HiCORE-i9451

Full Size Core 2 Duo/ Pentium D LGA775 SBC

User's Manual

Version 1.0

2007.07

Table of Contents

Chapter 1

Introduction

1.1 Copyright Notice

1.2 About this User's Manual

This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this User's Manual, please consult your vendor before further handling.

1.3 Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system

1.4 Replacing the lithium battery

Incorrect replacement of the lithium battery may lead to a risk of explosion. The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.
Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local requlations concerning special waste.

1.5 Technical Support

If you have any technical difficulites, please consult the user's manual first at:

ftp://ftp.arbor.com.tw/pub/manual

Please do not hesitate to call or e-mail our customer service when you still can not find out the answer.

http://www.arbor.com.tw
E-mail:info@arbor.com.tw

1.6 Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantibility and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

1.7 Packing List

1x HiCORE-i9451 Full Size Intel Pentium D LGA775 SBC

1x 6-in-1 cable kits (CBK-06-9451-00)

1x CD-ROM (For Driver used)

1x Quick Installation Guide

If any of the above items is damaged or missing, contact your vendor immediately.

1.8 Ordering Information

HiCORE-i9451VLG (R2.0)	Full-Size Intel LGA775 Core 2 Duo SBC with CRT, SATA, PCI-Express Gigabit LAN
HiCORE-i9451VLG (R1.0)	Full-Size Intel LGA775 Pentium D SBC with CRT, SATA, PCI-Express Gigabit LAN
FCDB-1110	ALC655 Audio board with bracket
FCDB-1225	DVI/ TV/ VGA daughter board with Bracket
FCDB-1293	4 x COM/ DIO (60.20 x 46.00 mm)

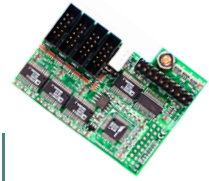
FCDB-1110

ALC655 Audio daughter board

FCDB-1225

DVI/ TV/ VGA daughter board

FCDB-1293

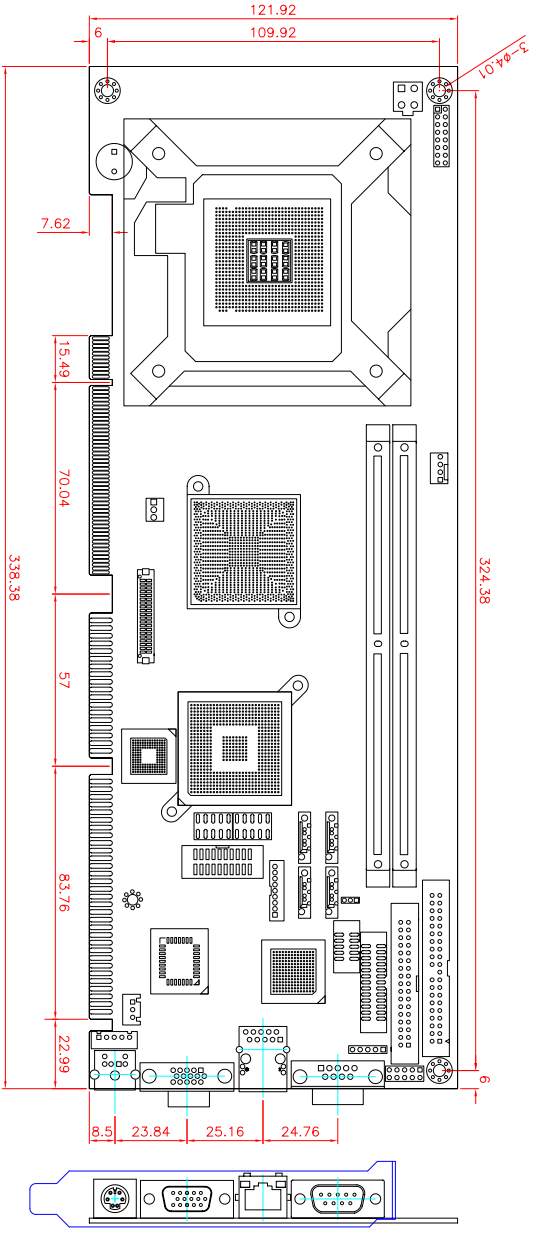


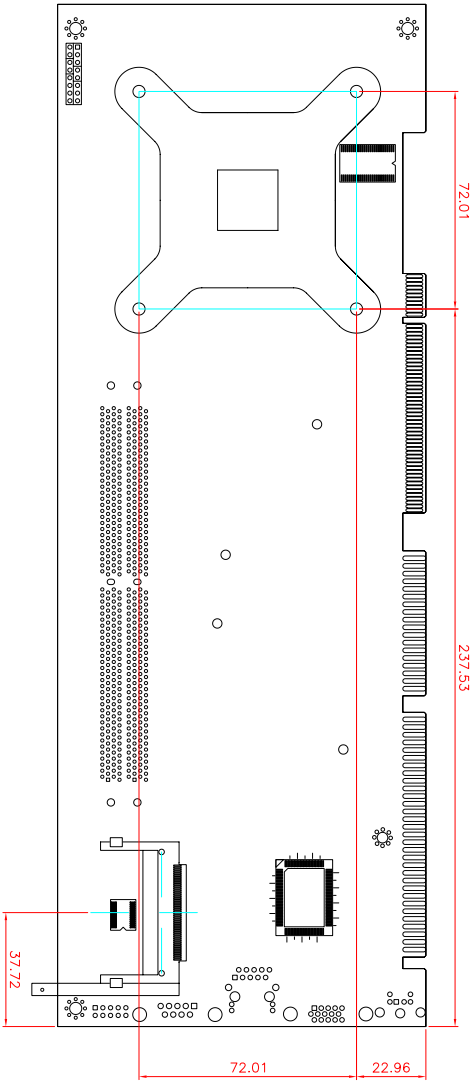
4 x COM/ DIO daughter board

1.9 Specification

Form Factor	Full Size LGA775 SBC
Processor	Intel Core 2 Duo/ Pentium D/ Celeron D/ Pentium 4 processor LGA775 socket, w/ 1066/800/533MHz FSB, w/ HT
Chipset	Intel 945G + Intel ICH7
System Memory	♦ 2 x 240-pin DIMM socket up to 2GB ♦ Dual Channel DDR2 667/533/400MHz SDRAM, supports Non-ECC memory only
VGA/ LCD Controller	Intel® Graphics Media Accelerator (GMA) 950 graphics core w/ CRT (Dual independent display) and DVI (by FCDB-1225)
Ethernet	1 x 82573V 100/1000 base-T PCI-Express Gigabit LAN
I/O Chips	WINBOND W83627HG
BIOS	4MB Phoenix-Award BIOS
Audio	AC'97 2.3 Codec, MIC-in/Line-in/Line-out (by FCDB-1110)
Serial ATA	4 x Serial ATA II with 300MB/s
IDE Interface	1 x Ultra DMA 100, support 2 IDE drives
Flash Disk	1 x Type II CompactFlash
Serial Port	2 x COM port (RS-232)
Expansion COM + DIO	4 x COM + 16-bit DIO (FCDB-1293)
Parallel Port	1 x SPP/EPP/ECP mode
FDD	1 x Floppy connector
KBMS	1 x 6-pin Mini-DIN KBMS
Universal Serial Bus	6 x USB 2.0 (by pin header)
Expansion Interface	16-bit ISA + 32-bit PCI (doesn't support ISA master bus device)
Hardware Monitor Chip	♦ CPU/System temperature and over heat Alarm ♦ 12V/5V/3.3V/Vcore/Vbat/5Vsb/3.3Vsb Voltage ♦ CPU/System Fan speed ♦ CPU over heat Protection
RTC	Real Time Clock
Power Input Connector	+12V 4 pin ATX Power Connector
Operating Temp.	0ºC - 50ºC
Watchdog Timer	255-level Reset
Dimension (L x W)	338 x 122mm (13.3" x 4.8")

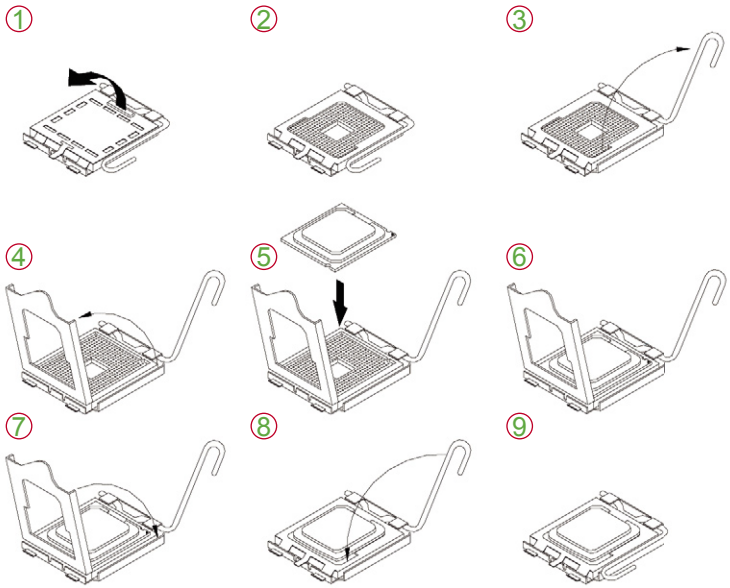
1.10 Board Dimensions




72.01
237.53
37.72
72.01
22.96

1.11 Installing the CPU

The LGA 775 processor socket comes with a lever to secure the processor. Please refer to the pictures step by step as below.
Please note that the cover of the LGA775 socket must always be installed during transport to avoid damage to the socket.

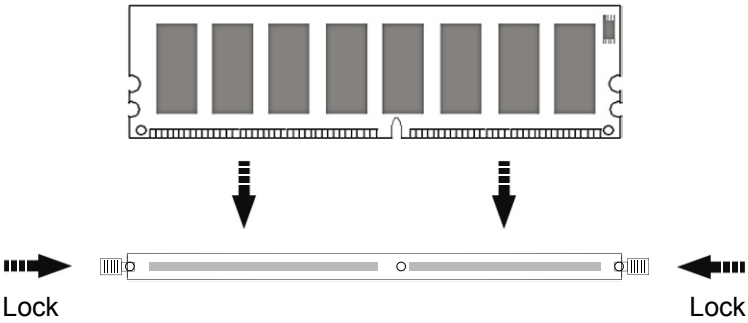


Make sure that heat sink of the CPU top surface is in complete contact to avoid the CPU overheating problem.
If not, it would cause your system or CPU to be hanged, unstable, damaged.

1.12 Installing the Memory

To install the Memory module, locate the Memory DIMM slot on the board and perform as below:

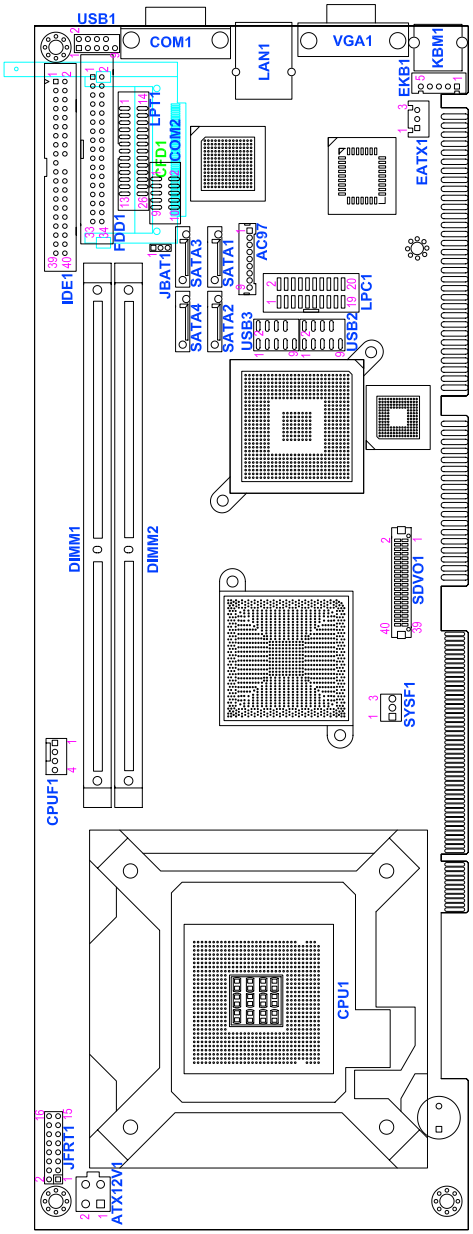
1. Hold the Memory module so that the key of the Memory module align with those on the Memory DIMM slot.
2. Gently push the Memory module in an upright position and a right way until the clips of the DIMM slot close to lock the Memory module in place, when the Memory module touches the bottom of the DIMM slot.
3. To remove the Memory module, just pressing the clips of DIMM slot with both hands.



Chapter 2

Installation

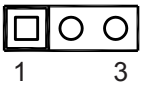
2.1 Jumpers and Connectors



Jumpers

2.2 JBAT1: CMOS Setup

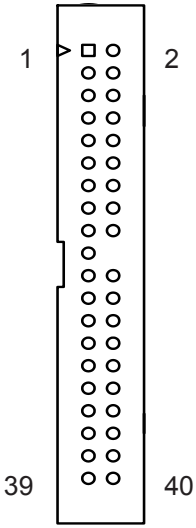
Pin	Mode
1-2	Keep CMOS (Default)
2-3	Clear CMOS



Connectors

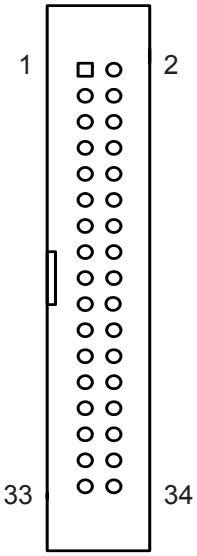
2.3 IDE1: Primary 40-pin IDE Connector

Pin	Description	Pin	Description
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N/C
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO READY	28	IDESEL
29	DACK	30	GND
31	IRQ14	32	N/C
33	ADDR1	34	ATA66 DETECT
35	ADDR0	36	ADDR2
37	#CS0	38	#CS1(#HD SELET1)
39	IDEACTP	40	GND



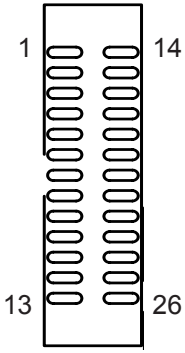
2.4 FDD1: FDD Connector

Pin	Description	Pin	Description
1	GND	2	DRVDEN0
3	GND	4	N/C
5	GND	6	DRVDEN1
7	GND	8	-INDEX
9	GND	10	-MOA
11	GND	12	-DSB
13	GND	14	-DSA
15	GND	16	-MOB
17	GND	18	-DIR
19	GND	20	-STEP
21	GND	22	-WDATA
23	GND	24	-WGATE
25	GND	26	-TRACK0
27	GND	28	-WP
29	GND	30	-RDATA
31	GND	32	-HEAD
33	GND	34	-DSKCHG



2.5 LPT1: Parallel Port Connector

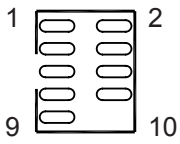
Pin	Description	Pin	Description
1	STROBE	14	AFD
2	PTD0	15	ERROR
3	PTD1	16	INIT
4	PTD2	17	SLIN
5	PTD3	18	GND
6	PTD4	19	GND
7	PTD5	20	GND
8	PTD6	21	GND
9	PTD7	22	GND
10	ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT	26	N/C



2.6 USB1/ USB2/ USB3: USB Connector

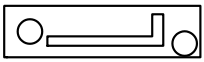
USB1/ USB2/ USB3 supports two USB 2.0 w/ 480MB/s by pin header

Pin	Description	Pin	Description
1	+5V	2	+5V
3	USBD-	4	USBD-
5	USBD+	6	USBD+
7	GND	8	GND
9	GND	10	N/C



2.7 SATA1/ 2/ 3/ 4: Serial ATA 1, 2, 3, 4 Connector

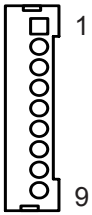
High speed transfer rates (300MB/sec)



2.8 AC97: Audio Daughterboard Connector

AC97 supports SCDB-1110 daughter board

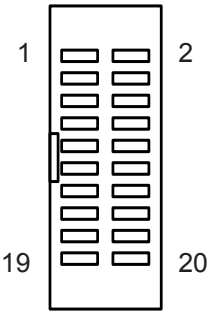
Pin	Description
1	+12V
2	+3.3V
3	AC_SYNC
4	AC_SDOUT
5	GND
6	AC_BITCLK
7	GND
8	AC_RST-
9	AC_SDIN0



2.9 LPC1: External Low Pin Count Connector

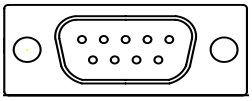
LPC1 supports SCDB-1293 daughter board

Pin	Description	Pin	Description
1	+5V	2	+5V
3	LDRQ-	4	LFRAME-
5	SERIRQ	6	GND
7	LAD2	8	LAD3
9	LAN0	10	LAD1
11	PCIRST-	12	GND
13	SMBUS DATA	14	33MHZ CLOCK
15	GND	16	SMBUS CLOCK
17	48MHZ CLOCK	18	LPC PME-
19	+3.3V	20	+3.3V



2.10 COM1: RS232 Connector

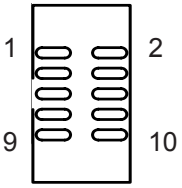
Pin	Description	Pin	Description
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND1	6	DSR1
7	RTS1	8	CTS1
9	RI1		



COM1

2.11 COM2: RS232 Connector

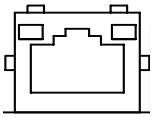
Pin	Description	Pin	Description
1	DCD2	2	RXD2
3	TXD2	4	DTR2
5	GND2	6	DSR2
7	RTS2	8	CTS2
9	RI2	10	N/C



COM2

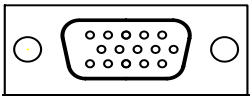
2.12 LAN1: 10/100/1000 RJ-45

LAN1 supports 10/100/1000 Mbps Fast Ethernet



LAN1

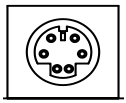
2.13 VGA1: CRT Display



CRT

2.14 KBM1: PS/2 Keyboard & Mouse

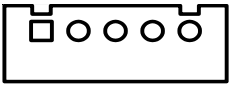
Standard Mini-Din PS/2 Keyboard & Mouse connector



KBMS

2.15 EKB1: External Keyboard Connector

Pin	Description
1	KB_DAT
2	KB_CLK
3	N/A
4	KB_GND
5	KB_VCC



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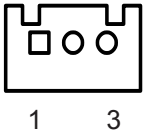
2.16 EATX1: ATX Feature Connector

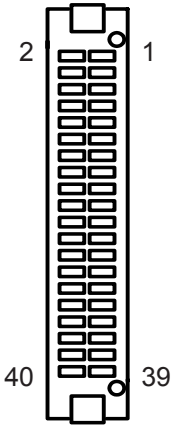
Pin	Description
1	PS-ON
2	GND
3	5V_SB



2.17 SDVO1: SDVO Daughterboard Connector

SDVO1 supports FCDB-1225 daughter board

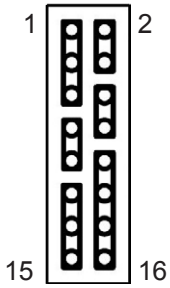
Pin	Description	Pin	Description
2	+5V	1	+5V
4	SDVOB_CLK+	3	SDVOB_R+
6	SDVOB_CLK-	5	SDVOB_R-
8	GND	7	GND
10	SDVOB_INT+	9	SDVOB_G+
12	SDVOB_INT-	11	SDVOB_G-
14	GND	13	GND
16	CRTLCLK	15	SDVOB_B+
18	CRTLDATA	17	SDVOB_B-
20	+3.3V	19	GND
22	+3.3V	21	RESET
24	SDVOC_CLK+	23	SDVOC_R+
26	SDVOC_CLK-	25	SDVOC_R-
28	GND	27	GND
30	SDVO_TVCLK+	29	SDVOC_G+
32	SDVO_ TVCLK -	31	SDVOC_G-
34	GND	33	GND
36	SDVO_STALL+	35	SDVOC_B+
38	SDVO_STALL-	37	SDVOC_B-
40	+2.5V	39	+2.5V



2.18 JFRT1: Switches and Indicators

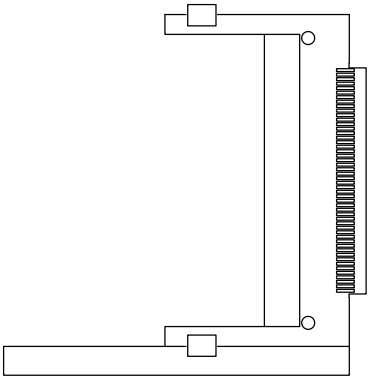
It provides connectors for system indicators that provides light indication of the computer activities and switches to change the computer status.

Pin	Description	Pin	Description
1	Power LED+	2	PWRBTN+
3	GND	4	PWRBTN-
5	GND	6	RESET+
7	HDD LED+	8	RESET-
9	HDD LED-	10	SPEAKER+
11	SMBCLK	12	SPEAKER+
13	SMBDATA	14	SPEAKER-
15	GND	16	SPEAKER-



2.19 CFD1: CompactFlash II Socket

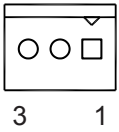
After hot-swapping CF II, you must retart your system for device detecting. Default setting: IDE slave.



2.20 SYSF1: System Fan Power Connector

SYSF1 is a 3-pin header for the system fan. The fan must be a 12V fan.

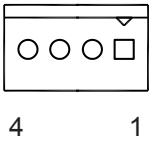
Pin	Description
1	GND
2	+12V
3	FAN_CTL



2.21 CPUF1: CPU Fan Power Connector

CPUF1 is a 4-pin header for the CPU fan. The fan must be a 12V fan.

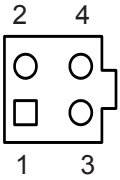
Pin	Description
1	GND
2	+12V
3	Fan_ DETECT
4	Fan Speed Control



2.22 ATX12V1: CPU Power Connector

ATX12V1 supplies the CPU operation ATX 12V (Vcore).

Pin	Description
1	GND
2	GND
3	+12V
4	+12V

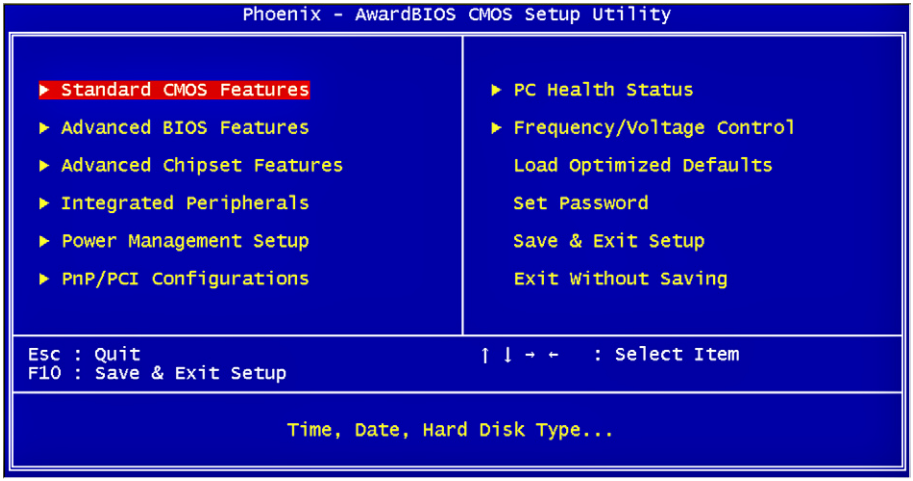


Chapter 3

BIOS

3.1 BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's. The BIOS provides for a standard device such as disk drives, serial ports and parallel ports. It also adds password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.



3.2 BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility.

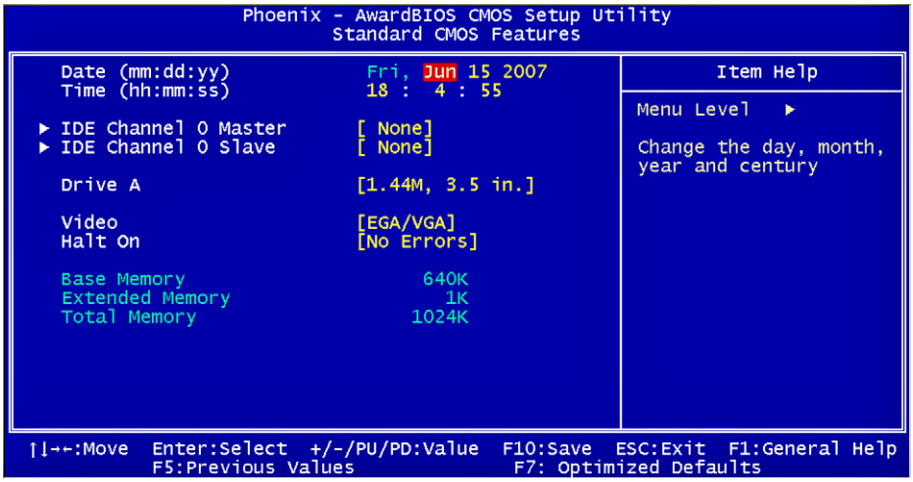
When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you a little bit late press the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again.

The following message will appear on the screen:

Press <DEL> to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit. When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

3.3 Standard CMOS Features



"Standard CMOS Features" allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the CPU card is already installed in a working system, you will not need to select this option.
You will need to run the Standard CMOS option, however, if you change your system hardware configurations, shch as onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Date

The date format is:

Day : Sun to Sat
Month : 1 to 12
Date : 1 to 31
Year : 1999 to 2099

Time

The time format is:

Hour : 00 to 23
Minute : 00 to 59
Second : 00 to 59

To set the date & time, highlight the "Date" & "Time" and use the <PgUp>/<PgDn> or +/- keys to set the current time.

IDE Channel 0 Master/ Slave

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices.
Each channel can support up to two hard disks; the first is the “Master” and the second is the “Slave”.
Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select ‘Manual’ to define the drive information manually. You will be asked to enter the following items.

Cylinder:	Number of cylinders
Head:	Number of read/write heads
Precomp:	Write precompensation
Landing Zone:	Landing zone
Sector:	Number of sectors

The Access Mode selections are as follows:

CHS	(HD < 528MB)
LBA	(HD > 528MB and supports Logical Block Addressing)
Large	(for MS-DOS only)
Auto	

Drive A

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

None	360K, 5.25 in.	1.2M, 5.25 in.
720K, 3.5 in.	1.44M, 3.5 in.	2.88M, 3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

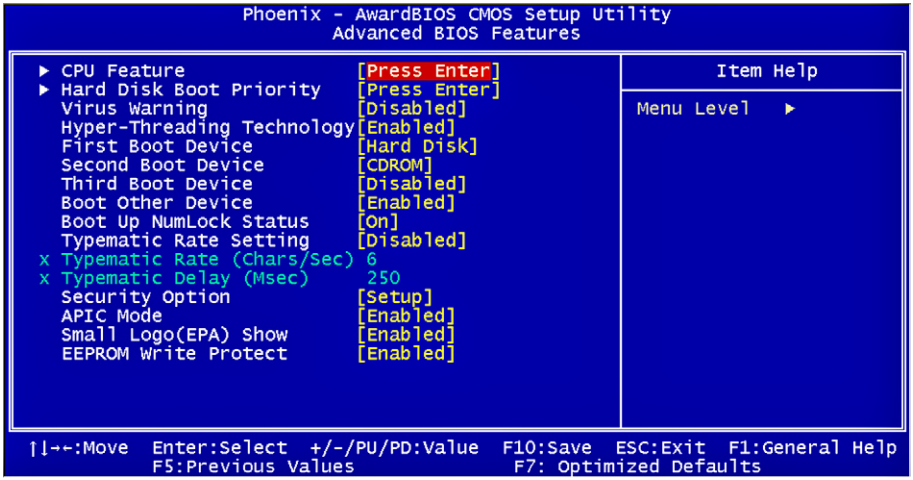
EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

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

3.4 Advance BIOS Features



CPU Feature

Press Enter to configure the settings relevant to CPU Feature.

Hard Disk Boot Priority

It allows you to set the priority for hard disk boot. When you press enter, the selections shows the current hard disks used in your system as well as the “Bootable Add-in Card” that is relevant to other boot sources media such as SCSI cards and LAN cards.

Virus Warning

If enabled, an alarm message will be displayed when trying to write on the boot sector or on the partition table on the disk, which is typical of the virus.

Hyper-Threading Technology

If enabled, when your processor supports Hyper-Threading Technology.

First/ Second/ Third Boot Device

These fields determine the drive that the system searches first for an operating system. The options available include
Setting: Floppy, LS120, Hard Disk, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, LAN and Disabled.

Boot Other Device

It allows the system to search for an OS from other devices other than the ones selected in the First/ Second/ Third Boot Device.
Setting: Disabled, Enabled (Default).

Boot Up NumLock Status

It allows you to activate the NumLock function after you power up the system.
Setting: Off, On (Default).

Typematic Rate Setting

When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed at the next.
Setting: Disabled (Default), Enabled.

Typematic Rate (Chars/Sec)

When the typematic rate is enabled, the system registers repeated keystrokes speeds.
Setting: 6 to 30 characters per second.

Typematic Delay (Msec)

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters.
Setting: 250 (Default), 500, 750, 1000.

Security Option

It allows you to limit access to the System and Setup.
When you select System, the system prompts for the User Password every time you boot up.
When you select Setup, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.
Setting: Setup (Default), System.

APIC Mode

APIC stands for Advanced Programmable Interrupt Controller.
Setting: Disabled, Enabled (Default).

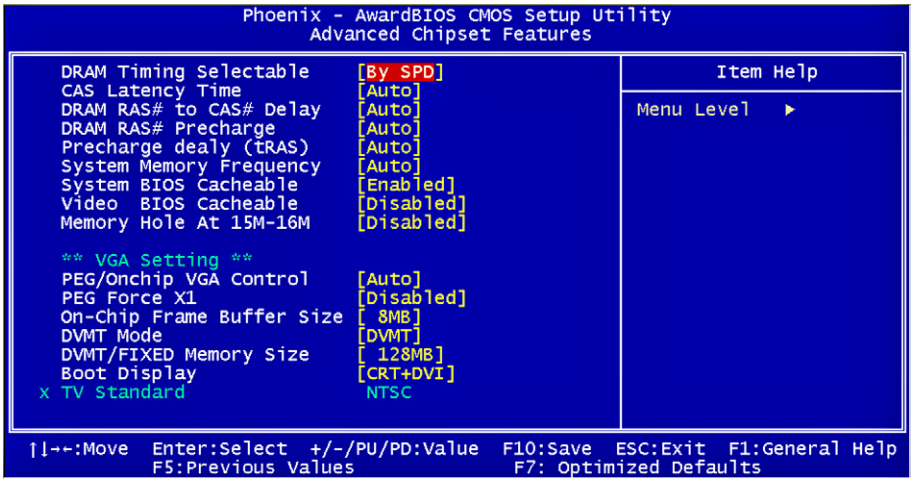
Small Logo(EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up.
Setting: Disabled, Enabled (Default).

EEPROM Write Protect

Setting: Disabled, Enabled (Default).

3.5 Advanced Chipset Features



DRAM Timing Selectable

It refers to the method by which the DRAM timing is selected.
Setting: Manual, By SPD (Default).

CAS Latency Time

It allows CAS latency time in HCLKs as 5, 4, 3, 6 and Auto. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or CPU.
Setting: 5, 4, 3, 6, Auto (Default).

DRAM RAS# to CAS# Delay

It allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.
Setting: 2, 3, 4, 5, 6, Auto (Default).

DRAM RAS# Precharge

It sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes.
Setting: 2, 3, 4, 5, 6, Auto (Default).

Precharge Delay (tRAS)

Setting: Auto (Default), 4 - 15.

System Memory Frequency

It allows you to set the frequency of the DRAM memory
Setting: Auto (Default), 533MHz, 667MHz.

System BIOS Cacheable

The setting of Enabled allows caching of the system BIOS ROM at F000h-FFFFFh for better system performance. However, if any program writes to this memory area, a system error may result.
Setting: Disabled, Enabled (Default).

Video BIOS Cacheable

The Setting Enabled allows caching of the video BIOS ROM at C0000h-F7FFFh for better video performance. However, if any program writes to this memory area, a system error may result.
Setting: Disabled (Default), Enabled.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB.
Setting: Disabled (Default), Enabled.

PEG/Onchip VGA Control

Setting: Onchip VGA, PEG Port, Auto (Default).

PEG Force X1

Setting: Disabled (Default), Enabled.

On-Chip Frame Buffer Size

Setting: 1MB, 8MB (Default).

DVMT Mode

Setting: FIXED, DVMT (Default), Both.

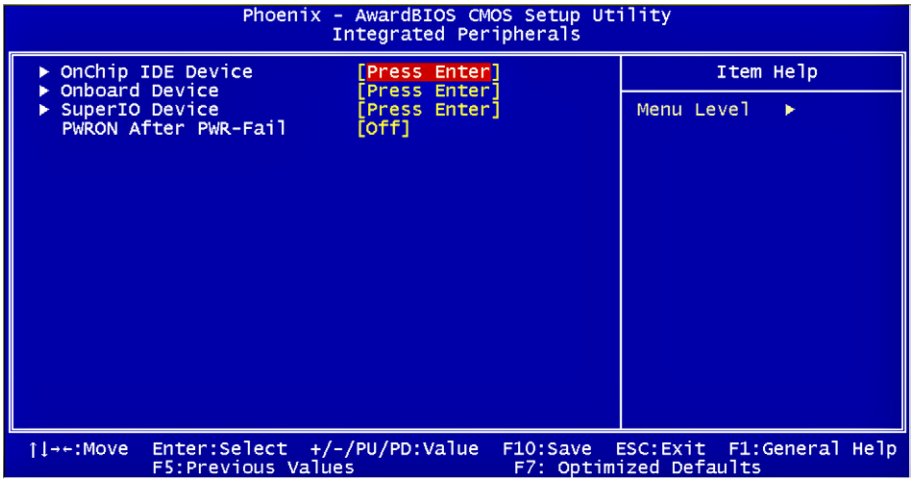
DVMT/FIXED Memory Size

Setting: 64MB, 128MB (Default), 224MB.

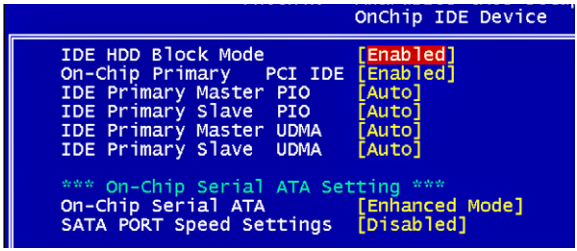
Boot Display

Setting: CRT, DVI, TV, CRT+DVI (Default).

3.6 Integrated Peripherals



OnChip IDE Device >>>



IDE HDD Block Mode

It allows HDD controller to use the fast block mode to transfer data to and from HDD.
Setting: Disabled, Enabled (Default).

On-Chip Primary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.
Setting: Disabled, Enabled (Default).

IDE Primary Master/Slave PIO

It allows your system HDD controller to run faster.
Rather than having the BIOS issue with a series of commands that transferring to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.
When Auto is selected, the BIOS will select the best available mode.
Setting: Auto (Default), Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary Master/Slave UDMA

It allows your system to improve disk I/O throughput to 33MB/sec with the Ultra DMA33 feature.
Setting: Disabled, Auto.

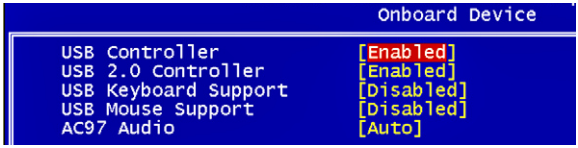
On-Chip Serial ATA

Setting:	Disabled	Disabled SATA controller
	Enhanced Mode (Default)	Enable both SATA and PATA. Max. of 6 IDE drivers are supported.

SATA PORT Speed Settings

Setting: Disabled (Default), Force GEN I, Force GEN II.

Onboard Device >>>



USB Controller

Setting: Enabled (Default), Disabled.

USB 2.0 Controller

For using USB 2.0, it is necessary OS drivers must be installed first. Please update your system to at least Windows 2000 SP4 or Windows XP SP2.
Setting: Enabled (Default), Disabled.

USB Keyboard Support

Setting: Disabled, Enabled (Default).

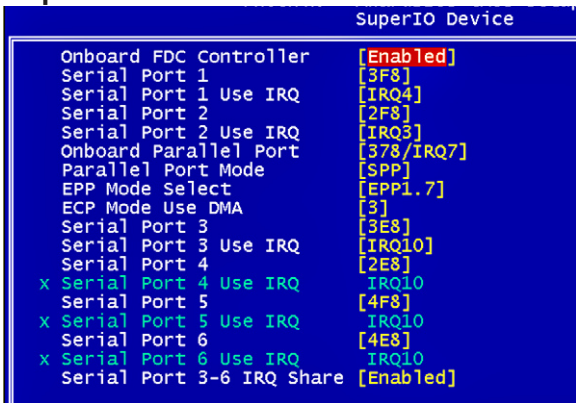
USB Mouse Support

Setting: Disabled, Enabled (Default).

AC97 Audio

Setting: Auto (Default), Disabled.

SuperIO Device >>>



Onboard FDC Controller

Select “Enabled” if your system has a floppy disk controller (FDC) installed and you wish to use it. Select “Disabled” if your system has an add-in FDC or has no floppy drive.
Setting: Disabled, Enabled (Default).

Onboard Serial/Parallel Port

It allows you to select the onboard serial and parallel ports with their addresses.

Setting:	Serial Port 1	3F8/IRQ4	(Default)
	Serial Port 2	2F8/IRQ3	(Default)
	Serial Port 3	3E8/IRQ10	(Default)
	Serial Port 4	2E8	(Default)
	Serial Port 5	4F8	(Default)
	Serial Port 6	4E8	(Default)
	Parallel Port	378/IRQ7	(Default)

Parallel Port Mode

Setting: SPP (Default)
EPP
ECP
ECP+EPP
Normal

EPP Mode Select

Setting: EPP1.9, EPP1.7 (Default)

ECP Mode Use DMA

Setting: 1, 3 (Default).

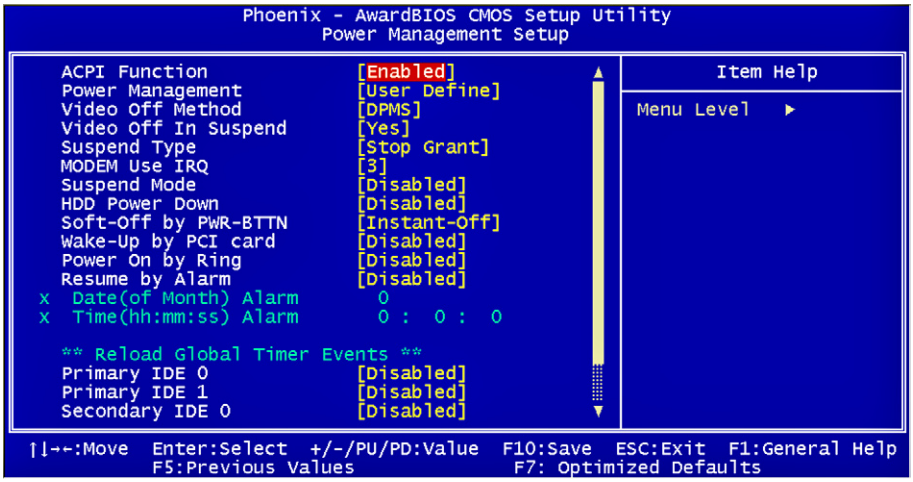
Serial Port 3-6 IRQ Share

Setting: Enabled (Default), Disabled.

PWRON After PWR-Fail

It sets the system power status whether on or off when power returns to the system from a power failure situation.
Setting: Off (Default), On, Former-Sts.

3.7 Power Management Setup



ACPI Function

It supports ACPI (Advance Configuration and Power Interface).
Setting: Enabled (Default), Disabled.

Power Management

It allows you to select the type of power saving management modes.

Setting:	User Define (Default)	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min
	Min Saving	Minimum power management
	Max Saving	Maximum power management

Video Off Method

It defines the Video Off features.

Setting:	Blank Screen	Writes blanks to the video buffer
	V/H SYNC + Blank	blank the screen and turn off vertical and horizontal scanning
	DPMS (Default)	Allowing BIOS to control the video display.

Video Off In Suspend

When enabled, the video is off in suspend mode.
Setting: No, Yes (Default).

Suspend Type

Setting: Stop Grant (Default), PwrOn Suspend.

Modem Use IRQ

It sets the IRQ used by the Modem.
Setting: NA, 3 (Default), 4, 5, 7, 9, 10, 11.

Suspend Mode

When “Enabled”, after the set time of system inactivity, all devices except the CPU will be shut off as the set time.
Setting: Disabled (Default), 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, 1 Hour.

HDD Power Down

When “Enabled”, after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.
Setting: Disabled (Default), 1 Min - 15 Min.

Soft-Off by PWR-BTTN

It defines the power-off mode when using an ATX power supply.
In the Instant Off mode, It allows powering off immediately upon pressing the power button.
In the Delay 4 Sec mode, the system powers off when the power button is pressed for more than 4 seconds or enters the suspend mode when pressed for less than 4 seconds.
Setting: Instant-off (Default), Delay 4 Sec. .

Wake-Up by PCI Card

It allows the system to wake up from a signal received from a PCI card such as a LAN card.
Setting: Disabled (Default), Enabled.

Power On by Ring

It enables or disables the power on of the system through the modem connected or LAN.
Setting: Disabled (Default), Enabled.

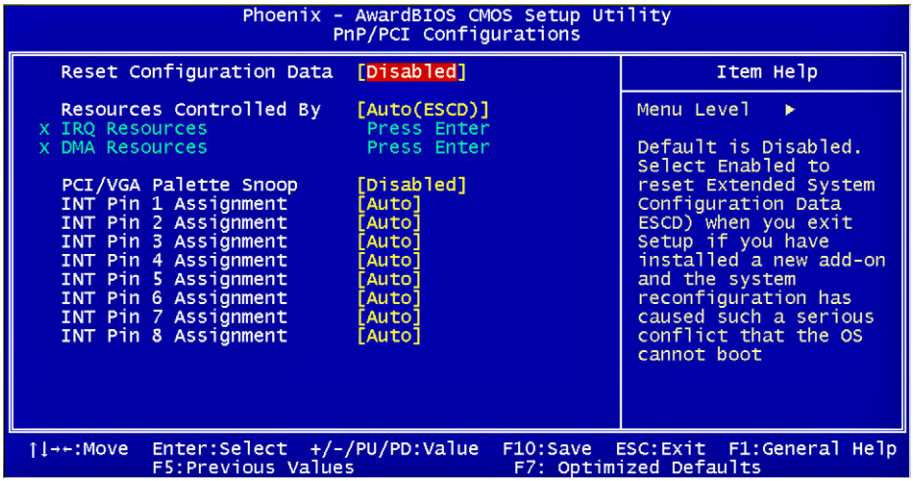
Resume by Alarm

It enables or disables the resumption of the system operation. When enabled, the user is allowed to set the Date and Time.
Setting: Disabled (Default), Enabled.

Reload Global Timer Events

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

3.8 PNP/PCI Configurations



Reset Configuration Data

It allows you to determine whether to reset the configuration data or not.
Setting: Disabled (Default), Enabled.

Resources Controlled By

This PnP BIOS can configure all of the boot and compatible devices with the use of a PnP operating system.
Setting: Auto(ESCD) (Default), Manual.

IRQ Resources

It allows you to configure the IRQ Resources.

DMA Resources

It allows you to configure the DMA Resources.

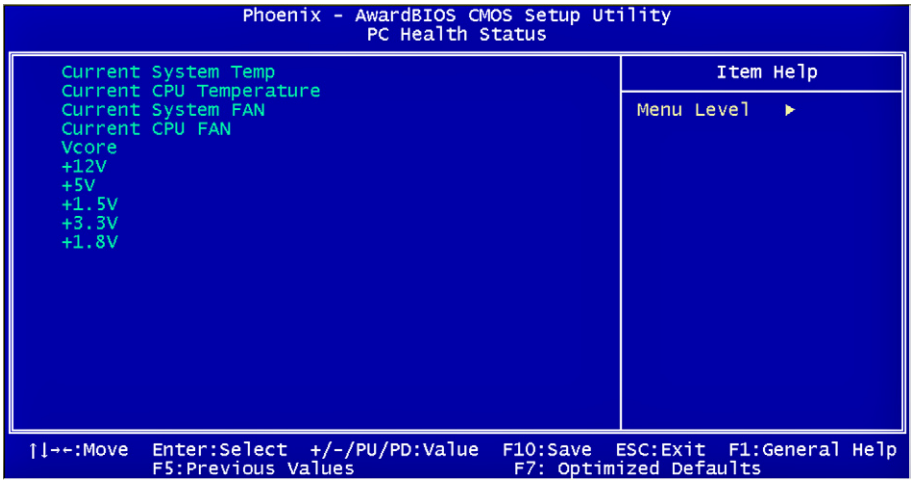
PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. It allows you to set whether or not MPEG ISA/VESA VGA cards can display with PCI/VGA.
When “Enabled”, a PCI/VGA can display with an MPEG ISA/VESA VGA card.
When “Disabled”, a PCI/VGA cannot display with an MPEG ISA/VESA VGA card.
Setting: Disabled (Default), Enabled.

INT Pin 1-8 Assignment

Setting: Auto (Default), 3, 4, 5, 7, 9, 10, 11, 12, 14, 15.

3.9 PC Health Status



Current System Temperature

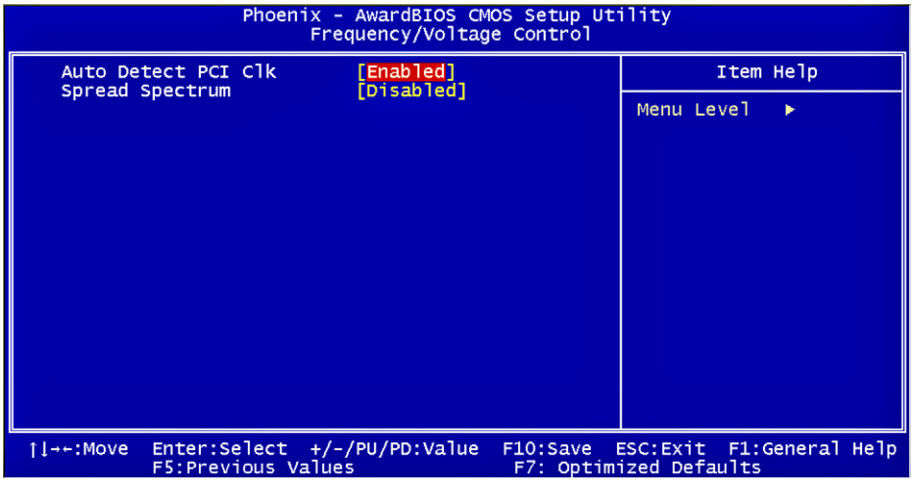
Current CPU Temperature

Current System FAN

Current CPU FAN

Vcore

3.10 Frequency/Voltage Control



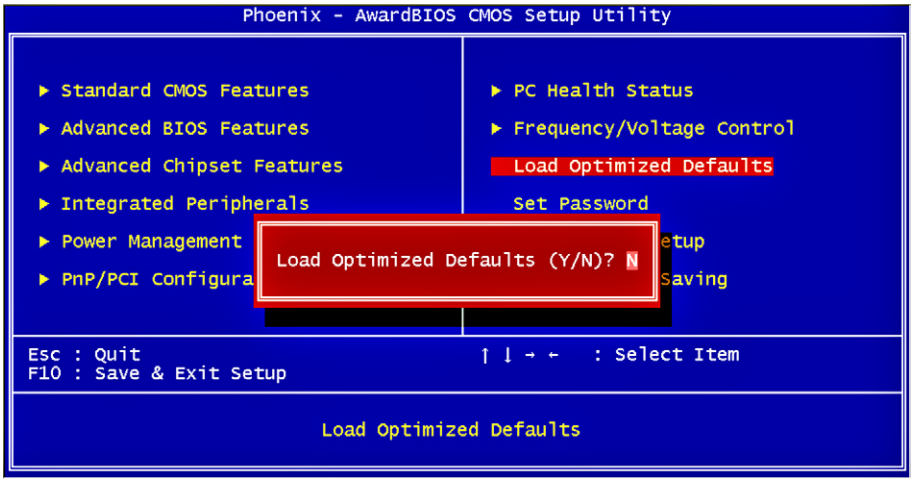
Auto Detect PCI Clk

It enables or disables the auto detection of the PCI clock.
Setting: Enabled (Default), Disabled.

Spread Spectrum

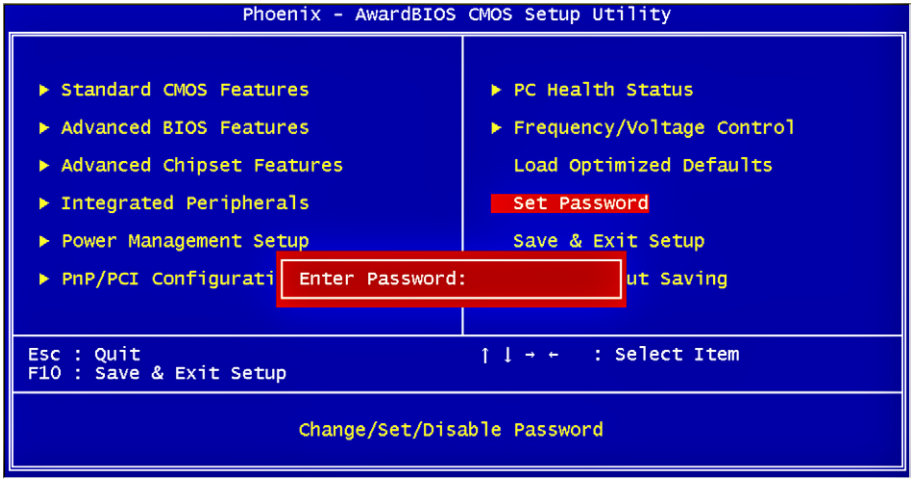
It sets the value of the spread spectrum. It is for CE testing use only.
Setting: Disabled (Default), Enabled.

3.11 Load Optimized Defaults



It allows you to load the default values to your system configuration. The default setting is optimal and enabled all high performance features.

3.12 Set Password

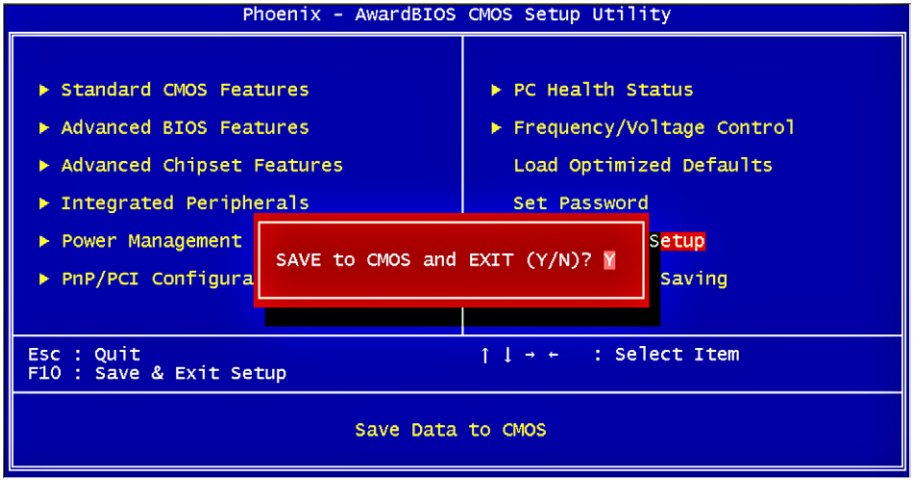


Useing Password to set a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>.

The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. And the system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

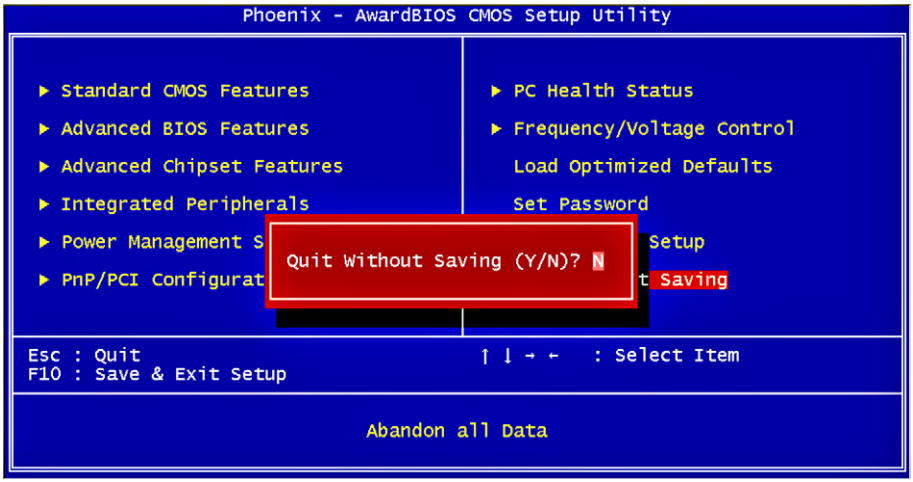
To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot, then you can enter BIOS Setup freely.

3.13 Save & Exit Setup



Typing “Y”, you will quit the setup utility and save all the changes into the CMOS memory.
Typing “N”, you will return to Setup utility.

3.14 Exit Without Saving



Typing “Y” will quit the Setup utility without saving the modifications.
Typing “N” will return you to Setup utility.

3.15 BIOS Beep Sound code list

Beep Sound	Message
1 short (Beep)	System booting is normally
2 short (Beep)	CMOS setting error
1 long - 1 short (Beep)	DRAM error
1 long - 2 short (Beep)	Display card or monitor connected error
1 long - 3 short (Beep)	Keyboard error
1 long - 9 short (Beep)	ROM error
Long (Beep) continuous	DRAM hasn't inset correctly
Short (Beep) continuous	POWER supply has problem

3.16 BIOS memory mapping

Address	Device Description
E000:0000h - F000:FFFFh	System BIOS Area
D000:2000h - D000:FFFFh	Free space
D000:0000h - D000:1FFFh	LAN ROM
C000:E000h - CF00:FFFFh	Free space
C000:0000h - C000:DFFFh	VGA BIOS
A000:0000h - B000:FFFFh	VGA RAM
0000:0000h - 9000:FFFFh	DOS 640K

3.17 Award BIOS Post Codes

CFh	Test CMOS read/write functionality
C0h	Early chipset initialization: Disable shadow RAM, L2 cache (socket 7 and below), program basic chipset registers
C1h	Detect memory: Auto detection of DRAM size, type and ECC, auto detection of L2 cache (socket 7 and below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM
01h	Expand the Xgroup codes located in physical memory address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch
04h	Reserved
05h	Blank out screen; Clear CMOS error flag
06h	Reserved
07h	Clear 8042 interface; Initialize 8042 self test
08h	Test special keyboard controller for Winbond 977 series Super I/O chips; Enable keyboard interface
09h	Reserved
0Ah	Disable PS/2 mouse interface (optional); Auto detect ports for keyboard & mouse followed by a port & interface swap (optional); Reset keyboard for Winbond 977 series Super I/O chips
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is read/write capable or not. If test fails, keep beeping the speaker
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash read/write codes into the run time area in F000 for ESCD & DMI support
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real time clock power status and then check for overrride
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686)
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)

20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	Check validity of RTC value; Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead; Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information; Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots; Early PCI initialization - Enumerate PCI bus number, assign memory & I/O resource, search for a valid VGA device & VGA BIOS, and put it into C000:0
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	Program CPU internal MTRR (P6 & PII) for 0-640K memory address; Initialize the APIC for Pentium class CPU; Program early chipset according to CMOS setup; Measure CPU speed; Invoke video BIOS
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	Initialize multilanguage; Put information on screen display, including Award title, CPU type, CPU speed, etc...
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1
3Fh	Reserved
40h	Test 9259 interrupt mask bits for channel 2
41h	Reserved
42h	Reserved
43h	Test 8259 functionality
44h	Reserved
45h	Reserved
46h	Reserved

47h	Initialize EISA slot
48h	Reserved
49h	Calculate total memory by testing the last double last word of each 64K page; Program writes allocation for AMD K5 CPU
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	Program MTRR of M1 CPU; initialize L2 cache for P6 class CPU & program cacheable range; Initialize the APIC for P6 class CPU; On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical
4Fh	reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	Display PnP logo; Early ISA PnP initialization and assign CSN to every ISA PnP device
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code
5Ah	Reserved
5Bh	Show message for entering AWDFLASH.EXE from FDD (optional feature)
5Ch	Reserved
5Dh	Initialize Init_Onboard_Super_IO switch; Initialize Init_Onboard_ AUDIO switch
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-Configuration table
6Ch	Reserved
6Dh	Assign resources to all ISA PnP devices; Auto assign ports to onboard COM ports if the corresponding item in Setup is set to “AUTO”
6Eh	Reserved
6Fh	Initialize floppy controller; Setup floppy related fields in 40:hardware

70h	Reserved
71h	Reserved
72h	Reserved
73h	Enter AWDFLASH.EXE if: AWDFLASH.EXE is found in floppy dive and ALT+F2 is pressed
74h	Reserved
75h	Detect and install all IDE devices: HDD, LS120, ZIP, CDROM...
76h	Reserved
77h	Detect serial ports and parallel ports
78h	Reserved
79h	Reserved
7Ah	Detect and install coprocessor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported: if errors occur, report errors & wait for keys, if no errors occur or F1 key is pressed continue - Clear EPA or customization logo
80h	Reserved
81h	Reserved
82H	Call chipset power management hook: Recover the text fond used by EPA logo (not for full screen logo), If password is set, ask for password
83H	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	Final USB initialization; NET PC: Build SYSID structure; Switch screen back to text mode; Set up ACPI table at top of memory; Invoke ISA adapter ROM's; Assign IRQ's to PCI devices; Initialize APM; Clear noise of IRQ's
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	Enable L2 cache; Program boot up speed; Chipset final initialization; Power management final initialization; Clear screen and display summary table; Program K^ write allocation; Program P6 class write combining
95h	Program daylight saving; Update keyboard LED and typematic rate
96h	Build MP table; Build and update ESCD; Set CMOS century to 20h or 19h; Load CMOS time into DOS timer tick; Build MSIRQ routing table
FFh	Boot attempt (INT 19h)

Chapter 4

Appendix

4.1 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.
The following table lists the I/O port addresses used.

Address	Device Description
00000000 - 00000CF7	PCI bus
00000060 - 00000060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
00000064 - 00000064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
00000070 - 00000073	System CMOS/real time clock
000001F0 - 000001F7	Primary IDE Channel
00000274 - 00000277	ISAPNP Read Data Port
00000279 - 00000279	ISAPNP Read Data Port
000002F8 - 000002FF	Communications Port
00000378 - 0000037F	Printer Port
000003B0 - 000003BB	Intel(R) 82945G Express Chipset Family
000003C0 - 000003DF	Intel(R) 82945G Express Chipset Family
000003F0 - 000003F5	Standard floppy disk controller
000003F6 - 000003F6	Primary IDE Channel
000003F7 - 000003F7	Standard floppy disk controller
000003F8 - 000003FF	Communications Port
00000778 - 0000077B	Printer Port
00000A79 - 00000A79	ISAPNP Read Data Port
00000D00 - 0000FFFF	PCI bus
0000D000 - 0000DFFF	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
0000DF00 - 0000DF1F	Intel(R) PRO/1000 PM Network Connection
0000F500 - 0000F50F	Intel(R) 82801GB/GR/GH (ICH7 Family) Serial ATA Storage Controller - 27C0
0000F600 - 0000F603	Intel(R) 82801GB/GR/GH (ICH7 Family) Serial ATA Storage Controller - 27C0

0000F700 - 0000F707	Intel(R) 82801GB/GR/GH (ICH7 Family) Serial ATA Storage Controller - 27C0
0000F800 - 0000F803	Intel(R) 82801GB/GR/GH (ICH7 Family) Serial ATA Storage Controller - 27C0
0000F900 - 0000F907	Intel(R) 82801GB/GR/GH (ICH7 Family) Serial ATA Storage Controller - 27C0
0000FA00 - 0000FA0F	Intel(R) 82801G (ICH7 Family) Ultra ATA Storage Controllers - 27DF
0000FB00 - 0000FB1F	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
0000FC00 - 0000FC1F	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
0000FD00 - 0000FD1F	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
0000FE00 - 0000FE1F	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
0000FF00 - 0000FF07	Intel(R) 82945G Express Chipset Family
D0000000 - DFFFFFFF	Intel(R) 82945G Express Chipset Family
FDD00000 - FDDFFFFF	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
FDDE0000 - FDDFFFFF	Intel(R) PRO/1000 PM Network Connection
FDE00000 - FDEFFFFF	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
FDF00000 - FDF7FFFF	Intel(R) 82945G Express Chipset Family
FDF80000 - FDFBFFFF	Intel(R) 82945G Express Chipset Family
FDFFF000 - FDFFF3FF	Intel EHCI Compliance Test Tool
000A0000 - 000BFFFF	Intel(R) 82945G Express Chipset Family
000A0000 - 000BFFFF	PCI bus
000C0000 - 000DFFFF	PCI bus
3F700000 - FEBFFFFF	PCI bus

4.2 Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ 3	Communications Port
IRQ 4	Communications Port
IRQ 6	Standard floppy disk controller
IRQ 8	System CMOS/real time clock
IRQ 9	Microsoft ACPI-Compliant System
IRQ 12	PS/2 Compatible Mouse
IRQ 14	Primary IDE Channel
IRQ 16	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
IRQ 16	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
IRQ 16	Intel(R) 82945G Express Chipset Family
IRQ 16	Intel(R) PRO/1000 PM Network Connection
IRQ 18	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
IRQ 19	Intel(R) 82801GB/GR/GH (ICH7 Family) Serial ATA Storage Controller - 27C0
IRQ 19	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
IRQ 23	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
IRQ 23	Intel EHCI Compliance Test Tool