**Default setting:** Disabled

### **Suspend Time Out (Minute)**

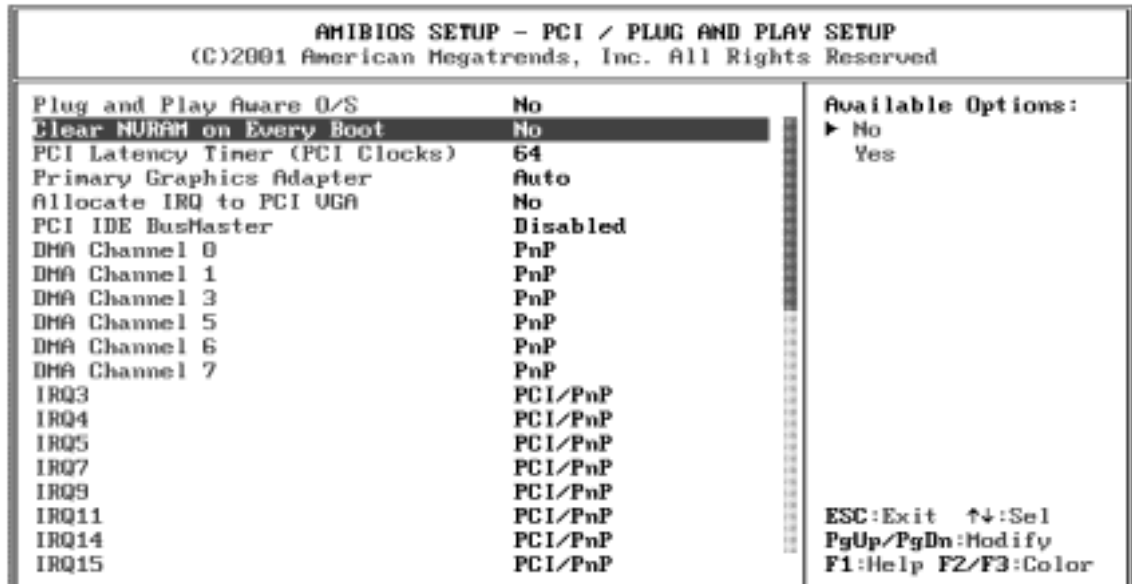
This field specifies the length of a period of system inactivity (like hard disk or video) while in Standby state. When this length of time expires, the system enters Suspend power state.

**Available Options:** Disabled, 1 Minute, 2 Minute, 4 Minute, and 8 Minute, up to 60 Minute.

**Default setting:** Disabled



## PCI/PLUG AND PLAY



### Plug and Plug Aware O/S

Set to Yes to inform BIOS that the operating system can handle Plug and Play (PnP) devices.

**Available Options:** Yes, No

**Default setting:** No

### PCI Latency Timer

This field specifies the latency timings (in PCI clock) PCI devices installed in the PCI expansion bus.

**Available Options:** 32, 64, 96, 128, 160, 192, 224, and 248

**Default setting:** 64

### Primary Graphics Adapter

This field specifies which VGA display will be used when the system is boot. You can select either the onboard AGP or the VGA card installed on the PCI bus.

**Available Options:** AGP, PCI

**Default setting:** PCI

### PCI VGA Palette Snoop

When Enabled is selected, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit. (0 is disabled).

**Available Options:**

Disabled: Data read and written by the CPU is only directed to the PCI VGA devices palette registers.

Enabled: Data read and written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device palette registers, permitting the palette registers of both devices to be identical.

**Default setting:** Disable

### Allocate IRQ to PCI AGP

When a PCI or AGP VGA device is installed, you can assign an IRQ to this device. Selecting Yes, BIOS will auto-assign IRQ to the device. Selecting No, no IRQ will be assigned to the VGA device.

**Available Options:** Yes, No

**Default setting:** No

### PCI IDE BusMaster

This option is to specify that the IDE controller on the PCI local bus have bus-mastering capability.

**Available Options:** Enable, Disable

**Default setting:** Disable

### DMA Channel 0 – 7

When I/O resources are controlled manually, you can assign each system DMA as one of the following types, based on the type of device using the interrupt:

ISA/EISA devices comply with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ5 for COM1).

PnP (PCI/ISA) devices: comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

**Available Options:** PnP, ISA/EISA

**Default setting:** PnP

### **IRQ 3 –15**

When I/O resources are controlled manually, you can assign each system interrupt as one of the following types, based on the type of device using the interrupt:

ISA/EISA devices comply with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ5 for COM1).

PnP (PCI/ISA) devices: comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

## PERIPHERAL SETUP

This section describes the function of peripheral features.

AMIBIOS SETUP - PERIPHERAL SETUP		
(C)2001 American Megatrends, Inc. All Rights Reserved		
<b>OnBoard FDC</b>	<b>Auto</b>	<b>Available Options:</b> ▶ Auto Disabled Enabled  ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color
OnBoard Serial Port1	Auto	
OnBoard Serial Port2	Auto	
OnBoard Parallel Port	Auto	
Parallel Port Mode	Normal	
Parallel Port IRQ	Auto	
Parallel Port DMA Channel	N/A	
Read Com Port Mode of Status	Hardware	
Com Port Mode Selection	RS-232	
On-Chip IDE	Both	

### OnBoard FDC

This field enables the floppy drive controller on the FB2642.

**Available Options:** Disabled, Enabled and Auto

**Default setting:** Auto

### OnBoard Serial Port 1

These fields select the I/O port address for each Serial port. Refer to Table 2-2.

**Available Options:** Auto, Disabled, 3F8H/COM1, 2F8H/COM2, and 3E8H/COM3, 2E8H/COM4.

**Default setting:** Auto

### OnBoard Serial Port 2

These fields select the I/O port address for each Serial port. Refer to Table 2-2.

**Available Options:** Auto, Disabled, 3F8H/COM1, 2F8H/COM2, and 3E8H/COM3, 2E8H/COM4.

**Default setting:** Auto

### OnBoard Parallel Port

This field selects the I/O port address for parallel port.

**Available Options:** Auto, Disabled, 378, 278, and 3BCH

**Default setting:** Auto

### Parallel Port Mode

This field specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IEEE P1284 specifications.

**Available Options:** N/A, Normal, Bi-Dir, EPP, and ECP

**Default setting:** Normal

### Parallel Port IRQ

This field specifies the IRQ for the parallel port.

**Available Options:** Auto, N/A, 5, 7

**Default setting:** Auto

### Parallel Port DMA Channel

This option is only available if the setting for the parallel Port Mode option is ECP.

**Available Options:** N/A, 0,1,3

**Default setting:** N/A

### Read Com Port Mode State

These fields are auto detected SW1-4 Setting, that can set use BIOS or adjust SW1.

**Available Options:** Software, Hardware

**Default setting:** Hardware

### Com Port Mode Selection

These fields item can select RS-232, RS-422, and RS-485 of Serial port 2.

**Available Options:** RS-232, RS-422 and RS-485

**Default setting:** RS-232

### **On-Chip IDE**

This field specifies the IDE channel that can be applied when using CN3 IDE hard disk connector.

**Available Options:** Disabled, Primary, and Secondary, Both

**Default setting:** Both

## Hardware Monitor Setup

On the Hardware Monitor Setup screen, you can set up or monitor the system temperature, CPU voltage, and CPU fan speed...

<b>AMIBIOS SETUP - HARDWARE MONITOR SETUP</b> (C)2001 American Megatrends, Inc. All Rights Reserved	
Current CPU Temperature	0°C/32°F
Current System Temperature	0°C/32°F
Current Ext. Temperature	0°C/32°F
Fan1 Speed	0 RPM
Fan2 Speed	0 RPM
CPU1 VCORE	+1.7930
CPU2 VCORE	+1.4990
+ 1.800V	+1.7980
+ 2.500V	+2.4940
+ 3.300V	+3.2040
+ 5.000V	+4.9770
+ 12.00V	+11.9970
- 12.00V	-12.4200
VBAT	+3.2840
ESC:Exit   ↑:Sel PgUp/PgDn:Modify F1:Help   F2/F3:Color	

## System Hardware Monitor

In this field, you can monitor or detect the followings items. These items are view-only and cannot be changed.

- Current CPU Temperature
- Current System Temperature
- Current Ext. Temperature
- Fan1 Speed
- Fan2 Speed
- CPU1 VCORE
- CPU2 VCORE
- +1.800V
- +2.500V
- +3.300V
- +5.000V
- +12.00V
- -12.00V
- VBAT (On board Battery)

## FX5600B BIOS SETUP

### ADVANCED CMOS SETUP

AMIBIOS SETUP - ADVANCED CMOS SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Enabled	
1st Boot Device	IDE-0	
2nd Boot Device	Floppy	
3rd Boot Device	CD/DVD	
Try Other Boot Devices	Yes	
Initial Display Mode	BIOS	
Floppy Access Control	Read-Write	
Hard Disk Access Control	Read-Write	
S.M.A.R.T. for Hard Disks	Disabled	
<b>BootUp Num-Lock</b>	<b>On</b>	▲ Available Options: Off ▶ On
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Enabled	
System Keyboard	Absent	
Primary Display	Absent	
Password Check	Setup	
Boot To OS/2	No	
Wait For 'F1' If Error	Disabled	
Hit 'DEL' Message Display	Enabled	
L1 Cache	WriteBack	
L2 Cache	WriteBack	
C000, 16k Shadow	Cached/WP	
C400, 16k Shadow	Cached/WP	
C800, 16k Shadow	Cached/WP	
CC00, 16k Shadow	Disabled	
D000, 16k Shadow	Disabled	
D400, 16k Shadow	Disabled	
D800, 16k Shadow	Disabled	
DC00, 16k Shadow	Disabled	

ESC:Exit ↑↓:Sel  
PgUp/PgDn:Modify  
F1:Help F2/F3:Color

This section describes the configuration entries that allow you to improve your system performance, or let you set up some system features according to your preference. Some entries here are required by the CPU board's design to remain in their default settings.

#### Quick Boot

This field is used to activate the quick boot function of the system. When set to Enabled,

4. BIOS will not wait for up to 40 seconds if a Ready signal is not received from the IDE drive, and will not configure its drive.
5. BIOS will not wait for 0.5 seconds after sending a RESET signal to the IDE drive.
6. You cannot run BIOS Setup at system boot since there is no delay for the Hit, Del. To run Setup message.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled



### 1<sup>st</sup> –3<sup>rd</sup> Boot Device

These fields determine where the system attempts to look for the boot drive priority for an operating system. The default procedure is to check the hard disk, and then the floppy drive, and last the CDROM.

**Available options:** Disabled, IDE0-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CD/DVD, USB-FLOPPY, USB-CDROM, USB-HDD and SCSI, Network

**Default setting:** IDE-0 for 1<sup>st</sup> Boot device; Floppy for 2<sup>nd</sup> Boot Device; CDROM for 3<sup>rd</sup> Boot Device

### Try Other Boot Device

If all 3 1<sup>st</sup> –3<sup>rd</sup> boot devices specified by CMOS setup are not available to boot, BIOS will try to boot other available devices in following order if this question is set to “Enabled”.

### Initial Display Mode

This field specifies can set Normal POST screen (BIOS) or Boot with logo, no POST messages (Client).

### Floppy Access Control

This field specifies the read/write access when booting from a floppy drive.

**Available options:** Normal, Read-only

**Default setting:** Normal

### Hard Disk Access Control

This field specifies the read/write access when booting from a HDD drive.

**Available options:** Normal, Read-only

**Default setting:** Normal

### S.M.A.R.T for Hard Disk

This field is used to activate the S.M.A.R.T (System Management and Reporting Technologies) function for S.M.A.R.T HDD drives. This function requires an application that can give S.M.A.R.T message.

**Available options:** Disabled, Enabled

**Default:** Disabled

### Boot Up Num-lock

This field is used to activate the Num Lock function upon system boot. If the setting is on, after a boot, the Num Lock light is lit, and user can use the number key.

**Available options:** On, Off

**Default setting:** On

### Floppy Drive Swap

The field reverses the drive letter assignments of your floppy disk drives in the Swap A, B setting, otherwise leave on the default setting of *Disabled* (No Swap). This works separately from the BIOS Features floppy disk swap feature. It is functionally the same as physically interchanging the connectors of the floppy disk drives. When the function's setting is *<Enabled>*, the BIOS swapped floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A under DOS.

**Available options:** Disabled, Enabled

**Default setting:** Disabled

### Floppy Drive Seek

This field is used to set if the BIOS will seek the floppy <A> drive upon boot.

**Available Options:** Disabled, Enabled

**Default setting:** Disabled

### PS/2 Mouse Support

The setting of *Enabled* allows the system to detect a PS/2 mouse on boot up. If detected, IRQ12 will be used for the PS/2 mouse. IRQ 12 will be reserved for expansion cards if a PS/2 mouse is not detected. *Disabled* will reserve IRQ12 for expansion cards and therefore the PS/2 mouse will not function.

**Available options:** Disabled, Enabled

**Default setting:** Enable

### System Keyboard

This field specifies if an error message should be prompted when a keyboard is not attached.

**Available options:** Absent, Present

**Default setting:** Absent

### Primary Display

The field specifies the type of monitor installed in the system.

**Available options:** Absent, VGA/EGA, CGA40x25, CGA80x25, and Mono

**Default setting:** Absent

### Password Check

This field enables password checking every time the computer is powered on or every time the BIOS Setup is executed. If ***Always*** is chosen, a user password prompt appears every time and the BIOS Setup Program executes and the computer is turned on. If ***Setup*** is chosen, the password prompt appears if the BIOS executed.

**Available options:** Setup, Always

**Default setting:** Setup

### Boot To OS2

If OS2 operating system is used, and the system RAM is over 64MB, please select yes. Otherwise, select No.

**Available options:** Yes, No

**Default setting:** No

### Wait for 'F1' If Error

AMIBIOS POST error messages are followed by:

Press <F1> to continue

If this field is set to ***Disabled***, the AMIBIOS does not wait for you to press the <F1> key after an error message.

**Available options:** Disabled, Enabled

**Default setting:** Disabled

### Hit 'DEL' Message Display

Set this field to ***Disabled*** to prevent the message as follows:

Hit 'DEL' if you want to run setup

It will prevent the message from appearing on the first BIOS screen when the computer boots.

**Available options:** Disabled, Enabled

**Default setting:** Enabled

#### **C000, 32k Shadow - E800, 32k shadow**

These fields control the location of the contents of the 32KB of ROM beginning at the specified memory location. If no adapter ROM is using the named ROM area, this area is made available to the local bus. The settings are:

4. **Disabled:** The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.
5. **Enabled:** The contents of C000h - C7FFFh are written to the same address in system memory (RAM) for faster execution.
6. **Cached/WP:** The contents of the named ROM area are written to the same address in system memory (RAM) for faster execution, if an adapter ROM will be using the named ROM area. Also, the contents of the RAM area can be read from and written to cache memory.

**Available options:** Disabled, Enabled, Cached

**Default setting:** Disabled

**Default setting:** Disable

## ADVANCED CHIPSET SETUP

This section describes the configuration of the board's chipset features.

AMIBIOS SETUP - ADVANCED CHIPSET SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
***** DRAM Timing *****		Available Options: ▶ Disabled Enabled
<b>Configure SDRAM Timing by SPD</b>	<b>Disabled</b>	
DRAM Frequency	100Mhz	
SDRAM CAS# Latency	3	
AGP Mode	4x	
AGP Aperture Size	64MB	
USB Controller	Enabled	
USB Device Legacy Support	All Device	
OnChip UGA Frame Buffer Size	8MB	
Boot Screen Select	CRT	
LCD Panel Type	1	
ATX Power Supply Controller	Disabled	
		ESC:Exit ↑:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color

### Configure SDRAM Timing by SPD

SPD represents Serial Presence Detect. It is an 8-bit, 2048 bits EEPROM, built on the SDRAM for 100 MHz frequencies. If the installed SDRAM supports SPD function, select SPD. If not, you can select based on other access time of the SDRAM.

**Available Options:** Disabled, Enabled

**Default setting:** Disabled

### DRAM Frequency

This specifies the SDRAM memory clock frequency.

**Available Options:** 100MHz, 133MHz

**Default setting:** 100MHz

### SDRAM CAS# Latency (SCLKs)

This field specifies the latency for the Synchronous DRAM system memory signals.

**Available Options:** 3, 2

**Default setting:** 3

### AGP Mode

This field select AGP transfers video data.

**Available Options:** 1x, 2x and 4x

**Default setting:** 4x

### **AGP Aperture Size**

This field specifies the system memory size that can be used by the Accelerated Graphics Port (AGP).

**Available Options:** 4MB, 8MB, 16MB, 32MB, 64MB, 128MB and 256MB

**Default setting:** 64 MB

### **USB Control**

Select Enabled if a USB device is installed to the system. If Disabled are selected, the system will not be able to use a USB device.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

### **USB Device Legacy Support**

Select All Device if a USB device is installed to the system. If Disabled are selected, the system will not be able to use a USB device.

**Available Options:** Disabled, All Device

**Default setting:** All Device

### **OnChip VGA Frame Buffers Size**

This field is share memory architecture (SMA) for frame buffer memory. SMA allows system memory to be efficiently share by the host CPU and allocated depending on user preference, application requirements, and total size of system memory.

**Available Options:** None, 2MB, 4MB, 8MB, 16MB and 32MB

**Default setting:** 8 MB

**Default setting:** 8 MB

## POWER MANAGEMENT

AMIBIOS SETUP - POWER MANAGEMENT SETUP		
(C)2001 American Megatrends, Inc. All Rights Reserved		
ACPI Aware O/S	No	Available Options: ▶ Disabled Enabled
Power Management/APM	Disabled	
Video Power Down Mode	Disabled	ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color
Hard Disk Power Down Mode	Disabled	
Standby Time Out (Minute)	Disabled	
Suspend Time Out (Minute)	Disabled	
Throttle Slow Clock Ratio	50%-56.25%	
Display Activity	Ignore	
IRQ3	Monitor	
IRQ4	Monitor	
IRQ5	Ignore	
IRQ7	Monitor	
IRQ9	Ignore	
IRQ10	Ignore	
IRQ11	Ignore	
IRQ13	Ignore	
IRQ14	Monitor	
IRQ15	Ignore	
<b>Resume On RTC Alarm</b>	<b>Disabled</b>	
RTC Alarm Date	15	
RTC Alarm Hour	12	
RTC Alarm Minute	30	
RTC Alarm Second	30	

### ACPI Aware O/S

This field specifies allow you enable Advanced Configuration and Power Management. When you use Windows/OS standby mode can set to enable.

**Available Options:** Disabled, Enabled

**Default setting:** Disable

### Power Management /APM

Select Enabled to activate the chipset Power Management and APM (Advanced Power Management) features.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

### Video Power Down Mode

This field specifies the power conserving state that video subsystem enters after the specified period of display inactivity has expired.

**Available Options:** Disabled, Standby, Suspend

**Default setting:** Disabled

### Hard Disk Power Down Mode

This field specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired.

**Available Options:** Disabled, Standby, Suspend

**Default setting:** Disabled

### Standby Time Out (Minute)

This field specifies the length of a period of system inactivity (like hard disk or video) while in full power on state. When this length of time expires, the system enters Standby power state.

**Available Options:** Disabled, 1 Minute, 2 Minute, 4 Minute, and 8 Minute, up to 60 Minute.

**Default setting:** Disabled

### Suspend Time Out (Minute)

This field specifies the length of a period of system inactivity (like hard disk or video) while in Standby state. When this length of time expires, the system enters Suspend power state.

**Available Options:** Disabled, 1 Minute, 2 Minute, 4 Minute, and 8 Minute, up to 60 Minute.

**Default setting:** Disabled

### Throttle Slow Clock Ratio

When the system enter Suspend or standby mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

**Available Options:** 0%-6.25, 25%37.5%, 75%87.5% and 93.75%-100%

**Default setting:** 50%-56.25%

### IRQ3 ~IRQ15

This field specifies the power down mode of the system based on the device. When the system does not receive signals from the device, it will enter the Power Down mode immediately. To enable the power saving mode, select Monitor. To disable it, select Ignore.

### Resume On RTC Alarm

This field specifies the RTC alarm to be turned off by extra software.



**Available Options:** Disabled, Enabled

**Default setting:** Disabled

#### RTC Alarm Date

This field specifies the date of the RTC alarm.

**Available Options:** 1, 31

**Default setting:** 15

#### RTC Alarm Hour

This field specifies the hour of the RTC alarm.

**Available Options:** 1-24

**Default setting:** 12

#### RTC Alarm Minute

This field specifies the minute of the RTC alarm.

**Available Options:** 1-60

**Default setting:** 30

#### RTC Alarm Second

This field specifies the second of the RTC alarm.

**Available Options:** 1-60

**Default setting:** 30

## PCI/PLUG AND PLAY

AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP		
(C)2001 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	No	Available Options:
Clear NURAM	No	▶ 32
<b>PCI Latency Timer (PCI Clocks)</b>	<b>32</b>	64
Primary Graphics Adapter	PCI	96
PCI UGA Palette Snoop	Disabled	128
Allocate IRQ to PCI UGA	No	160
PCI IDE BusMaster	Disabled	192
DMA Channel 0	PnP	224
DMA Channel 1	PnP	248
DMA Channel 3	PnP	
DMA Channel 5	PnP	248
DMA Channel 6	PnP	
DMA Channel 7	PnP	
IRQ3	PCI/PnP	
IRQ4	PCI/PnP	
IRQ5	PCI/PnP	
IRQ7	PCI/PnP	
IRQ9	PCI/PnP	
IRQ10	PCI/PnP	
IRQ11	PCI/PnP	
IRQ14	PCI/PnP	
IRQ15	PCI/PnP	

ESC:Exit ↑↓:Sel  
PgUp/PgDn:Modify  
F1:Help F2/F3:Color

### Plug and Plug Aware O/S

Set to Yes to inform BIOS that the operating system can handle Plug and Play (PnP) devices.

**Available Options:** Yes, No

**Default setting:** No

### PCI Latency Timer

This field specifies the latency timings (in PCI clock) PCI devices installed in the PCI expansion bus.

**Available Options:** 32, 64, 96, 128, 160, 192, 224, and 248

**Default setting:** 64

### Primary Graphics Adapter

This field specifies which VGA display will be used when the system is boot. You can select either the onboard AGP or the VGA card installed on the PCI bus.

**Available Options:** AGP, PCI

**Default setting:** PCI

### PCI VGA Palette Snoop

When Enabled is selected, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit. (0 is disabled).

#### **Available Options:**

Disabled: Data read and written by the CPU is only directed to the PCI VGA devices palette registers.

Enabled: Data read and written by the CPU is directed to both the PCI VGA devices palette registers.

**Default setting:** Disable

### Allocate IRQ to PCI AGP

When a PCI or AGP VGA device is installed, you can assign an IRQ to this device. Selecting Yes, BIOS will auto-assign IRQ to the device. Selecting No, no IRQ will be assigned to the VGA device.

**Available Options:** Yes, No

**Default setting:** No

### PCI IDE BusMaster

This option is to specify that the IDE controller on the PCI local bus have bus-mastering capability.

**Available Options:** Enable, Disable

**Default setting:** Disable

### DMA Channel 0 – 7

When I/O resources are controlled manually, you can assign each system DMA as one of the following types, based on the type of device using the interrupt:

ISA/EISA devices comply with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ5 for COM1).

PnP (PCI/ISA) devices: comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

**Available Options:** PnP, ISA/EISA

**Default setting:** PnP

### **IRQ 3 –15**

When I/O resources are controlled manually, you can assign each system interrupt as one of the following types, based on the type of device using the interrupt:

ISA/EISA devices comply with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ5 for COM1).

PnP (PCI/ISA) devices: comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

## PERIPHERAL SETUP

This section describes the function of peripheral features.

AMIBIOS SETUP - PERIPHERAL SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
<b>OnBoard FDC</b>	<b>Auto</b>	<b>Available Options:</b> ▶ Auto Disabled Enabled  ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color
OnBoard Serial Port1	Auto	
OnBoard Serial Port2	Auto	
OnBoard Parallel Port	Auto	
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port DMA Channel	N/A	
Parallel Port IRQ	Auto	
Read Com Port Mode of Status	Hardware	
Com Port Mode Selection	RS-232	
OnBoard IDE	Both	
IDE Connection Cable	40-Pin	
OnBoard AC'97 Audio	Enabled	
OnBoard Legacy Audio	Disabled	
Sound Blaster	Disabled	
SB I/O Base Address	220h-22Fh	
SB IRQ Select	5	
SB DMA Select	1	

### OnBoard FDC

This field enables the floppy drive controller on the FB2644.

**Available Options:** Disabled, Enabled and Auto

**Default setting:** Auto

### OnBoard Serial Port 1

These fields select the I/O port address for each Serial port. Refer to Table 2-2.

**Available Options:** Auto, Disabled, 3F8H/COM1, 2F8H/COM2, and 3E8H/COM3, 2E8H/COM4.

**Default setting:** Auto

### OnBoard Serial Port 2

These fields select the I/O port address for each Serial port. Refer to Table 2-2.

**Available Options:** Auto, Disabled, 3F8H/COM1, 2F8H/COM2, and 3E8H/COM3, 2E8H/COM4.

**Default setting:** Auto

### OnBoard Parallel Port

This field selects the I/O port address for parallel port.

**Available Options:** Auto, Disabled, 378, 278, and 3BCH

**Default setting:** Auto

#### **EPP Version**

This field specifies the EPP version for the Parallel Port Mode specification used in the system and is not configurable. If Normal or ECP is selected, this field displays N/A, meaning not available.

**Available Options:** N/A, 1.7, 1.9

**Default setting:** N/A

#### **Parallel Port Mode**

This field specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IEEE P1284 specifications.

**Available Options:** N/A, Normal, Bi-Dir, EPP, and ECP

**Default setting:** Normal

#### **Parallel Port IRQ**

This field specifies the IRQ for the parallel port.

**Available Options:** Auto, N/A, 5, 7

**Default setting:** Auto

#### **Parallel Port DMA Channel**

This option is only available if the setting for the parallel Port Mode option is ECP.

**Available Options:** N/A, 0,1,3

**Default setting:** N/A

#### **Read Com Port Mode of Status**

These fields are auto detected SW1-4 Setting, that can set use BIOS or adjust SW1.

**Available Options:** Software, Hardware

**Default setting:** Hardware

#### **Com Port Mode Selection**

These fields item can select RS-232, RS-422, and RS-485 of Serial port 2.

**Available Options:** RS-232, RS-422 and RS-485

**Default setting:** RS-232

### On-Chip IDE

This field specifies the IDE channel that can be applied when using CN3 IDE hard disk connector.

**Available Options:** Disabled, Primary, and Secondary, Both

**Default setting:** Both

### IDE Connection Cable

This field specifies the select IDE use 40-pin or 40pin-80 conductor cable that can be applied when using UltraDMA/66/100 devices on CN3 IDE hard disk connector.

**Available Options:** 40-pin, 80-pin

**Default setting:** 40-pin

### OnBoard AC'97 Audio

This field specifies the internal Audio Control.

**Available Options:** Disable, Enable

**Default setting:** Enable

### OnBoard AC'97 Modem

This field specifies the internal Modem Control.

**Available Options:** Disable, Enable

**Default setting:** Enable

### Sound Blaster

This field if you want to use the SOUND Blaster emulation feature.

**Available Options:** Disable, Enable

**Default setting:** Disable

### SB I/O Base Address

These fields select the I/O port address for Audio.

**Available Options:** 220H~22FH, 240H~24FH, 260H~26FH and 280~28FH

**Default setting:** 220H~22FH

### **SB IRQ Select**

This field specifies the IRQ for the Audio.

**Available Options:** Disable, 5,7 and 10

**Default setting:** 5

### **SB DMA Select**

This field specifies the DMA for internal Audio Control.

**Available Options:** Disable, 0, 1,2 and 3

**Default setting:** 1



## Hardware Monitor Setup

On the Hardware Monitor Setup screen, you can set up or monitor the system temperature, CPU voltage, and VIA C3 CPU Ration and CPU fan speed...

<b>AMIBIOS SETUP - HARDWARE MONITOR SETUP</b> (C)2001 American Megatrends, Inc. All Rights Reserved	
--≡ System Hardware Monitor ≡--	
Current CPU Temperature	
Current Ext. Temperature	
Fan1 Speed	0 RPM
Fan2 Speed	0 RPM
CPU VCORE	+1.125U
CPU VTT	+1.500U
+ 3.300U	+3.359U
+ 5.000U	+4.975U
+12.000U	+12.077U
	ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color

## System Hardware Monitor

In this field, you can monitor or detect the followings items. These items are view-only and cannot be changed.

- Current CPU Temperature
- Current Ext. Temperature
- Fan1 Speed
- Fan2 Speed
- CPU1 VCORE
- CPU VTT
- +3.300V
- +5.000V
- +12.00V

## Password Setup

There are two security passwords: Supervisor and User. Supervisor is a privileged person that can change the User password from the BIOS.

According to the default setting, both access passwords are not set up and are only valid after you set the password from the BIOS.

To set the password, please complete the following steps.

1. Select **Change Supervisor Password**.
2. Type the desired password (up to 8 character length) when you see the message, "Enter New Supervisor Password."
3. Then you can go on to set a user password (up to 8 character length) if required. Note that you cannot configure the User password until the Supervisor password is set up.
4. Enter Advanced CMOS Setup screen and point to the Password Checkup field.
5. Select Always or Setup.
  - ✧ **Always:** a visitor who attempts to enter BIOS or operating system will be prompted for password.
  - ✧ **Setup:** a visitor who attempts to the operating system will be prompted for user password. You can enter either User password or Supervisor password.
6. Point to **Save Settings and Exit** and press Enter.
7. Press Y when you see the message, "Save Current Settings and Exit (Y/N)?"

Note: it is suggested that you write down the password in a safe place to avoid that password may be forgotten or missing.

To set the password, please complete the following steps.

1. Select **Change Supervisor Password**.
2. Press Enter instead of entering any character when you see the message, "Enter New Supervisor Password."
3. Thus you can disable the password.



## Chapter 4 Software Installation

The enclosed diskette includes FX5600 Series VGA and LAN driver. To install and configure your FX5600 system, you need to perform the following steps.

### FX5600 Soft Driver

#### FX5600A VGA /AUDIO Driver for WIN98/WIN95

Step 1: To install the VGA driver, insert the CD ROM into the CD ROM device, and enter DRIVER>VGA>I815e>WIN98. If your system is not equipped with a CD ROM device, copy the VGA driver from the CD ROM to a 1.44" diskette.

Step 2: Execute WIN9Xe67.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done!

No, I will restart my computer later.

System must be restart then complete the installation.

Step 5: In the WINDOWS98/ME, you can find the <DISPLAYL> icon located in the {CONTROL PANEL} group.

Step 6: Adjust the <Refresh Rate>, <Font size> and <Resolution>.

**Note:** In the VGA/Audio/SysChip >I815e NT4.0, 2000 or XP directory, a Readme\_xxx.txt file is included to provide installation information or Visit to <http://developer.intel.com/design/software/drivers/platform/inf.htm>

### FX5600B VGA/Audio Driver for WIN98/WIN95

- Step 1: To install the VGA driver, insert the CD ROM into the CD ROM device, and enter DRIVER>VGA>Via8606>Win98\_Me. If your system is not equipped with a CD ROM device, copy the VGA driver from the CD ROM to a 1.44" diskette.
- Step 2: Open the Control Panel and double-click "SYSTEM" icon and then Click the "DEVICE Manager" Tab and double click "VGA Display".
- Step 3: Click on DRIVE from the menu bar and new screen appears with the "Update Driver" button and then system will search VGA drive file starting form A: drive.
- Step 4: As the installation is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done!

No, I will restart my computer later.

System must be restart then complete the installation.

- Step 5: In the WINDOWS98/ME, you can find the <DISPLAYL> icon located in the {CONTROL PANEL} group.
- Step 6: Adjust the <Refresh Rate>, <Font size> and <Resolution>.

**Note:** In the VGA/Audio/SysChip >Via8606>NT4.0, WINXP\_2K directory, a Install.txt file is included to provide installation information

## LAN Utility & Driver

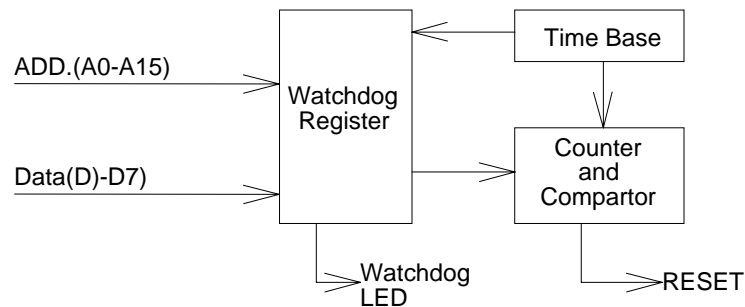
- 1 To install the LAN utility OR driver, insert the CD ROM into the CD ROM device, and enter DRIVER>LAN>RTL8139C. If your system is not equipped with a CD ROM device, copy the LAN VGA driver from the CD ROM to a 1.44" diskette.
- 2 Execute install.exe file.

**Note:** In the LAN directory, a HELPME.EXE file is included to provide installation information

## Watchdog Timer

This section describes how to use the Watchdog Timer, including disabled, enabled, and trigger functions.

The FX5600 is equipped with a programmable time-out period watchdog timer. You can use your own program to enable the watchdog timer. Once you have enabled the watchdog timer, the program should trigger the I/O every time before the timer times out. If your program fails to trigger or disable this timer before it times out, e.g. because of a system hang-up, it will generate a reset signal to reset the system.



### FX5600A

The CD-ROM includes a Watch Dog demo file. In the file, there are 3 execution programs written in different forms. The sub-directories of the file are:

1. WATCHDOG/ITE8712/ASSEMBLE: Library and Test Program written in Assembly Language
2. WATCHDOG/ITE8712/TURBOC: Library and Test Program written in Turbo C++

The WATCHDOG includes a demonstration program established for users who would like to configure the Watchdog timer by themselves.

**Note:** In the WATCHDOG directory, README.TXT file is included to provide demo program information.

### Watchdog Timer Setting

The watchdog timer is a circuit that may be used from your program software to detect system crashes or hang-ups. The green LED is located at the front side. Whenever the watchdog timer is enabled, the LED will blink to indicate that the timer is counting. The watchdog timer is automatically disabled after reset.

Once you have enabled the watchdog timer, your program must trigger the watchdog timer every time before it times out. After you trigger the watchdog timer, it will be set to non-zero value to watchdog counter and start to count down again. If your program fails to trigger the watchdog timer before time-out, it will generate a reset pulse to reset the system.

The factor of the watchdog timer time-out constant is approximately 1 seconds. The period for the watchdog timer time-out is between 1 to FF timer factors.

If you want to reset your system when watchdog times out, the following table listed the relation of timer factors between time-out periods.

Time Factor	Time-Out Period (Seconds)	Time-Out Period (Minutes)
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
"	"	"
"	"	"
"	"	"
FF	FF	FF



### Watchdog Timer Enabled

To enable the watchdog timer, you have to output a byte of timer factor to the watchdog. The following is a Turbo C++ program, which demonstrates how to enable the watchdog timer and set the time-out period at 6 seconds.

```
#include "stdio.H"
#include "WDLIB.H"

main()
{
char WD_TIME=0x6;

InitWD(equWdUnitS);
printf ("Enable watchdog");
//Trigger watchdog Timer Output is 6 seconds
EnWD(WD_TIME);
}
```

### Watchdog Timer Trigger

After you enable the watchdog timer, your program must write the same factor as enabling to the watchdog register at least once every time-out period to its previous setting. You can change the time-out period by writing another timer factor to the watchdog register at any time, and you must trigger the watchdog before the new time-out period in the next trigger. Below is a Turbo C++ program, which demonstrates how to trigger the watchdog timer:

```
#include "stdio.H"
#include "WDLIB.H"

main()
{
char WD_TIME=0x6;

InitWD(equWdUnitS);
printf ("Enable watchdog");
//Trigger watchdog Timer Output is 6 seconds
EnWD(WD_TIME);
}
```

### Watchdog Timer Disabled

To disable the watchdog timer, simply write a 00H to the watchdog register.

```
#include "stdio.H"
#include "WDLIB.H"

main( )
{
InitWD(equWdUnitS);
printf ("Disable Watch Dog");
//Disable watch dog
DisWD(WD_TIME);
}
```

### FX5600B

#### Watchdog Timer Setting

The factor of the watchdog timer time-out constant is approximately 6 seconds. The period for the watchdog timer time-out period is between 1 to 8 timer factors. If you want to reset your system when watchdog times out, the following table listed the relation of timer factors between time-out periods.

Reset Time Factor	IRQ 11 Time Factor	IRQ 15 Time Factor	Time-Out Period (Sec)
20h	38h	30h	3
21h	39h	31h	9
22h	3Ah	32h	15
23h	3Bh	33h	22
24h	3Ch	34h	28
25h	3Dh	35h	34
26h	3Eh	36h	40
27h	3Fh	37h	46

**Note:**

1. If you program the watchdog to generate IRQ15 signal when it times out, you should initial IRQ15 interrupt vector and enable the second interrupt controller (8259 PIC) in order to enable CPU to process this interrupt. An interrupt service routine is required too.
2. Before you initial the interrupt vector of IRQ15 and enable the PIC, please enable the watchdog timer previously; otherwise the watchdog timer will generate an interrupt at the time watchdog timer is enabled.

**Watchdog Timer Enabled**

To enable the watchdog timer, you have to output a byte of timer factor to the watchdog register whose address is 76H. The following is a BASICA program, which demonstrates how to enable the watchdog timer and set the time-out period at 28 seconds.

```

1000      REM Points to command register
1010      WD_REG% = 76hH
1020      REM Timer factor = 24H (or 34H)
1030      TIMER_FACTOR% = %H24
1040      REM Output factor to watchdog register
1050      OUT WD_REG%, TIMER_FACTOR%
```

**Watchdog Timer Trigger**

After you enable the watchdog timer, your program must write the same factor as enabling to the watchdog register at least once every time-out period to its previous setting. You can change the time-out period by writing another timer factor to the watchdog register at any time, and you must trigger the watchdog before the new time-out period in next trigger. Below is a BASICA program, which demonstrates how to trigger the watchdog timer:

```

2000      REM Points to command register
2010      WD_REG% = 76H
2020      REM Timer factor = 76H (or 34H)
2030      TIMER_FACTOR% = &H76
2040      REM Output factor to watchdog register
2050      OUT WD_REG%, TIMER_FACTOR%
```

. Etc.

**Watchdog Timer Disabled**

To disable the watchdog timer, simply write a 00H to the watchdog register.

```

3000      REM Points to command register
3010      WD_REG% = BASE_PORT%
3020      REM Timer factor = 0
3030      TIMER_FACTOR% = 0
3040      REM Output factor to watchdog register
3050      OUT WD_REG%, TIMER_FACTOR%
```

. Etc.

## Chapter 5 Error Coding

This section outlines the errors that may occur when you operate the system, and also gives you the suggestions on solving the problems.

Topic include:

- Trouble Shooting for Post Beep & Error Messages

### Trouble Shooting for Post Beep and Error Messages

The following information informs the Post Beep & error messages. Please adjust your systems according to the messages below. Make sure all the components and connectors are in proper position and firmly attached. If the errors still exist, please contact with your distributor for maintenance.

#### POST BEEP

Currently there are two kinds of beep codes in BIOS setup.

- One indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps.
- The other indicates that an error has occurred in your DRAM. This beep code consists of a constant single long beep.

#### CMOS BATTERY FAILURE

When the CMOS battery is out of work or has run out, the user has to replace it with a new battery.

### **CMOS CHECKSUM ERROR**

This error informs that the CMOS has corrupted. When the battery runs weak, this situation might happen. Please check the battery and change a new one when necessary.

### **DISK BOOT FAILURE**

When you can't find the boot device, insert a system disk into Drive A and press < Enter >. Make sure both the controller and cables are all in proper positions, and also make sure the disk is formatted. Then reboot the system.

### **DISKETTE DRIVES OR TYPES MISMATCH ERROR**

When the diskette drive type is different from CMOS, please run setup or configure the drive again.

### **ERROR ENCOUNTERED INITIALIZING HARD DRIVE**

When you can't initialize the hard drive, ensure the following things:

1. The adapter is installed correctly
2. All cables are correctly and firmly attached
3. The correct hard drive type is selected in BIOS Setup

### **ERROR INITIALIZING HARD DISK CONTROLLER**

When this error occurs, ensure the following things:

1. The cord is exactly installed in the bus.
2. The correct hard drive type is selected in BIOS Setup
3. Whether all of the jumpers are set correctly in the hard drive

### **FLOPPY DISK CONTROLLER ERROR OR NO CONTROLLER PRESENT**

When you cannot find or initialize the floppy drive controller, please ensure the controller is in proper BIOS Setup. If there is no floppy drive installed, ensure the Diskette Drive selection in Setup is set to NONE.

### **KEYBOARD ERROR OR NO KEYBOARD PRESENT**

When this situation happens, please check keyboard attachment and no keys being pressed during the boot. If you are purposely configuring the system without a keyboard, set the error halt condition in BIOS Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot procedure.

### **MEMORY ADDRESS ERROR**

When the memory address indicates error. You can use this location along with the memory map for your system to find and replace the bad memory chips.

### **MEMORY SIZE HAS CHANGED**

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

### **MEMORY VERIFYING ERROR**

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

### **OFFENDING ADDRESS MISSING**

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

### **REBOOT ERROR**

When this error occurs that requires you to reboot. Press any key and the system will reboot.

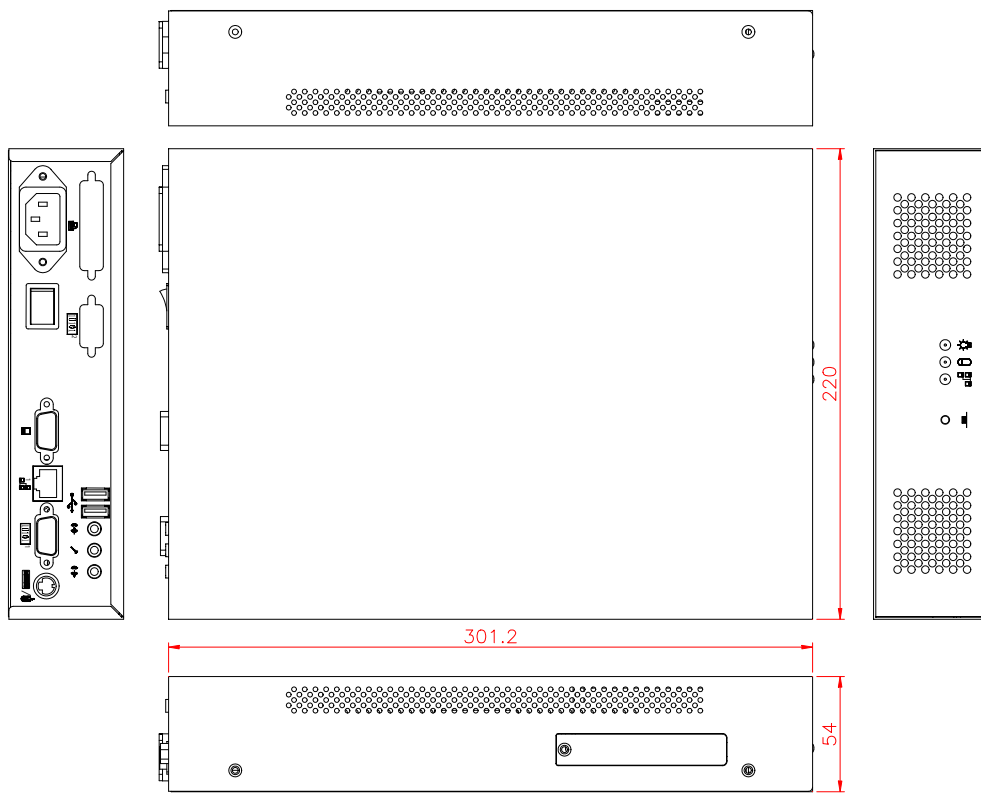
### **SYSTEM HALTED**

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



## Appendix

### Dimension





## Technical Reference

### Physical and Environmental

DC Inputs: 24V/0.8A Minimal

Temperature: Operating 0°C ~ 45°C

Relative humidity 5 % to 95 % non-condensing

Input AC Voltage Range: 85V~270V/0.7A, 50Hz ~60Hz

### Real-Time Clock and Non-Volatile RAM

The FX5600 contains a real-time clock compartment that maintains the date and time in addition to storing configuration information about the computer system. It contains 14 bytes of clock and control registers and 114 bytes of general purpose RAM. Because of the use of CMOS technology, it consumes very little power and can be maintained for long periods of time using an internal Lithium battery. The contents of each byte in the CMOS RAM are listed below:

Address	Description
00	Seconds
01	Second alarm
02	Minutes
03	Minute alarm
04	Hours
05	Hour alarm
06	Day of week
07	Date of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown status byte

Address	Description
10	Diskette drive type byte, drive A and B
11	Fixed disk type byte, drive C
12	Fixed disk type byte, drive D
13	Reserved
14	Equipment byte
15	Low base memory byte
16	High base memory byte
17	Low expansion memory byte
18	High expansion memory byte
19-2D	Reserved
2E-2F	2-byte CMOS checksum
30	Low actual expansion memory byte
31	High actual expansion memory byte
32	Date century byte
33	Information flags (set during power on)
34-7F	Reserved for system BIOS

**CMOS RAM Map**

Register	Description
00h -10h	Standard AT-compatible RTC and Status and Status Register data definitions
11h – 13h	Varies
14h	<p>Equipment</p> <p>Bits 7-6 Number of Floppy Drives            00 1 Drive            01 2 Drives</p> <p>Bits 5-4 Monitor Type            00 Not CGA or MDA 01 40x25 CGA            01 2 Drives 80x25 CGA</p> <p>Bits 3 Display Enabled            0 Disabled            1 Enabled</p> <p>Bit 2 Keyboard Enabled            00 Not CGA or MDA 01 40x25 CGA            01 2 Drives 80x25 CGA</p> <p>Bit 1 Math Coprocessor Installed            0 Absent            1 Present</p> <p>Bit 0 Floppy Drive Installed            0 Disabled            1 Enabled</p>
15h	Base Memory (in 1KB increments), Low Byte
16h	Base Memory (in 1KB increments), High Byte
17h	IBM-compatible memory (in 1KB increments), Low Byte
18h	IBM-compatible memory (in 1KB increments), High Byte (max 15 MB)
19h-2Dh	Varies
2Eh	Standard CMOS RAM checksum, high byte
2Fh	Standard CMOS RAM checksum, low byte
30h	IBM-compatible Extended Memory, Low Byte (POST) in KB
31h	IBM-compatible Extended Memory, High Byte (POST) in KB
32h	Century Byte
33h	Reserved. Do not use
34h	Reserved. Do not use
35h	Low byte of extended memory (POST) in 64 KB
36h	High byte of extended memory (POST) in 64 KB
37h-3Dh	Varies
3Eh	Extended CMOS Checksum, Low Byte (including 34h-3Dh)
3Fh	Extended CMOS Checksum, High Byte (including 34h-3Dh)

### I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. There is a total of 1K-port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 071h	Real Time Clock, NMI
078h - 07Bh	TTL I/O
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
2E8h - 2EFh	Serial Port #4(COM4)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3E8h - 3EFh	Serial Port #3(COM3)
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

### Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	AUDIO
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	LAN #1
IRQ11	LAN #2
IRQ12	PS2 Mouse
IRQ13	FPU
IRQ14	Primary IDE
IRQ15	USB

### DMA Channel Map

The equivalent of two 8237A DMA controllers are implemented in the FX5600 board. Each controller is a four-channel DMA device that will generate the memory addresses and control signals necessary to transfer information directly between a peripheral device and memory. This allows high speed information transfer with less CPU intervention. The two DMA controllers are internally cascaded to provide four DMA channels for transfers to 8-bit peripherals (DMA1) and three channels for transfers to 16-bit peripherals (DMA2). DMA2 channel 0 provides the cascade interconnection between the two DMA devices, thereby maintaining IBM PC/AT compatibility.

The following is the system information of DMA channels:

DMA Controller 1	DMA Controller 2
Channel 0: Spare	Channel 4: Cascade for controller 1
Channel 1: Reserved for IBM SDLC	Channel 5: Spare
Channel 2: Diskette adapter	Channel 6: Spare
Channel 3: Spare	Channel 7: Spare

## Serial Ports

The ACEs (Asynchronous Communication Elements ACE1 to ACE2) are used to convert parallel data to a serial format on the transmit side and convert serial data to parallel on the receiver side. The serial format, in order of transmission and reception, is a start bit, followed by five to eight data bits, a parity bit (if programmed) and one, one and half (five-bit format only) or two stop bits. The ACEs are capable of handling divisors of 1 to 65535, and produce a 16x clock for driving the internal transmitter logic.

Provisions are also included to use this 16x clock to drive the receiver logic. Also included in the ACE is a completed MODEM control capability, and a processor interrupt system that may be software tailored to the computing time required to handle the communications link.

The following table is a summary of each ACE accessible register

DLAB	Port Address	Register
0	Base + 0	Receiver buffer (read)
		Transmitter holding register (write)
0	Base + 1	Interrupt enable
X	Base + 2	Interrupt identification (read only)
X	Base + 3	Line control
X	Base + 4	MODEM control
X	Base + 5	Line status
X	Base + 6	MODEM status
X	Base + 7	Scratched register
1	Base + 0	Divisor latch (least significant byte)
1	Base + 1	Divisor latch (most significant byte)

### Receiver Buffer Register (RBR)

Bit 0-7: Received data byte (Read Only)

### Transmitter Holding Register (THR)

Bit 0-7: Transmitter holding data byte (Write Only)

### Interrupt Enable Register (IER)

Bit 0: Enable Received Data Available Interrupt (ERBFI)

Bit 1: Enable Transmitter Holding Empty Interrupt (ETBEI)

Bit 2: Enable Receiver Line Status Interrupt (ELSI)

Bit 3: Enable MODEM Status Interrupt (EDSSI)

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

**Interrupt Identification Register (IIR)**

Bit 0: "0" if Interrupt Pending

Bit 1: Interrupt ID Bit 0

Bit 2: Interrupt ID Bit 1

Bit 3: Must be 0

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

**Line Control Register (LCR)**

Bit 0: Word Length Select Bit 0 (WLS0)

Bit 1: Word Length Select Bit 1 (WLS1)

WLS1	WLS0	Word Length
0	0	5 Bits
0	1	6 Bits
1	0	7 Bits
1	1	8 Bits

Bit 2: Number of Stop Bit (STB)

Bit 3: Parity Enable (PEN)

Bit 4: Even Parity Select (EPS)



Bit 5: Stick Parity

Bit 6: Set Break

Bit 7: Divisor Latch Access Bit (DLAB)

**MODEM Control Register (MCR)**

Bit 0: Data Terminal Ready (DTR)

Bit 1: Request to Send (RTS)

Bit 2: Out 1 (OUT 1)

Bit 3: Out 2 (OUT 2)

Bit 4: Loop

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

**Line Status Register (LSR)**

Bit 0: Data Ready (DR)

Bit 1: Overrun Error (OR)

Bit 2: Parity Error (PE)

Bit 3: Framing Error (FE)

Bit 4: Break Interrupt (BI)

Bit 5: Transmitter Holding Register Empty (THRE)

Bit 6: Transmitter Shift Register Empty (TSRE)

Bit 7: Must be 0

**MODEM Status Register (MSR)**

Bit 0: Delta Clear to Send (DCTS)

Bit 1: Delta Data Set Ready (DDSR)

Bit 2: Training Edge Ring Indicator (TERI)

Bit 3: Delta Receive Line Signal Detect (DSLSD)

Bit 4: Clear to Send (CTS)

Bit 5: Data Set Ready (DSR)

Bit 6: Ring Indicator (RI)

Bit 7: Received Line Signal Detect (RSLD)

**Divisor Latch (LS, MS)**

	LS	MS
Bit 0:	Bit 0	Bit 8
Bit 1:	Bit 1	Bit 9
Bit 2:	Bit 2	Bit 10
Bit 3:	Bit 3	Bit 11
Bit 4:	Bit 4	Bit 12
Bit 5:	Bit 5	Bit 13
Bit 6:	Bit 6	Bit 14
Bit 7:	Bit 7	Bit 15

Desired Baud Rate	Divisor Used to Generate 16x Clock
300	384
600	192
1200	96
1800	64
2400	48
3600	32
4800	24
9600	12
14400	8
19200	6
28800	4
38400	3
57600	2
115200	1

### Parallel Ports

#### Register Address

Port Address	Read/Write	Register
Base + 0	Write	Output data
Base + 0	Read	Input data
Base + 1	Read	Printer status buffer
Base + 2	Write	Printer control latch

#### Printer Interface Logic

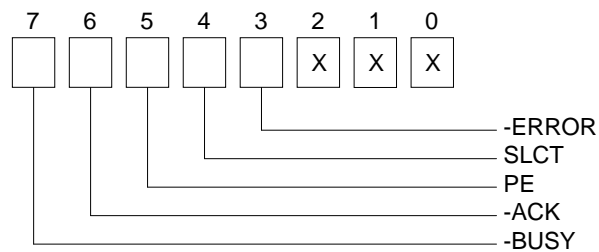
The parallel portion of the SMC37C669 makes the attachment of various devices that accept eight bits of parallel data at standard TTL level.

#### Data Swapper

The system microprocessor can read the contents of the printer's Data Latch through the Data Swapper by reading the Data Swapper address

#### Printer Status Buffer

The system microprocessor can read the printer status by reading the address of the Printer Status Buffer. The bit definitions are described below:

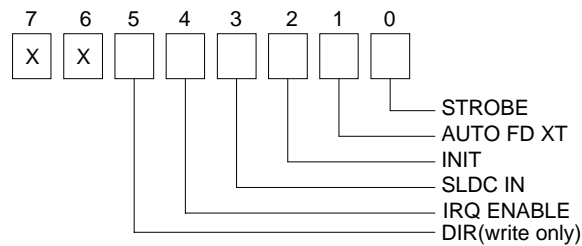


NOTE: X represents not used.

- Bit 7: This signal may become active during data entry, when the printer is off-line during printing, or when the print head is changing position or in an error state. When Bit 7 is active, the printer is busy and cannot accept data.
- Bit 6: This bit represents the current state of the printer's ACK signal. A 0 means the printer has received the character and is ready to accept another. Normally, this signal will be active for approximately 5 microseconds before receiving a BUSY message stops.
- Bit 5: A 1 means the printer has detected the end of the paper.
- Bit 4: A 1 means the printer is selected.
- Bit 3: A 0 means the printer has encountered an error condition.

### Printer Control Latch & Printer Control Swapper

The system microprocessor can read the contents of the printer control latch by reading the address of printer control swapper. Bit definitions are as follows:



NOTE: X represents not used.

- Bit 5: Direction control bit. When logic 1, the output buffers in the parallel port are disabled allowing data driven from external sources to be read; when logic 0 they work as a printer port. This bit is write-only.
  
- Bit 4: A 1 in this position allows an interrupt to occur when ACK changes from low state to high state.
  
- Bit 3: A 1 in this bit position selects the printer.
  
- Bit 2: A 0 starts the printer (50 microseconds pulse, minimum).
  
- Bit 1: A 1 causes the printer to line-feed after a line is printed.
  
- Bit 0: A 0.5 microsecond minimum highly active pulse clocks data into the printer. Valid data must be present for a minimum of 0.5 microseconds before and after the strobe pulse.