
Chapter 1

Overview

The AP5TC is a high-performance Pentium®-based system board that utilizes the PCI/ISA architecture and **Baby AT** form factor. It integrates the Intel **82430TX** PCIset, a Super I/O controller, and a PCI mode 4 enhanced IDE controller with bus master and **Ultra DMA/33** to enhance system performance. It has **512KB** pipelined-burst second-level **cache onboard** and support four single in-line memory module (SIMM) plus two Dual in-line memory module (DIMM) that allow to **mix EDO and SDRAM** memory and expansion up to a maximum of 256MB. For the memory and IDE performance, the Intel 430TX chipset is currently the **fastest Pentium chipset** in the market.

In addition, AP5TC also implements many special features as following.

Switching Power Regulator Although Linear Regulator is good enough for AMD K6, AP5TC uses switching regulator to reserve the upgrade capability for new generation CPU.

Over-current Protection AP5TC implements CPU core voltage 15A over-current protection to prevent any accident short circuit and prevent system damage.

CPU Thermal Protection When CPU temperature is higher than a predefined value, the CPU speed will automatically slow down and there will be warning from BIOS and also ADM (AOpen Desktop Manager, similar as Intel LDCM), if ADM is installed.

Full-range CPU core voltage This motherboard supports the CPU core voltage from 1.3V to 3.5V, that can be applied to various CPU type in future.

Resetable Fuse AP5TC implements resetable fuses to prevent any accidental short circuit caused by keyboard or USB devices hot plug.

PCI Sound Card connector The SB-LINK connector can be used to link Creative-compatible PCI sound card. If you have a Creative PCI sound card installed, it is necessary to link the card to this connector for compatibility issue under DOS environment.

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FCC DoC certificate The AP5TC has also passed **FCC DoC test**, this means you can use any kind of housing with very low EMI radiation.

Powerful utility softwares supported AOpen Bonus Pack bundled CD contains many useful utilities, such as ADM (Advanced Desktop Manager), AOchip, Hardware Monitor utility, AcePhone, EasyAxess, Suspend to Hard Drive utility, and BIOS flash utility.

1.1 Specifications

Form Factor	Baby AT
Board Size	220 mm x 250 mm
CPU	Intel Pentium Processor P54C, PP/MT (P55C), AMD K5/K6, Cyrix 6x86 and IDT C6.
System Memory	FPM (Fast Page Mode) or EDO (Extended Data Output) 72-pin SIMM x4, and SDRAM 168-pin x2 maximum 256MB.
Second-level Cache	256KB or 512KB pipelined-burst cache onboard.
Chipset	Intel 82430TX PCIset
Expansion Slots	ISA x3 and PCI x4
Serial Port	Two serial ports UART 16C550 compatible, and the 3rd UART for IR function.
Parallel Port	One parallel port supports standard parallel port (SPP), enhanced parallel port (EPP) or extended capabilities port (ECP).
Floppy Interface	Floppy interface supports 3.5 inches drives with 720KB, 1.44MB or 2.88MB format or 5.25 inches drives with 360KB, 1.2MB format.
IDE Interface	Dual-channel IDE interface support maximum 4 IDE hard disks or CDROM, mode 4, bus master hard disk drives and Ultra DMA/33 mode hard drives are also supported.
USB Interface	Two USB ports supported by USB bracket, the BIOS also supports USB driver to simulate legacy keyboard.
PS/2 Mouse	PS/2 mouse supported by PS/2 mouse bracket.
Keyboard	Default AT compatible keyboard, mini-DIN PS/2 keyboard connector is optional.
RTC and Battery	RTC build in Intel PIIX4 chipset, Lithium (CR-2032) battery.
BIOS	AWARD Plug-and-Play Flash ROM BIOS

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Suspend to Hard Drive	Supported by BIOS, save your work to hard disk and resume within a very short time. VESA compatible VGA and Sound Blaster compatible sound card required.
Switching Regulator	High efficient switching regulator for future CPU.
Over-current Protection	CPU core voltage 15A over-current protection to prevent any accident short circuit.
CPU Thermal Protection	Warning when CPU temperature is higher than the predefined value.
SB-LINK connector supported	The SB-LINK connector can be used to link Creative PCI sound card.

1.2 Suspend to Hard Drive

Suspend to Hard Drive saves your current work (system status, memory and screen image) into hard disk, and then the system can be totally power off. Next time, when power is on, you can resume your original work directly from hard disk within few second without go through the Win95 booting process and run your application again. If your memory is 16MB, normally, you need to reserve at least 16MB HDD space to save your memory image. Note that you have to use VESA compatible PCI VGA (AOpen PV70/PT70), Sound Blaster compatible sound card and sound driver that supports APM (AOpen AW35 or MP56) for Suspend to Hard Drive to work properly. Of course, we recommend to use AOpen products for best compatibility.

Although Suspend to Hard Drive is so powerful, it is actually a little complicated to set up this function. To use Suspend to Hard Drive, please make sure you have read the following in detail.

1. Go into BIOS setup, Power Management à Suspend Mode Option, select "Suspend to Disk".
2. Go into BIOS setup, PNP/PCI Configuration à PnP OS Installed, select "No". This can give BIOS the capability to allocate system resources for Suspend to Hard Drive.
3. Bootup your system into DOS command prompt. If you are Win'95 user, Please restart your Windows 95 under "Command Prompt" by pressing "F8" while system shows "Windows 95 Starting ...". Choose "Safe Mode Command Prompt Only" from selection so that system will start in DOS command prompt.
4. Copy AOZVHDD.EXE to the root directory of your C: drive.
5. **Option 1: Use /file switch (applied to FAT16 file system):**

Please use following command to create a hidden file in the root directory of your hard disk for Suspend to Hard Drive to save the system status and memory image.

```
C:>AOZVHDD /c /file
```

Please make sure that you have enough continuous HDD space for creating this hidden file. For example, if you have 32MB of system memory and 4MB of VGA memory, you need at least 36MB (32MB + 4MB) of continuous HDD space. If AOZVHDD failed to allocate the HDD space, you may run "DEFRAG" Utility or "Disk Defragmenter" which come with MS-DOS or Win'95 to free HDD space.

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Option2: Use /partition switch (applied to FAT16/FAT32 file system):

To create a separate partition for Suspend to Hard Drive, please make sure you have allocated a free partition. We suggest you reserve the free partition which space is appropriate for your future memory expansion. For example, if you have 32MB of system memory and 4MB of VGA memory currently, but you plan to upgrade system memory to 64MB in the near future, then you may reserve a 68MB (64MB+4MB) space by using a disk utility (such as fdisk). Next, use following command to create a suspend partition:

```
C:>AOZVHDD /c /partition
```

If there is no extra free partition and you don't want your data lost, please do not use this partition method.

6. After creating above partition or hidden file, please reboot your system.
7. Push suspend switch (momentary mode) or use Win95 Suspend icon to force system goes into Suspend to Hard Drive mode and then turn system power off by power switch of your power supply.
8. Next time when you turn on your system, it will resume to your original work automatically.



Warning: Note that Intel Bus Master and Ultra DMA/33 IDE driver are not fully compatible with Suspend to Hard Drive function, installing these drivers may cause the system unstable. Under this situation, please uninstall the drivers.

Warning: This function does not support SCSI hard disks.

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Tip: Following VGA card have been tested & recognized as VESA compatible VGA device.

AOpen PV90 (Trident 9680)

AOpen PT60 (S3 Virge/BIOS R1.00-01)

AOpen PV60 (S3 Tiro64V+)

AOpen PT70 (S3 Virge/DX)

ProLink Trident GD-5440

ProLink Cirrus GD-5430

ProLink Cirrus GD-5446

ATI Mach 64 GX

ATI 3D RAGE II

Diamond Stealth64D (S3 868)

Diamond Stealth64V (S3 968)

KuoWei ET-6000.



Tip: Following Sound card have been tested OK for Suspend to Hard Drive.

AOpen AW32

AOpen AW35

AOpen MP56

Creative SB 16 Value PnP

Creative SB AWE32 PnP

ESS 1868 PnP

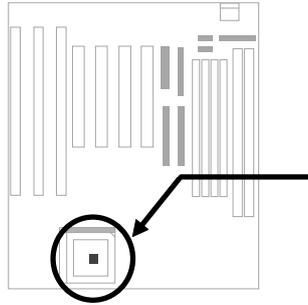
If your sound card can not work after resume from Suspend to Hard Drive, check your sound card vendor see if there is driver to support APM, and install it again.



Note: The USB function has not been tested for Suspend to Hard Drive. If you find any unstable problem, please go into BIOS, Integrated Peripherals à USB Legacy Support. Disable the USB Legacy function.

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1.3 CPU Thermal Protection

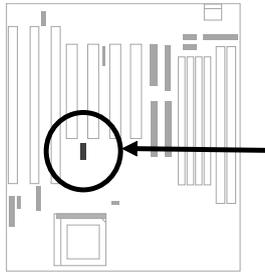


This motherboard implements special thermal protection circuit below the CPU. When temperature is higher than a predefined value, the CPU speed will automatically slow down and there will be warning from BIOS and also ADM (AOpen Desktop Manager, similar as Intel LDCM) or Hardware Monitor utility software.

ADM is a very powerful network and hardware monitor software. If you do not need network monitor function, you may also use Hardware Monitor utility, which is a small utility for hardware monitoring. Both ADM and Hardware Monitor utility are available on the bundled CD and our web site (<http://www.aopen.com.tw>).

CPU Thermal Protection is automatically implemented by BIOS and utility software, no hardware installation is needed.

1.4 PCI Sound Card connector



AP5TC implements a SB-LINK connector to support Creative-compatible PCI sound card. If you have a Creative-compatible PCI sound card installed, it is necessary to link the card to SB-LINK connector for compatibility issue under DOS environment.