

POS Motherboard

With Intel Mobile Celeron Processor /
Intel Pentium 4-M Processor (E1-CPU)

User Manual

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Contents

Introduction.....	1
Overview.....	1
Block Diagram.....	3
Technical Data	5
Mechanical Arrangement	10
On-board Components.....	11
Processor.....	11
I/O Controller Hub.....	12
Super I/O-Controller.....	12
Main Memory	13
Graphic System	14
Graphics and Memory Controller HUB 82845GV (GMCH).....	14
Jumper Settings.....	15
PCI Serial Port Controller IT8874F	16
Audio System.....	16
Stereo Amplifier TEA2025B.....	16
Clock Generator RTM660-109R	16
Hardware Monitoring	17
Floppy Interface	17
32 Bit PCI Onboard Plug-In Modul Interface.....	17
Serial Interface COM1, COM2*.....	18
Serial Interface COM3*, COM4*	18
Keyboard / PS/2 Mouse Interface	18
USB Interface	18
Parallel Interface.....	19
Hard-Disk Interface (IDE).....	19
Cash Drawer Interface	19
Status Display Interface	20
Fans.....	20
Changing the CPU Battery	21
Plugin Modules	22
CRT Adapter.....	22
COM3*,4* Adapter	22
USBplus Adapter (USB 2.0; 2 versions)	22
LCD-TFT Adapter	22
DVI Bridge	23
LAN 10/100 Adapter	23
WLAN	23

PCI Onboard VGA/4 Controller	23
PCI – Interface	24
Devices and Functions	24
Additional Onboard Components	25
Restrictions	25
Plug and Play.....	26
Operating Modes.....	27
General	27
Normal Mode/Standby Mode.....	27
Switching on	27
Switching Off	27
Power Failure	27
Connecting Peripherals.....	28
Connector Assignments.....	29
Connector for external connection	29
Serial Interfaces COM1, COM2*.....	29
KYBD	29
USB Interface USB1, USB2 (onboard)	30
CRT connection	30
LCD-TFT Adapter	31
LPT Connection	32
LAN 10/100.....	33
Microphone	33
Speaker Out	33
Connectors for internal connections	34
Main memory.....	34
Floppy Disk 1	36
Floppy Disk 2	37
Hard Disk (Local Bus IDE) Primary.....	38
Hard Disk (Local Bus IDE) Secondary.....	39
Parallel Interface.....	40
CRT-Adapter	40
LAN-Adapter	41
LCD-TFT Adapter (PanelLink Bridge).....	42
COM3*/COM4* Adapter.....	43
USBPLUS Adapter	44
USB 5,6	45
PS/2 MOUSE.....	45
Riser Card	46
PCI Onboard.....	50
Speaker	51
Power Supply Unit	51
Power On.....	52

Status Display	53
L12V – FAN1.....	53
CD-Audio.....	54
LINE IN.....	54
Gameport	54
BIOS Setup.....	55
Standard BIOS Version	55
BIOS Menu Bar	56
Legend Bar.....	57
General Help	58
Scroll Bar.....	58
Sub-Menu.....	58
Info screen.....	59
Productname:.....	59
Biosversion:.....	59
System, Mainboard, PowerSupply:	59
Main Menu	60
System Time [XX:XX:XX]	60
System Date [XX/XX/XXXX].....	60
Legacy Diskette A [1.44M 3.5"]	60
Primary & Secondary Master/Slave	61
SMART Monitoring	63
Extended Memory: XXX MB.....	63
Advanced Menu.....	64
Reset Configuration Data [No]	64
Speaker Volume [High]	64
PS/2 Mouse [Enabled].....	64
Large Disk Access Mode [DOS]	64
Legacy USB Support [Disabled]	65
USB TimeOut Value [High].....	65
Onboard LAN BootProm [Enabled]	65
QuickBoot Mode [Disabled].....	65
Video output to COM3 [Disabled]	65
Chipset Configuration.....	66
Local Bus IDE adapter [Both]	66
SMART Device Monitoring [Disabled]	66
Boot-Video device [Onboard]	66
PCI 2.1 Support [Enabled].....	66
USB 2.0 Support [Enabled]	66
I/O Device Configuration	67
Parallel port [Enabled].....	67
Mode [Bi-directional].....	67
Base I/O address	67
Interrupt.....	67
DMA channel.....	67

TouchScreen Routing [No Routing]	68
Game port [Enabled].....	68
Base I/O address	68
DMI Event Logging	68
View DMI event log [Enter]	68
Clear all DMI event logs [No]	68
Event logging [Enabled].....	69
Mark DMI events as read [Enter]	69
Security Menu	70
Set Supervisor Password	70
Power Menu	70
Power State [Stay off]	71
Wake-on Modes.....	71
Wake-On-LAN [Disabled]	71
Wake-On-Modem Ring [Disabled]	71
Wake-On-Time [Disabled]	71
Hardware Monitor	72
Boot Menu	73
Boot Order [Follow Setup Order]	73
Exit Menu	73
Exit Saving Changes	74
Exit Discarding Changes	74
Load Setup Defaults	74
Discard Changes	74
Save Changes	74
Test points codes	75
Abbreviations	86

Introduction

This manual describes the features of the Central Processing Unit (CPU) for the BEETLE POS systems based on the Mobile Intel Celeron™ Processor family and the Intel Pentium 4-M^R processor. With a frequency of 1.7 GHz up to 2.4 GHz (Celeron) and 1.7 GHz up to 2.2 GHz (Pentium 4-M), second level cache and many other features, these processors guarantee an increased performance of your BEETLE POS system.

Overview

Microprocessor	Support for the following processors: • Intel^R Pentium 4-M^R processor with 400 MHz system bus speed • Intel^R Celeron™ processor with 400 MHz system bus speed
Main Memory	Two 184-pin (DIMM) sockets, 2.5V Supports up to 2 GByte main memory
Chipset	• Intel^R Chipset 845GV with GMCH and ICH4
PCI Controller	IT8874F
I/O Controller	ITE I/O Cntrl. PC87366, consisting of: • Floppy controller • Parallel port • 2 Serial Ports • Keyboard Interface • PS/2 Mouse Interface • HW-Monitor

Video system	Video Memory part of main memory (max. 10MB under Windows) including 64MB pixel memory CRT resolution up to: 2048 x 1536 pixel / 32 bit color TFT resolution up to: • 1024 x 768 pixel / 24 bit color • 1600 x 1200 pixel / 24 bit color
Audio system	Onboard AC97 Audio Codec Mono Microphone Input Stereo Speaker Output (2 x 1,25W @ 8Ohm)
BIOS	Firmware Hub: 512kB Flash Memory Phoenix BIOS 4.0 Release 6.0
Peripheral Interfaces	• PS/2 keyboard and mouse shared interface • Two (Four) serial ports • One parallel port • Two (Four) Universal Serial (USB) ports • Two IDE interfaces with Ultra DMA support • One FD interface
PlugIn Modules	• COM3*,4* adapter • 12V version USB adapter • 24V version USB adapter • CRT adapter • LCD-TFT adapter • DVI bridge • LAN adapter • VGA/4 PCI controller • LAN PCI controller
Supported Risercards	Following Risercards are supported: • XL2-BP3P2I • M-BP2P1I
Additional Features	• Wake On LAN technology • Wake On Modem • Wake On time

Block Diagram

The block diagram shows all of the functional units of the E1 - CPU. The physical plug-in connections to the system and external peripherals are shown at the bottom of the diagram. Only the most important internal connectors are part of the block diagram (see next page).

Technical Data

Supported Systems	BEETLE /M II
Architecture	PC-AT compatible and POS – specific functional units
Operating Modes	Normal Mode, Power Save Mode
Power Management	ACPI 1.0, APM 1.2
Operating Systems	XP embedded, WIN XP, LINUX
Microprocessor	INTEL Pentium ^R 4-M (478 Pin uFCPGA package, 0.13 u technology) or INTEL Mobile Celeron ^R (478 Pin uFCPGA package, 0.13 u technology) Frequencies from 1.7GHz up to 2.4GHz 8 KB L1 data cache, 12 KB L1 program cache, up to 512KB L2 cache (dependent on processor)
Chipset	INTEL Chipset 845GV (contains 2 ICs):
Graphic and Memory Controller Hub (GMCH)	Memory Cntrl. Supports DDR SDRAM with 266 MHz System memory bus, Video memory is part of main memory, Graphic supports 2D and 3D and video streams Video memory with INTEL Extreme Graphics Driver max. 64MB (Dynamic Video Memory Technology)

Max. Resolution CRT	2048 x 1536 x 32 Bit color @ 60 Hz
Max. Resolution TFT	1600 x 1200 24 Bit color
I/O Controller Hub 4 (ICH4)	LAN 10/100 Cntrl., IDE-Cntrl. w/ UDMA, USB Cntrl. UHCI and EHCI, AC97 Link for Audio and telephony CODEC, Interrupt-Cntrl., DMA-Cntrl., LPC-Interface, RTC, SMBus-Host interface
Super I/O	NS87366 Floppy Cntrl., Parallel Port, 2 Serial Ports, Keybd. Interface, PS/2 Mouse Interface, HW- Monitor
Sound controller	CS4299 Audio Codec controller with the following AC`97 functions: 20 Bit Stereo DAC and 18 Bit Stereo ADC Analog Line-Level Input (CD) Mono Mic Input (MIC) Stereo Line-Level Output
Sound connection	Mono Microphone Input, Stereo Speaker Output (2 x 1,25 W@ 8 Ohm)
Main Memory	128 MB up to 2GB, 2 DIMM - sockets (184 pin), 2.5 V DDR SDRAM technology, unbuffered nonECC, DDR266 - Standard DIMM Height up to 35 mm
PCI Interface	PCI-Bus (32 bit interface, 33MHz)
BIOS	Firmware Hub 82802 (FWH): 512KB Flash Memory, Phoenix BIOS, PnP, PCI Rev.1.0A, DMI -support
Battery	3 V Lithium for RTC and SIO Type: CR1/3 N , 160 mAh
System Bus Frequency	400 MHz
RAM Bus Frequency	266 MHz

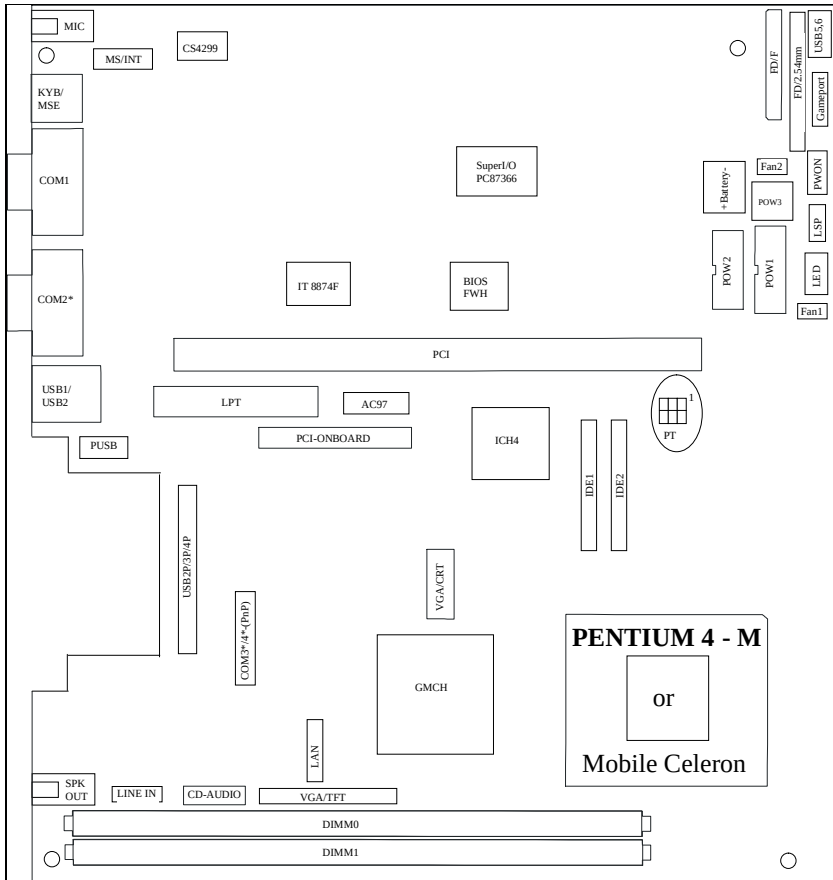
PCI Bus Frequency	33 MHz
Wake On feature	Wake On LAN (w/ connector for Standard- LAN- adapter), Wake On MODEM support, Wake on Time
Keyboard connection	PC-AT compatible
PS/2-Mouse connection	via Y-cable together with keyboard optional internal connection
Serial interfaces	COM1, COM2* COM3*, COM4* - adapter optional and alternative to (USB2plus, USB3plus, USB4plus)-adapter
Parallel interface	IEEE1284 compatible (ECP, EPP, PS/2-compatible)
Loudspeaker	AT-compatible, volume control defined by BIOS Setup in 3 steps: high- , medium- , low volume
Floppy disk connection	Standard interface CMOS, NEC 765 compatible, foil connector and 2.54 mm connector
Hard disk connection	Local Bus IDE interface, Primary/Secondary for 4 drives, PIO Mode 0 - Mode 4, ULTRA DMA Mode 0 – Mode 2, 2mm connector for primary and secondary each
USB connection	Version 1.1, 2.0 USB1, 2: Standard 2 port connector, series A USB(2),3,4: Standard 1 port connector + power (i.e. BERG 74239-X00) (USB2plus, USB3plus, USB4plus)-adapter with +5V system voltage optional and alternative to COM3*, COM4*- adapter (if USB plus -adapter is used, USB2 is not available) USB5,6: 2 x 4 pin header, 2.54 mm

Cash drawer connection	up to 2 cash drawers can be connected, connection via RJ12 connector inside Power supply (only for one cash drawer)
Gameport	2 x 8 pin header, 2.54 mm
PCI Plug-in card interface	32 bit interface, 33 MHz
Status display connection	support for LEDs: Power On and HD activity
Current Consumption Pentium 4-M/2.2 GHz 512 MB Ram	+ 3,3 V ~ 3,5 A + 5 V ~ 0,7 A + 12 V ~ 3 A
Max. Current (for keyboard)	+5V: 500 mA
Max. Current per port (for COM2*,3*,4*)	+12V: 600 mA
Max. Current in total (for COM2*,3*,4*)	+12V: 900 mA
Max. Current per port (for COM2*,3*,4*)	+5V: 300 mA
Max. Current in total (for COM2*,3*,4*)	+5V: 500 mA
Max. Current per port Standard USB1,USB2	+5V: 500 mA
Max. Current in total Standard USB1,USB2	+5V: 1,0 A
Max. Current per port Powered USB (for USB2plus, USB3plus, USB4plus) (for USB2plus, USB3plus, USB4plus, 12V version) (USB4plus, 24V version)	+5V: 500 mA +12V: 1,5 A +24V: 3,0 A

Max. Current in total Powered USB (for USB2 plus, USB3 plus, USB4 plus) (for USB2 plus, USB3 plus, USB4 plus, 12V version) (for USB2 plus, USB3 plus, USB4 plus, 24V version)	+5V: 1,5 A +12V: 2,0 A +24V: 3,0 A
Fuses (Polyswitches) +5V	COM2*, COM3*, COM4*, USB1, USB2, Keyboard, Mouse Powered USB (Fuse on adapter)
+12V	COM2* COM3*, COM4* (Fuse on adapter) Powered USB (Fuse on adapter)
+24V:	Powered USB (Fuse on adapter)
Board Dimensions	255 mm x 220 mm

Mechanical Arrangement

The CPU comprises the printed circuit board with connectors for all external peripheral connections and for installing the optional plug-in cards.



On-board Components

Processor

The E1- CPU supports Pentium 4-M processors as well as Celeron processors in FC-PGA package. The released types are:

Processor type	Processor speed	System Bus frequency	Cache size
Mobile Celeron	2.4 GHz	400 MHz	256 KB
Pentium 4-M	1.7 GHz	400 MHz	512 KB
Pentium 4-M	2.2 GHz	400 MHz	512 KB

Mobile INTEL Pentium 4-M Microprocessor

- The Processor utilizes a 478-pin, Micro Flip-Chip Pin Grid Array (Micro-FCPGA) and runs with 400MHz system bus. The program cache is a 12KB L1 cache and the advanced transfer cache is a 512KB L2 cache.
- The processor supports Enhanced Intel SpeedStep technology.
- The microprocessor is binary compatible with other members of the x86 family.
- The INTEL^R PENTIUM^R 4 – M uses AGTL+ signaling technology. This low power technology has larger noise margins and reduced ringing than GTL.

Mobile INTEL Celeron Microprocessor

- The Processor uses a 478-pin, Micro Flip-Chip Pin Grid Array (Micro-FCPGA) and runs with 400MHz system bus. The execution trace cache is a 12KB L1 cache and the advanced transfer cache is a 256KB L2 cache.
- The microprocessor is binary compatible with other members of the x86 family.
- The INTEL^R CELERON^R uses AGTL+ signaling technology. This low power technology has larger noise margins and reduced ringing than GTL.

I/O Controller Hub

This Hub provides extensive I/O support. Functions and capabilities include:

- PCI (33 MHz) support
- Enhanced DMA controller, Interrupt controller and Timer functions
- Integrated IDE controller supports Ultra ATA 100/66/33
- USB host interface (3 UHCI Controller with 2 ports each Vers. 1.1 and 1 EHCI Controller with 6 ports Vers. 2.0)
- Integrated LAN controller 10/100 Mbit/sec Ethernet
- System Management Bus (SMB)
- AC97 Vers. 2.3 support for audio and modem
- Low Pin Count (LPC) interface
- Firmware Hub (FWH) interface support

Super I/O-Controller

This is a Low Pin Count Interface-based highly integrated Super I/O and provides the following functions:

- Two 16C550 UARTs
- IEEE1284 Parallel Port
- Floppy Disk Controller
- Keyboard and PS/2 Mouse Controller
- Game Port
- Enhanced Hardware Monitor
- Fan Speed Controller
- 40 General Purpose I/O pins

The Super I/O Controller is housed in a 128 pin QFP package.

Main Memory

On the E1- CPU two DIMM (184 Pin) sockets are provided for connecting DDR modules in unbuffered SDRAM technology from 256 MB (1 x 256 MB) up to 2 GByte (2 x 1GB) DDR DIMMs with different sizes can be used.

One or both DDR DIMMs may be assembled. The DDR DIMMs are unbuffered 2.5V memory modules.

The BIOS automatically detects via SPD memory type, size and speed.

	Main Memory	
Socket 1	Socket 2	Total capacity
32MBx64	(32MBx64)	256 MB (512 MB)
64MBx64	(64MBx64)	512 MB (1 GB)

➔ Any combinations of these four DIMMs are allowed.

Graphic System

Graphics and Memory Controller HUB 82845GV (GMCH)

The GMCH integrates a system memory DDR SDRAM controller that supports 64MB up to 2GB memory (266MHz). It contains also a graphic controller for enhanced integrated 2D and 3D graphics performance.

The GMCH drives via a CRT adapter a standard CRT monitor up to a resolution of 2048x1536 pixels with 32-bit at 60 Hz.

For connecting TFT LCDs the GMCH provides a Digital Video Out interface to implement a resolution up to 1600 x 1200 pixels with 24-bit. The DVO interface is driving the LCD-TFT adapter (Panellink Bridge) and has low voltage high-speed signaling to allow operating at higher frequencies.

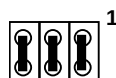
The GMCH has a core voltage of 1.5 V, the system memory operates with 2.5 V.

The GMCH is housed in a 760 pin BGA package.

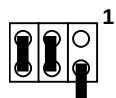
Jumper Settings

PT 3	PT 2	PT 1	VIDEO Mode	DISPLAY Size	Display Type / Clock Freq.
closed	closed	closed	SVGA	TFT 12"	BA 72A (30 MHz)
closed	closed	open	XGA	TFT 15"	BA 73A (65 MHz)
closed	open	open	SVGA	TFT 12"	BA 72A-1 (38 MHz)
open	closed	closed	VGA	TFT 10"	640 x 480 (PB Application)

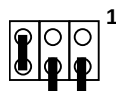
12" Monitor BA72A PT:



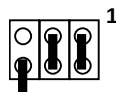
15" Monitor BA73A PT:



12" Monitor BA72A-1 PT:



10" Monitor 640 x 480 (special application) PT:



➔ When using a «Plug and Display» TFT screen (e.g. BA72A-2; BA73A-2 or SNIkey 12A-2) a special jumper setting is not necessary.

PCI Serial Port Controller IT8874F

The on-board IT8874F provides a simple solution to build a serial port on PCI bus with PnP features. The controller integrates two serial ports based on 16C550 UART function.

The IT8874F is housed in a 128 pin PQFP package.

Audio System

The CS4299 is a Codec with AC'97 features. It is implemented as 20 bit stereo DAC and 18 bit stereo ADC with sample rate conversion. The E1- CPU uses one microphone mono input, a line stereo input and the line stereo output which will drive the stereo amplifier TEA2025B.

The CS4299 is housed in a 48 pin LQFP package.

Stereo Amplifier TEA2025B

The TEA2025B is a stereo audio power amplifier capable of delivering typically 1,25 Watt per channel of continuous average power to an 8 Ohm load with 0.1% (THD) using a 12 V power supply.

The TEA2025B is housed in a 16 pin DIL package.

Clock Generator RTM660-109R

The REALTEK Clock Generator RTM660-109R is designed for the INTEL chip-set 845GV and provides all clocks for the chipset, microprocessor, DDR DIMMs, PCI interface, USB interface and Super I/O.

The RTM660-109R provides an I²C 2 wire interface to program the internal registers. For EMI reduction the synthesizer provides programmable spread spectrum. The RTM660-109R is housed in 56 pin SSOP package.

Hardware Monitoring

The PC87366 contains an enhanced Hardware Monitor which will be used for sensing/ controlling the following signals:

- Temperature of the processor
- Core voltage of the processor
- 3,3V system voltage
- 2,5V system voltage for power management
- 1,5V core voltage
- 5V system voltage
- Battery voltage
- 12V system voltage
- -12V system voltage
- Fan tachometer signal of processor fan
- Fan tachometer signal of system fan
- Fan tachometer signal of PSU fan
- Fan Control (processor- and system- fan)
- Fan Control (PSU fan)

Floppy Interface

For connecting Floppy drives there are two different connectors on the CPU available. These are a 2.54mm standard header for 1" drives and a foil cable connector for 1/2" drives.

Standard 1.44MB and 720KB Floppy Discs are supported.

32 Bit PCI Onboard Plug-In Modul Interface

The Onboard 32 bit PCI bus interface is provided to assemble new PCI bus based Plug-In-Modules.

The PCI bus interface contains all signals, which are necessary for a double-sided (two clock signals) PCI Master module. Furthermore the WOL interface is provided, i.e. the Standby Voltage and the Wake On signal are available.

Serial Interface COM1, COM2*

COM1 is the standard serial interface controlled by the Super I/O PC87366. On the 9 pin DSUB connector(male) are all signals available incl. the modem signals RI and DCD.

The I/O assignments of the serial port COM2* deviate from the standard in the way it is equipped with system voltages of +5V and +12V instead of the signals RI (M3) and DCD (M5).

The channel is connected via 9-pin D-sub (female) socket because of the additional system voltages.

Serial Interface COM3*, COM4*

These serial interfaces are controlled on the mainboard by the SuperI/O IT8874 (PnP). The interface signals and the voltages +5V and +12V are routed to a 2 x 13 pin header (2 mm). This header serves as serial interface connector for the COM3*,COM4* interface adapter.

Keyboard / PS/2 Mouse Interface

The keyboard controller is part of the SuperI/O. The keyboard interface - as well as the PS/2 – mouse interface - is available on the Mini DIN connector. For usage both of them a Y- adapter-cable(introduced) is necessary.

USB Interface

The USB interface supplied by the ICH4 contains 3 host controller for 6 downstream ports providing both data rates, 12 Mb/sec for full speed USB peripherals and 1.5 Mb/sec for low speed USB peripherals. Software protocol relates to UHCI Design guide (USB 1.1). Additionally one EHCI host controller is implemented to support all 6 ports with high speed 480Mb/sec (USB 2.0).

USB ports 1 and 2 are available on the mainboard.
The USB connector is type Stack A.

USB ports 3 and 4 are available if one of the PowerUSB modules (12V or 24V) is used (USB3plus,USB4plus). Instead of USB2 onboard USB2plus on the Power USB module is available.

On the PowerUSB modules are connectors (i.e. type BERG 74239-x00) assembled.

USB ports 5 and 6 are on a 2.54 mm header onboard available. A special cable has to be used for connecting to the rear- or the frontside of the BEETLE system.

Parallel Interface

The standard interface LPT1 may be used for peripherals with parallel interface. There are several modes supported (PS/2 compatible, EPP and ECP). The connector on the CPU is a 2 x 13-pin header.

Hard-Disk Interface (IDE)

The CPU features a UDMA IDE interface for connecting up to 4 ATA compatible drives. The I/O addresses conform to the AT standard. The connectors on the CPU are 2 x 22-pin header (2-mm arrangement) for primary and secondary.

All parameters of the drives are read by the BIOS automatically and stored in the BIOS setup parameter set.

The E1- CPU supports IDE drives up to PIO-Mode 4 and UltraDMA Mode 2.

Cash Drawer Interface

The logic for controlling the cash drawers is placed on the E1- CPU. The I/O assignment is compatible to other CPU's in BEETLE systems.

Input031x/ bit6	LAZU1N=0	Cash drawer 1 closed or not present
(x = 0 – 7)	LAZU1N=1	Cash drawer 1 open

Input031x/ bit7	LAZU2N=0	Cash drawer 2 closed or not present
(x = 0 – 7)	LAZU2N=1	Cash drawer 2 open

The output bit KLA1,2 unlocks the cash drawers.

Output 031x/ bit6	KLA1=0	No activity
(x = 0 – 7)	KLA1=1	Unlock cash drawer 1
Output 031x/ bit7	KLA2=0	No activity
(x = 0 – 7)	KLA2=1	Unlock cash drawer 2

Bit 6 and Bit 7 never may be set both. Only one of them has to be activated at the same time. A driver has to be installed to prevent opening both cash drawers. The time delay between opening drawer 1 and drawer 2 has to be about 0.5 – 1 second.

The length of the pulse for opening the cashdrawer has to be nominal 130msec. There must be a time interval of 6 seconds between two outputs (charging time of capacitor in the cash-drawer electronic circuitry).

Status Display Interface

To display system activities there are two interface signals available.

LED 1 green : Power On

LED 2 yellow: Hard Disk activity / Memory Card activity

Fans

Three fans are supported by the CPU, i.e. three tachometer lines are monitored by Hardware and may be reported via BIOS SETUP.

For controlling the fan speed, two Control lines are implemented. The PSU fan is controlled by one line, CPU- and system- fan are controlled via a common line.

Changing the CPU Battery

The BEETLE POS systems are equipped with a lithium battery on the CPU board to ensure data retention, the time and the setup parameters. The battery should be changed approximately every five years.

- ➔ When inserting the new battery, make sure the polarity is correct. This is visibly marked in the socket. Incorrect replacement of the battery may lead to the danger of explosion.

The battery is located in a socket in the CPU (see page 10). To gain access to the battery, proceed as described in the according chapters of your BEETLE User Manual.

- The lithium battery must be replaced only by identical batteries or types recommended by Wincor Nixdorf International.
- You can return the used batteries to your Wincor Nixdorf International sales outlet.
- Batteries containing harmful substances are marked accordingly. The chemical denotations are as follows: CD = Cadmium; Pb = Lead, Li = Lithium.



This symbol on a battery tells you that batteries containing harmful substances must not be disposed of as household waste. Follow the country specific laws and regulations. Within the European Union you are legally bound to return these batteries to the service organisation where you purchased the new battery.

- ➔ The setup parameters must be reset each time the battery is changed.

Plugin Modules

CRT Adapter

A new CRT adapter is available for the E1 CPU. It is downwards compatible to the D2 Star-CPU.

COM3*,4* Adapter

A new COM3*,4* module with PnP-features is available for the E1- CPU.

It may be assembled **only alternatively** to a USBplus adapter.
The voltages +5V and +12V are protected via Polyswitches.

USBplus Adapter (USB 2.0; 2 versions)

The new USBplus adapter (USB 2.0) is available in two versions :

- 12V version with 3 USBplus ports with 12V
- 24V version with 2 USBplus ports with 12V and 1 USBplus port with 24V

The voltages +12V and +24V are protected via polyswitches.

LCD-TFT Adapter

There is a new LCD-TFT adapter (Panellink Bridge) to connect the display family w/o DDC (BA72A, BA73A) as well as the display family with DDC (BA72A-2, BA73A-2).

DVI Bridge

A new DVI bridge may be assembled to connect displays with DV interface.

LAN 10/100 Adapter

While the LAN controller is part of the INTEL chipset the LAN adapter contains the physical layer including Ethernet address.

WLAN

The WLAN Submodule offers a comfortable way to equip BEETLE systems with the new technology of wireless LAN. It consists of the WLAN Mini-PCI module, the MiniPCI-PCI adapter and a Hirose Mini Coaxial cable. All antennas with a SMA connector can be used.

PCI Onboard VGA/4 Controller

The PCI Onboard VGA/4 controller may be assembled alternatively to any other PCI Onboard controller. It supports 2 Monochrome displays, i.e. BA69 (5.7") and BA70 (10.4").

PCI – Interface

Devices and Functions

The ICH4 incorporates a variety of PCI functions as shown in the table below. These functions are divided into three logical devices: (Bus0, Device29 ; Bus0, Device30 and Bus0, Device31).

BUS: DEVICE:FUNCTION	FUNCTION DESCRIPTION
Bus 0: Device 29: Function 0	USB UHCI Controller # 1
Bus 0: Device 29: Function 1	USB UHCI Controller # 2
Bus 0: Device 29: Function 2	USB UHCI Controller # 3
Bus 0: Device 29: Function 7	USB 2.0 EHCI Controller
Bus 0: Device 30: Function 0	Hub Interface to PCI Bridge
Bus 0: Device 31: Function 0	PCI to LPC Bridge
Bus 0: Device 31: Function 1	IDE Controller
Bus 0: Device 31: Function 3	SMBus Controller
Bus 0: Device 31: Function 5	AC'97 Audio Controller
Bus 0: Device 31: Function 6	AC'97 Modem Controller
Bus 1: Device 8: Function 0	LAN Controller

Additional Onboard Components

There are two Onboard PCI connectors assembled on the E1- CPU. A complete PCI –Bus is implemented on the Onboard PCI connector for assembling a POSboard.

An Onboard VGA/4- Submodule, a Wireless Lan (WLAN) module and a new Secondary CRT- Controller are available.

Bus 1: Device 10: Function 0	Onboard LAN/WLAN- Submodule Onboard Secondary CRT- Submodule
Bus 1: Device 11: Function 0	Onboard VGA/4- Submodule

Restrictions

- No support of PCI cachable memory (SBO# and SDONE signals are not on the interface connector) .
- No support of 64 bit bus extension
- No support of JTAG/Boundary Scan pins

Plug and Play

The BIOS supports PnP capabilities by managing the system resources. All I/O-addresses, IRQ-channels and DMA channels, which are used by the system are marked as reserved and the remaining resources are available for the PnP – OS. See also BIOS specification.

Operating Modes

General

The E1- CPU provides power management functions dependent on the installed Operating System.

Normal Mode/Standby Mode

Switching on

A 212 W Power Supply will be used in E1- CPU based systems. Connecting the PSU via AC line the Standby voltage P5VSB is supplied and the system is ready to be switched on (Standby mode). There are several possibilities to switch on the system.

The “regular” way to switch on the system is to activate the temporary switch at the frontside of the system.

➔ Short pressing the pushbutton will switch on the system.

For powering up the system via LAN the Onboard PCI connector is provided with the “Wake up” signal and the Standby voltage P5VSB.
Last not least the RTC can be used to switch on the system.

Switching Off

The system may be switched off either by activating the temporary switch at the frontside of the system or under Software Control.

➔ Pressing the pushbutton longer than 4 seconds will switch off the system.

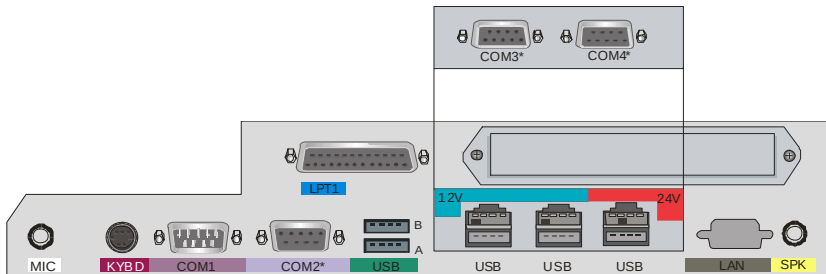
Power Failure

If the main power fails (AC input) for longer than 20 msec, the loss of Standby Voltage results in powering down the system.

After the main power returns the system responds depending on the BIOS Setup setting. If in the BIOS Setup “Restore” is chosen, the system enters the state before Power failure. If in the BIOS Setup “Stay Off” is chosen, the system stays off.

Connecting Peripherals

- ➔ When connecting peripherals always make sure that the system is switched off!



The motherboard offers a total of four serial interfaces: COM1 - COM4* and interfaces for connecting displays, modular printers, keyboards, USB-devices, loudspeaker and for the network connection.

- ➔ If the Power USB module is used the USB-B interface is not available.

Connector Assignments

Connector for external connection

Serial Interfaces COM1, COM2*

PIN #	COM1	COM2*
1	DCD1F	P12VFS
2	RXD1F	RXD2F
3	TXD1F	TXD2F
4	DTR1F	DTR2F
5	GNDF	GNDF
6	DSR1F	DSR1F
7	RTS1F	RTS2F
8	CTS1F	CTS2F
9	RI1F	P5VFS

KYBD

Your BEETLE system has a 6-pin mini-DIN jack for connecting a keyboard. Introduced BEETLE keyboards with PS/2 interface may be connected.

PIN #	KYB/E
1	KD
2	MSD
3	GND
4	P5VF
5	KC
6	MSC

USB Interface USB1, USB2 (onboard)

This is a 2 x 4 USB standard connector, male.

PIN #	USB1	USB2
1	P5V	P5V
2	U1D-	U2D-
3	U1D+	U2D+
4	GNDU	GNDU

CRT connection

You have the choice of using several adapters for connecting different types of displays.

CRT Adapter

If a CRT adapter is installed, you can connect any VGA monitor (like the MO34) to the BEETLE system via the 15-pin D-sub jack on the CRT adapter. Power is supplied to the monitor via the rubber connector on the BEETLE, located on the back of the housing.

The CRT interface connector is a standard 15 pin HDD-SUB connector, type female.

PIN #	CRT
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	GND
7	GND
8	GND
9	5VFU
10	GND
11	NC
12	DDCSDA
13	FHSYNC
14	FVSYNC
15	DDCSCL

LCD-TFT Adapter

With a LCD-TFT adapter you can also connect the displays BA72A (12") or BA73A (15") via the 40pin ITDR-connector. If one of these displays is connected, the internal loudspeaker of the system must be disconnected!

The connector is a 40 pin Mini Delta Ribbon connector, type female.

PIN #	TFT	PIN #	TFT
1	GND	2	TX2+
3	TX2 Shield	4	TX2-
5	P12V	6	GND
7	TX1+	8	TX1 Shield
9	TX1-	10	GND
11	P12V	12	P12V Shield
13	P12V	14	TXD
15	Touch Shield	16	RXD
17	FPEN	18	TX0+
19	TX0 Shield	20	TX0-
21	P5V	22	P5V
23	TXC+	24	TXC Shield
25	TXC-	26	Speaker OUT
27	DDC/SCL	28	DDC/SDA
29	NC	30	NC
31	NC	32	NC
33	NC	34	NC
35	NC	36	NC
37	NC	38	NC
39	NC	40	NC

LPT Connection

The standard parallel interface LPT1 is intended for connecting a modular printer.

You will find more information on how to connect other POS printers and more POS peripherals (e.g. Cash Drawers) to your BEETLE system in the User Manuals that come along with your BEETLE system.

The LPT1 port is provided with a standard 25 pin CANNON connector.

PIN #	LPT	PIN #	LPT
1	STRBEN	14	AUTOFN
2	CEN D0	15	ERRORN
3	CEN D1	16	INITN
4	CEN E1	17	SLCTIN
5	CEN D3	18	GND
6	CEN D4	19	GND
7	CEN D5	20	GND
8	CEN D6	21	GND
9	CEN D7	22	GND
10	ACKN	23	GND
11	PBUSY	24	GND
12	PE	25	GND
13	SLCT	26	

LAN 10/100

If a network adapter or controller board is installed, the system can be connected to a network (LAN 10/100 Mbit) from the POS terminal back panel. If a LAN adapter or controller board is not installed, this location on the back panel is closed by a dummy cover.

The connector for the LAN10/100 interface is a 8 pin RJ45 connector, type female.

PIN #	SIGNALS
1	TD +
2	TD -
3	RD +
4	NC
5	NC
6	RD -
7	NC
8	NC

Microphone

The Microphone connector is a 3.5 mm 5 pin “Stereo Phone Jack”.

PIN #	SIGNALS MIC
1	AGND
2	MICF
3	NC
4	VREFOUT
5	NC

Speaker Out

The connector for the speaker is a 5 pin 3.5 mm connector, type female.

PIN #	SIGNALS Out
1	AGND
2	L0LAF
3	NC
4	L0RAF
5	NC

Connectors for internal connections

Main memory

This is a 2 x 84 pin micro edge connector.

PIN #	Signals DIMM0, 1	PIN #	Signals DIMM0,1
1	RAMREF	93	GND
2	MD0	94	MD4
3	GND	95	MD5
4	MD1	96	P2V5
5	DQS0	97	DM0
6	MD2	98	MD6
7	P2V5	99	MD7
8	MD3	100	GND
9	NC	101	NC
10	NC	102	NC
11	GND	103	NC
12	MD8	104	P2V5
13	MD9	105	MD12
14	DQS1	106	MD13
15	P2V5	107	DM1
16	DDRCLKP1	108	P2V5
17	DDRCLKN1	109	MD14
18	GND	110	MD15
19	MD10	111	CKE1
20	MD11	112	P2V5
21	CKE0	113	NC
22	P2V5	114	MD20
23	MD16	115	MAA12
24	MD17	116	GND
25	DQS2	117	MD21
26	GND	118	MAA11
27	MAA9	119	DM2
28	MD18	120	P2V5
29	MAA7	121	MD22
30	P2V5	122	MAA8
31	MD19	123	MD23
32	MAA5	124	GND

PIN #	SIGNALS DIMM0,1	PIN #	SIGNALS DIMM0,1
33	MD24	125	MAA6
34	GND	126	MD28
35	MD25	127	MD29
36	DQS3	128	P2V5
37	MAA4	129	DM3
38	P2V5	130	MAA3
39	MD26	131	MD30
40	MD27	132	GND
41	MAA2	133	MD31
42	GND	134	NC
43	MAA1	135	NC
44	NC	136	P2V5
45	NC	137	DDRCLKP0
46	P2V5	138	DDRCLKN0
47	NC	139	GND
48	MAA0	140	NC
49	NC	141	MAA10
50	GND	142	NC
51	NC	143	P2V5
52	CSB#1	144	NC
53	MD32	145	GND
54	P2V5	146	MD36
55	MD33	147	MD37
56	DQS4	148	P2V5
57	MD34	149	DM4
58	GND	150	MD38
59	CSB#0	151	MD39
60	MD35	152	GND
61	MD40	153	MD44
62	P2V5	154	SRASA#
63	WEA#	155	MD45
64	MD41	156	P2V5
65	SCASA#	157	MSCS0N
66	GND	158	MSCS1N
67	DQS5	159	DM5
68	MD42	160	GND
69	MD43	161	MD46
70	P2V5	162	MD47
71	NC	163	NC

PIN #	SIGNALS DIMM0,1	PIN #	SIGNALS DIMM0,1
72	MD48	164	P2V5
73	MD49	165	MD52
74	GND	166	MD53
75	DDRCLKN2	167	NC
76	DDRCLKP2	168	P2V5
77	P2V5	169	DM6
78	DQS6	170	MD54
79	MD50	171	MD55
80	MD51	172	P2V5
81	GND	173	NC
82	P2V5	174	MD60
83	MD56	175	MD61
84	MD57	176	GND
85	P2V5	177	DM7
86	DQS7	178	MD62
87	MD58	179	MD63
88	MD59	180	P2V5
89	GND	181	DOSA0
90	NC	182	DOSA1
91	SMBDA	183	DOSA2
92	SMBCL	184	P2V5

Floppy Disk 1

This is a 2 x 17 pin flat cable connector.

PIN #	SIGNALS FD/F	PIN #	SIGNALS FD/F
1	VCC	2	IDXN
3	VCC	4	FDDS1N
5	VCC	6	CHGN
7	NC	8	NC
9	NC	10	FDMO1N
11	NC	12	DIRCN
13	NC	14	STEPN
15	GND	16	WDN
17	GND	18	FDWEN
19	GND	20	TR00N
21	GND	22	FDWPN
23	GND	24	RDDN
25	GND	26	FDHSN

Floppy Disk 2

PIN #	SIGNALS FD	PIN #	SIGNALS FD
1	GND	2	DRV DEN0N
3	GND	4	NC
5	KEY	6	NC
7	GND	8	IDXN
9	GND	10	NC
11	GND	12	FDDS1N
13	GND	14	NC
15	GND	16	FDMO1N
17	GND	18	DIRCN
19	GND	20	STEPN
21	GND	22	WDN
23	GND	24	FDWEN
25	GND	26	TR00N
27	GND	28	FDWPN
29	NC	30	RDDN
31	GND	32	FDHSN
33	GND	34	CHGN

Hard Disk (Local Bus IDE) Primary

This is a 2 x 22 header, 2 mm.

PIN #	SIGNALS IDE1	PIN #	SIGNALS IDE1
1	IDERESN	2	GND
3	PIDED7	4	PIDED8
5	PIDED6	6	PIDED9
7	PIDED5	8	PIDED10
9	PIDED4	10	PIDED11
11	PIDED3	12	PIDED12
13	PIDED2	14	PIDED13
15	PIDED1	16	PIDED14
17	PIDED0	18	PIDED15
19	GND	20	KEY
21	PDREQ	22	GND
23	PIDWN	24	GND
25	PIDRN	26	GND
27	PIODY	28	GND
29	PDACKN	30	GND
31	IRQ14	32	HIGH
33	PIDA1	34	P66DET
35	PIDA0	36	PIDA2
37	PCS1N	38	PCS3N
39	LEDHD	40	GND
41	VCC	42	VCC
43	GND	44	NC

Hard Disk (Local Bus IDE) Secondary

This is a 2 x 20 header, 2, 54 mm.

PIN #	SIGNALS IDE2	PIN #	SIGNALS IDE2
1	IDERESN	2	GND
3	SIDED7	4	SIDED8
5	SIDED6	6	SIDED9
7	SIDED5	8	SIDED10
9	SIDED4	10	SIDED11
11	SIDED3	12	SIDED12
13	SIDED2	14	SIDED13
15	SIDED1	16	SIDED14
17	SIDED0	18	SIDED15
19	GND	20	KEY
21	SDREQ	22	GND
23	SIDWN	24	GND
25	SIDRN	26	GND
27	SIODY	28	LOW
29	SDACKN	30	GND
31	IRQ15	32	HIGH
33	SIDA1	34	S66DET
35	SIDA0	36	SIDA2
37	SCS1N	38	SCS3N
39	LEDHD2	40	GND
41	VCC	42	VCC
43	GND	44	NC

Parallel Interface

This is a 2 x 13 pin header.

PIN #	SIGNALS LPT	PIN #	SIGNALS LPT
1	STROBEN	2	AUTOFN
3	PAR D0	4	ERRORN
5	PAR D1	6	INITN
7	PAR D2	8	SLCTIN
9	PAR D3	10	GND
11	PAR D4	12	GND
13	PAR D5	14	GND
15	PAR D6	16	GND
17	PAR D7	18	GND
19	ACKN	20	GND
21	PBUSY	22	GND
23	PE	24	GND
25	SLCT	26	P5V

CRT-Adapter

This is a 2 x 8 pin Berg Header.

PIN #	SIGNALS CRT	PIN #	SIGNALS CRT
1	COGRT	2	VCC
3	COGGN	4	VCC
5	COGBL	6	KEY
7	GND	8	CRTPRN
9	DDCSDA	10	GND
11	CHSYNC	12	RTGND
13	CVSYNC	14	GNGND
15	DDCSCL	16	BLGND

LAN-Adapter

X40 , 2 x 9 pin Berg Header

PIN #	SIGNALS LAN	PIN #	SIGNALS LAN
1	P3VSB	2	LANRXD1
3	KEY	4	LANRXD2
5	LANCLK	6	LANTXD0
7	LRSTSYNC	8	LANTXD1
9	LANRXD0	10	LANTXD2
11	EECLK	12	EEDOUT
13	EESEL	14	EEDIN
15	KEY	16	GND
17	SMBCL	18	SMBDA

LCD-TFT Adapter (PanelLink Bridge)

This is a 2 x 22 pin Berg Header.

PIN #	SIGNALS TFT	PIN #	SIGNALS TFT
1	P12V	2	P12V
3	TXD1/2/5	4	RXDT
5	SPK	6	P3V3C
7	SLSTALL	8	VCC
9	V15COR	10	VCC
11	3VFPSCl	12	LTVDAT4
13	3VFPsDA	14	LTVDAT5
15	KEY	16	GND
17	FPBLKN#	18	GND
19	PCIRST#	20	GND
21	KEY	22	GND
23	LTVDAT0	24	GND
25	LTVDAT1	26	GND
27	LTVDAT2	28	GND
29	LTVDAT3	30	GND
31	LTVDAT6	32	KEY
33	LTVDAT7	34	NC
35	LTVDAT8	36	FPPRN
37	LTVDAT9	38	FPVSYNC
39	LTVDAT10	40	FPHSYNC
41	LTVDAT11	42	N12V
43	FPCLK0	44	FPCLK1

COM3*/COM4* Adapter

This is a 2 x 13 pin Berg Header.

PIN #	SIGNALS	PIN #	SIGNALS
1	P12V	2	N12V
3	P5V	4	GND
5	DTR3N	6	RXD33
7	RI3N	8	DCD3N
9	TXD33	10	RTS3N
11	DSR3N	12	CTS3N
13	DTR4N	14	RXD44
15	USBM2	16	CUSB2N
17	RI4N	18	DCD4N
19	RTS4N	20	TXD44
21	CTS4N	22	DSR4N
23	NC	24	KEY
25	USBP2	26	CUSB2P

USBPLUS Adapter

X122 , 2 x 22 pin Berg Header

PIN #	SIGNALS	PIN #	SIGNALS
1	P12V	2	P24V
3	12V	4	P24V
5	P12V	6	P24V
7	P12V	8	P24V
9	P12V	10	P24V
11	P12V	12	P24V
13	P12V	14	P24V
15	P12V	16	P24V
17	VCC	18	NC
19	VCC	20	KEY
21	NC	22	NC
23	COVL3	24	USBP3
25	COVL2	26	USBM3
27	VCC	28	GND
29	VCC	30	GND
31	VCC	32	GND
33	USBP4	34	GND
35	USBM4	36	GND
37	VCC	38	GND
39	VCC	40	GND
41	USBP2	42	CUSBP2
43	USBM2	44	CUSBM2

USB 5,6

This is a 2 x 4-pin header.

PIN #	SIGNALS USB5	PIN #	SIGNALS USB6
1	VCC	2	GND
3	USBP5	4	USBM6
5	USBM5	6	USBP6
7	GND	8	VCC

PS/2 MOUSE

This is a 1 x 4-pin header.

PIN #	SIGNALS PS/2
1	GND
2	MSCKF
3	MSDAF
4	P5VFKY

Riser Card

This is a 202-pin EISA Standard edge connector.

PIN #	SIGNALS A S	SIGNALS B
1	NC	GND
2	NC	NC
3	NC	VCC
4	NC	NC
5	NC	NC
6	NC	NC
7	NC	N12V
8	NC	NC
9	NC	P12V
10	NC	GND
11	NC	NC
12	NC	NC
13	NC	NC
14	NC	NC
15	NC	NC
16	NC	NC
17	NC	NC
18	NC	NC
19	NC	NC
20	NC	NC
21	NC	NC
22	NC	NC
23	NC	NC
24	NC	NC
25	NC	NC
26	NC	NC
27	NC	NC
28	NC	NC
29	NC	NC
30	NC	VCC
31	NC	NC
32	NC	GND

PIN #	SIGNALS C	SIGNALS D
1	NC	NC
2	NC	NC
3	NC	NC
4	NC	NC
5	NC	NC
6	NC	NC
7	NC	NC
8	NC	NC
9	NC	NC
10	NC	NC
11	NC	NC
12	NC	NC
13	NC	NC
14	NC	NC
15	NC	NC
16	NC	VCC
17	NC	NC
18	NC	GND

PIN #	SIGNALS E	SIGNALS F
1	P3V3 *	P3V3 *
2	P3V3 *	PIRQ1N
3	P3V3 *	PIRQ0N
4	P3V3 *	GND
5	P3V3 *	PCK2
6	KEY	KEY
7	PREQ3N	PCK1
8	GND	GND
9	GND	PREQ2N
10	PCIRSTN	PREQ1N
11	PGNT2N	AD31
12	PGNT1N	AD29
13	GND	GND
14	AD30	AD27
15	VCC	AD25
16	KEY	KEY
17	AD28	VCC
18	AD26	CBE0N
19	GND	AD23
20	AD24	GND
21	VCC	AD21
22	AD22	AD19
23	AD20	VCC
24	GND	AD17
25	KEY	KEY
26	AD18	CBE1N
27	AD16	GND
28	PGNT3N	IRDYN
29	FRAMEN	PIRQ2N
30	TRDYN	DEVSELN
31	GND	GND

PIN #	SIGNALS G	SIGNALS H
1	STOPN	PLOCKN
2	WOLN	PERRN
3	GND	PIRQ3N
4	PAR	SERRN
5	AD15	P5VSB
6	KEY	KEY
7	PCK3	CBE2N
8	AD13	AD14
9	AD11	AD12
10	AD9	AD10
11	CBE3N	GND
12	VCC	AD8
13	AD6	AD7
14	AD4	VCC
15	KEY	KEY
16	VCC	AD5
17	AD2	AD3
18	AD0	AD1
19	HIGH	HIGH

PCI Onboard

This is a 80-pin board to board connector.

PIN #	SIGNALS PCI	PIN #	SIGNALS PCI
1	P12V	2	P12V
3	P3V3C	4	WOLN
5	VCC	6	P5VSB
7	PCK4	8	PIRQ3N
9	PIRQ1N	10	PIRQ2N
11	PIRQ0N	12	PCIRNB
13	PREQ0N	14	PREQ0N
15	GND	16	GND
17	AD31	18	AD30
19	AD29	20	AD28
21	VCC	22	VCC
23	GND	24	GND
25	AD27	26	AD26
27	AD25	28	AD24
29	CBE3N	30	AD23
31	AD21	32	AD22
33	GND	34	GND
35	AD19	36	AD20
37	AD17	38	AD18
39	PCK5	40	AD16
41	FRAMEN	42	GND
43	GND	44	CBE2N
45	TRDYN	46	IRDYN
47	DEVSELN	48	STOPN
49	PERRN	50	VCC
51	VCC	52	GND
53	GND	54	SERRN
55	PAR	56	CBE1N
57	AD15	58	AD14
59	AD13	60	GND
61	GND	62	AD12
63	AD11	64	AD10
65	AD9	66	AD8
67	CBE0N	68	AD6
69	AD7	70	GND
71	RXDTP	72	AD4
73	AD5	74	AD2
75	AD3	76	AD0
77	AD1	78	TXD1/2/5
79	VCC	80	VCC

Speaker

This is a dubox header.

PIN #	SIGNALS SP
1	SPK
2	GND
3	RSVB
4	VCC

Power Supply Unit

This is a 2 x 10-pin header

PIN #	SIGNALS POW1	PIN #	SIGNALS POW1
1	PWGOOD	2	AKOFFN
3	P12V	4	P12V
5	GND	6	GND
7	N5V	8	N12V
9	DCFAILN	10	KEY
11	VCC	12	P5VSB
13	VCC	14	VCC
15	GND	16	GND
17	GND	18	PWRONN
19	QCN	20	AKLOW

The 2 x 9-pin header.

PIN #	SIGNALS POW2	PIN #	SIGNALS POW2
1	GND	2	GND
3	GND	4	GND
5	KEY	6	P3V3C
7	P3V3C	8	P3V3C
9	P3V3C	10	P3V3C
11	KLA2N	12	KLA1N
13	KLE2N	14	KLE1N
15	FANCON	16	FANRPM
17	VCC	18	VCC

The 2 x 2-pin header.

PIN #	SIGNALS POW3	PIN #	SIGNALS POW3
1	GND	2	GND
3	P12V	4	P12V

Power On

The 1 x 4-pin header.

PIN #	SIGNALS PWON
1	GND
2	NC
3	PWRBTN
4	NC

Status Display

This is a 1 x 4-pin dubox header.

PIN #	SIGNALS LED
1	LEDSTB
2	NC
3	LEDHD
4	VCC

L12V – FAN1

This is 1 x 3-pin header

PIN #	SIGNALS L12V
1	GND
2	FANO
3	FANCPU1

L12V – FAN2

This is a 1 x 3-pin header

PIN #	SIGNALS L12V
1	GND
2	FANO
3	FANCPU2

CD-Audio

This is a 1 x 4-pin header.

PIN #	SIGNALS CD
1	AGND
2	CDIL
3	AGND
4	CDIR

LINE IN

This is a 1 x 3-pin header.

PIN #	SIGNALS CD
1	LIL
2	LIR
3	AGND

Gameport

This is a 2 x 8-pin header.

PIN #	SIGNALS GP	PIN #	SIGNALS GP
1	P5VFUS1	2	P5VFUS1
3	GP4	4	GP6
5	J1X	6	J2X
7	GND	8	NC
9	KEY	10	J2Y
11	J1Y	12	GP7
13	GP5	14	NC
15	P5VFUS1	16	KEY

BIOS Setup

The Celeron / Pentium 4 mainboard comes with a Phoenix BIOS chip that contains the ROM Setup information of your system. This chip serves as an interface between the processor and the rest of the mainboard's components. This section explains the information contained in the Setup program and tells you how to modify the settings according to your system configuration.

Even if you are not prompted to use the Setup program, you might want to change the configuration of your system in the future. For example, you may want to enable the Security Password Feature or make changes to the power management settings. It will then be necessary to reconfigure your system using the BIOS Setup program so that the system can recognize these changes and record them in the CMOS RAM or the FLASH ROM.

Standard BIOS Version

The BIOS ROM of the system holds the Setup utility. When you turn on the system, it will provide you with the opportunity to run this program. This appears during the Power-On Self Test (POST). Press <F2> to call the Setup utility. If you are a little bit late pressing the mentioned key, POST will continue with its test routines, thus preventing you from calling Setup. If you still need to call Setup, reset the system by pressing <Ctrl> + <Alt> + <Delete>. You can also restart by turning the system off and then on again. But do so only if the first method fails.

The Setup program has been designed to make it as easy as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

When you invoke Setup, the main program screen will appear. On the following pages you will read more information about the Setup entries.

➔ **Because the BIOS software is constantly being updated, the following BIOS screens and descriptions are for reference purposes only and may not reflect your BIOS screens exactly.**

BIOS Menu Bar

The top of the screen has a menu bar with the following sections:

INFO	Use this menu for information only
MAIN	Use this menu to make changes to the basic system configuration.
ADVANCED	Use this menu to enable and make changes to the advanced features.
SECURITY	Use this menu to enable a supervisor password.
POWER	Use this menu to configure and enable Power Management features.
BOOT	Use this menu to configure the default system device used to locate and load the Operating System.
EXIT	Use this menu to exit the current menu or specify how to exit the Setup program.

To access the menu bar items, press the right or left arrow key on the keyboard until the desired item is highlighted.

Legend Bar

At the bottom of the Setup screen you will notice a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding alternatives and functions.

Navigation Key(s)	Function Description
<F1>	Displays the General Help screen from anywhere in the BIOS Setup.
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu.
← or → (keypad arrows)	Select the menu item to the left or right.
↑ or ↓ (keypad arrows)	Moves the highlight up or down between fields.
- (minus key)	Scrolls backward through the values for the highlighted field.
+ (plus key) or spacebar	Scrolls forward through the values for the highlighted field.
<Enter>	Brings up a selection menu for the highlighted field.
<Home> or <PgUp>	Moves the cursor to the first field.
<End> or <PgDn>	Moves the cursor to the last field.
<F9>	Loads the default configuration into Setup.
<F10>	Saves changes and exits Setup.

General Help

In addition to the Item Specific Help window, the BIOS setup program also provides a General Help screen. This screen can be called from any menu by simply pressing <F1> or the <Alt> + <H> combination. The General Help screen lists the legend keys with their corresponding alternates and functions.

Scroll Bar

When a scroll bar appears to the right of a help window, it indicates that there is more information to be displayed that will not fit in the window. Use <PgUp> and <PgDn> or the up and down keys to scroll through the entire help document.

Press <Home> to display the first page, press <End> to go to the last page. To exit the help window, press <Enter> or <Esc>.

Sub-Menu

Note that a right pointer symbol appears to the left of certain fields. This pointer indicates that a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. To call a sub-menu, simply move the highlight to the field and press <Enter>. The sub-menu then will appear immediately. Use the legend keys to enter values and move from field to field within a sub-menu just as you would do within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with each of the legend keys and their corresponding functions. Practice navigating through the various menus and sub-menus. If you accidentally make unwanted changes to any of the fields, use the set default hot key <F9>. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right side of each menu. This window displays the help text for the currently highlighted field.

Info screen

When the Setup program is accessed, the following screen appears:

Productname:	E1-CPU-Standard
Biosversion:	xx/yy mm/dd/yyyy
System:	----- ----- ----- -----
Mainboard:	----- ----- ----- -----
PowerSupply:	----- ----- ----- -----

This screen is for information only. There is nothing that could be changed within Setup. All informations are intended to facilitate support of your system.

Productname:

This text is fixed for your Celeron / Pentium 4 mainboard with standard BIOS. This board is also called "E1-CPU-Standard".

Biosversion:

The Biosversion is displayed in the release format xx/yy, followed by date of release in international format.

System, Mainboard, PowerSupply:

The default placeholders may be replaced by specific data from factory, describing configuration, serialnumber etc. for each device.

Main Menu

System Time:	[08:14:46]
System Date:	[07/14/2004]
Legacy Diskette A:	[1.44 MB 3 1/2"]
➤ Primary Master	[1090MB]
➤ Primary Slave	[None]
➤ Secondary Master	[None]
➤ Secondary Slave	[None]
Extended Memory:	125 MB

System Time [XX:XX:XX]

Sets your system to the time that you specify (usually the current time). The format is hour, minute, second. Valid values for hour, minute, and second are: Hour: (00 to 23), Minute: (00 to 59), Second: (00 to 59). Use the <Tab> or <Shift> + <Tab> keys to move between the hour, minute, and second fields.

System Date [XX/XX/XXXX]

Sets your system to the date that you specify (usually the current date). The format is month, day, year. Valid values for month, day, and year are: Month: (1 to 12), Day (1 to 31), Year: (up to 2079). Use the <Tab> or <Shift> + <Tab> keys to move between the month, day, and year fields.

Legacy Diskette A [1.44M 3.5"]

These fields record the types of floppy disk drives installed in your system. Configuration options: [Disabled] [720K, 3.5 in.] [1.44M, 3.5in.]

Primary & Secondary Master/Slave

- ➔ **Note:** Before attempting to configure a hard disk drive, make sure you have the configuration information supplied by the manufacturer of the drive. Incorrect settings may cause your system not to recognize the installed hard disk. To allow the BIOS to detect the drive type automatically, select [Auto].

Type:	[Auto]
LBA Format	
Total Sectors	39102336
Maximum Capacity	20020MB
Multi-Sector Transfers:	[16 Sectors]
LBA Mode Control:	[Enabled]
32 Bit I/O:	[Disabled]
Transfer Mode:	[FPIO 4/DMA 2]
Ultra DMA Mode	[Mode 2]
SMART Monitoring	[Disabled]

Type [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, the correct values will be filled in for the remaining fields on this sub-menu. If automatic detection fails, your hard disk drive may be too old or too new. You can try updating your BIOS or enter the IDE hard disk drive parameters manually.

- ➔ After the IDE hard disk drive information has been entered into BIOS, new IDE hard disk drives must be partitioned (e.g. with FDISK) and then formatted before data can be read from and written to. Primary IDE hard disk drives must have its partition set to active (also possible with FDISK).

Other options for the Type field are: [None] to disable IDE devices.

IMPORTANT: If your hard disk was already formatted on an older previous system, incorrect parameters may be detected. You will need to enter the correct parameters manually or use low-level format if you do not need the data stored on the hard disk. If the parameters listed differ from those used when the disk was formatted, the disk will not be readable. If the autodetected parameters do not match those that should be used for your disk you should enter the correct ones manually by setting [User].

[User]

Manually enter the number of cylinders, heads and sectors per track for your drive. Refer to your drive documentation or to the label on the drive. If no drive is installed or if you are removing a drive and not replacing it, select [None].

Cylinders

This field configures the number of cylinders. Refer to your drive documentation to determine the correct value to enter into this field.

➔ To make changes to this field, the Type field must be set to [User].

Heads

This field configures the number of read/write heads. Refer to your drive documentation to determine the correct value to enter into this field.

➔ To make changes to this field, the Type field must be set to [User].

Sector

This field configures the number of sectors per track. Refer to your drive documentation to determine the correct value to enter into this field.

➔ To make changes to this field, the Type field must be set to [User].

Maximum Capacity

This field shows the drive's maximum capacity calculated automatically by the BIOS from the drive information you entered.

Multi-Sector Transfers [Maximum]

This option automatically sets the number of sectors per block to the highest number supported by the drive. This field can also be configured manually. Note that when this field is configured automatically, the value set may not always be the fastest value for the drive. Refer to the documentation that came with your hard drive to determine the optimal value and set it manually.

➔ To make changes to this field, the Type field must be set to [User]. Configuration options: [Disabled] [2 Sectors] [4 Sectors] [8 Sectors] [16 Sectors].

LBA Mode Control [Enabled]

Select the hard disk drive type in this field. When Logical Block Addressing is enabled, 28-bit addressing of the hard drive is used without regard to cylinders, heads, or sectors. Note that Logical Block Access may decrease the access speed of the hard disk. However, LBA Mode is necessary for drives with more than 504MB of storage capacity. Configuration options: [Enabled] [Disabled].

32 Bit I/O [Disabled]

This field setting enables or disables the 32 Bit IDE data transfers. Configuration options: [Disabled] [Enabled].

Transfer Mode

This option lets you set a PIO (Programmed Input/Output) mode for the IDE device. Modes 0 through 4 provide successively increased performance. Configuration options: [Standard] [Fast PIO 1] [Fast PIO 2] [Fast PIO 3] [Fast PIO 4] [FPIO 3 / DMA 1] [FPIO 4 / DMA 2].

Other options for Type are:

- [CD-ROM] for IDE CD-ROM drives

After using the legend keys to make your selections in this sub-menu, press the <Esc> key to exit back to the Main menu. When the Main menu appears, you will notice that the drive size is indicated in the field for the hard disk drive that you just configured.

SMART Monitoring

This field informs about the enabling of the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system which utilizes internal hard disk drive monitoring technology. This field is read only.

Extended Memory: XXX MB

This field displays the amount of extended memory detected by the system during bootup. You do not need to make changes to this field. This is a display only field.

Advanced Menu

Reset Configuration Data:	[No]
Speaker Volume	[High]
PS/2 Mouse:	[Enabled]
Large Disk Access Mode:	[DOS]
Legacy USB Support:	[Disabled]
USB TimeOut Value:	[High]
Onboard LAN BootProm:	[Enabled]
QuickBoot Mode:	[Disabled]
Video output to COM3:	[Disabled]
➤ Chipset Configuration	
➤ I/O Device Configuration	
➤ DMI Event Logging	

Reset Configuration Data [No]

[Yes] erases all configuration data in a section of memory for ESCD (Extended System Configuration Data) which stores the configuration settings for non-PnP Plug-in devices. Configuration options: [No] [Yes]

➔ If you are facing problems after adding or removing any hardware components to the system it might be wise to select the [Yes] option once. This allows the BIOS to reconfigure available hardware resources.

Speaker Volume [High]

This field is for the volume control of the installed speaker. Configuration options [High] [Middle] [Low].

PS/2 Mouse [Enabled]

With the default setting IRQ12 will be reserved for installed expansion cards. [Enabled] will always reserve IRQ12, regardless whether a PS/2 mouse is detected or not. Configuration options: [Disabled] [Enabled]

Large Disk Access Mode [DOS]

For UNIX, Novell Network, or other operating systems you have to select [Other]. For DOS or Windows use the value of default [DOS]. Configuration options: [DOS] [Other].

Legacy USB Support [Disabled]

This motherboard supports Universal Serial Bus (USB) devices. The default of [Disabled] the USB controller is disabled no matter whether you are using a USB device or not. The enabling of the controller will run with the help of a USB compliant operating system like Windows XP or else. If the point stands on [Enabled] the legacy USB support from the BIOS is started. Now it is possible to use a USB keyboard to start this setup or with the standard DOS environment. If you like to use a USB-Floppy disk or a USB CD-ROM device for booting, you have to enable this setup point and after detecting of this USB device from the BIOS, you have to switch the boot order to the appropriate device.
Configuration Options: [Disabled] [Enabled]

➔ **Note:** Selecting Legacy USB Support [Disabled] has impact on “Boot Order” in “BOOT” Menu, resetting this field do its default value and locking it. See “Boot Order” description.

USB TimeOut Value [High]

If Legacy USB Support [Enabled] you can select USB TimeOut Value [High], [Low]. Connecting an USB-Floppy or any other mechanical driven USB device to USB port needs [High] for proper function. Using a solid state device (i.e. USB CompactFlash) the entry [Low] might be selected, avoiding time delay during booting the system.

Onboard LAN BootProm [Enabled]

This point switches on or off the PXE PROM from the onboard LAN submodul if it is installed. Configuration Options: [Disabled] [Enabled]

QuickBoot Mode [Disabled]

This setup mode speeds up the progress of booting the system a lot.
Configuration Options: [Disabled] [Enabled]

Video output to COM3 [Disabled]

Some systems may be configured without a full screen display, just using a small display connected to the COM3 serial port. [Enabled] will redirect diagnostic information during PowerOnSelfTest to this serial port, giving control about the system to smaller displays as well.

Chipset Configuration

Local Bus IDE adapter:	[Both]
SMART Device Monitoring:	[Disabled]
Boot-Video Device:	[Onboard]
PCI 2.1 Support	[Enabled]
USB 2.0 Support	[Enabled]

Local Bus IDE adapter [Both]

You can select to enable the primary IDE channel, secondary IDE channel, both, or disable both channels.

Configuration options [Both] [Primary] [Secondary] [Disabled]

SMART Device Monitoring [Disabled]

This field controls the enabling of the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system which utilizes internal hard disk drive monitoring technology. Configuration options: [Disabled] [Enabled].

Boot-Video device [Onboard]

The mainboard has an Onboard graphic adapter. If your computer has additionally installed a PCI VGA card additionally installed, this field allows you to select which of the cards will act as your primary display card. The default, [Onboard], allows your PCI card to take precedents only when no onboard bridge is detected. [PCI-Slot] uses the PCI VGA adapter card as primary card. Configuration options: [Onboard] [PCI-Slot].

PCI 2.1 Support [Enabled]

This field only should be [Disabled], if any PCI card in your system does not work properly; this means running PCI cards with less performance.

USB 2.0 Support [Enabled]

Using USB devices complying 2.0 standard, you may let this field [Enabled]. Due to lack of appropriate drivers you may switch to [Disabled].

I/O Device Configuration

Parallel port:	[Enabled]
Mode:	[ECP]
Base I/O address:	[378]
Interrupt:	[IRQ 7]
DMA channel:	[DMA 1]
TouchScreen Routing:	[No Routing]
Game port:	[Enabled]
Base I/O address/IRQ	[200]

Parallel port [Enabled]

Switch Parallel Port on or off. If selecting [Auto], the BIOS or Operating System will configure this port. Selecting [Enabled] you are able to define configuration by yourself. Configuration options: [Disabled] [Enabled] [Auto].

Mode [Bi-directional]

This field allows you to set the operation mode of the parallel port.

Configuration options: [Output only] [Bi-directional] [EPP] [ECP]

Base I/O address

This field sets the address for the onboard parallel connector in [Enabled] mode. Configuration options: [378] [278].

Interrupt

Combine the Base I/O address with an interrupt in [Enabled] mode. Configuration options: [IRQ 5] [IRQ 7]

DMA channel

Combine the Base I/O address with an DMA channel in [Enabled] mode. Configuration options: [DMA 1] [DMA 3]

TouchScreen Routing [No Routing]

Using a TouchScreen you may select routing it to a serial interface using hardware lines instead of COM1 or COM2.

Configuration Options: [No Routing] [TFT Touch to COM1] [TFT Touch to COM2] .

Game port [Enabled]

Switch Game port on or off. If selecting [Auto], the BIOS or Operating System will configure this port. Selecting [Enabled] you are able to define configuration by yourself. Configuration options: [Disabled] [Enabled] [Auto].

Base I/O address

This field sets the address for the Game port in [Enabled] mode.

Configuration options: [200] [210] [220] [230].

DMI Event Logging

Event log capacity	Space available
Event log valid	Valid
View DMI event log	[Enter]
Clear all DMI event logs	[No]
Event Logging	[Enabled]
Mark DMI events as read	[Enter]

Desktop Management Interface (DMI) is a method of managing computers in an enterprise. Using DMI, a system administrator can obtain the types, capabilities, operational status, installation date and other information about the system components. An event log is a fixed-length area within a non-volatile storage element.

View DMI event log [Enter]

This setup point is useful to display the recorded DMI events like a defect floppy disk controller or anything else. If there is an error stored, the BIOS will display a message every time the system is starting up.

Clear all DMI event logs [No]

With this point it is possible to clear all the recorded DMI events manually.

Event logging [Enabled]

If you do not use the DMI event logging, it is possible to shut off the recording mechanism of errors.

Mark DMI events as read [Enter]

If you dislike the BIOS message at system starting up but you like to have the errors recorded, mark all DMI events as read. With the next start up of the system, the BIOS would not display a message.

Security Menu

Supervisor Password Is:	Clear
Set Supervisor Password	[Enter]

Set Supervisor Password

This field allows you to set the password. Highlight the field and press <Enter>. Type a password and press <Enter>, you can type up to eight alphanumeric characters. Symbols and other characters are ignored. To confirm the password, type the password again and press <Enter>. The password is now set to [Enabled]. This password allows full access to the BIOS Setup menu. To clear the password, highlight this field and press <Enter>. The same dialog box as above will appear. Press <Enter> and the password will be set to [Disabled].

Power Menu

The Power menu allows you to reduce power consumption. This feature turns off the video display and shuts down the hard disk after a period of inactivity.

Power State:	[Stay Off]
Wake On LAN:	[Disabled]
Wake On Modem Ring:	[Disabled]
Wake On Time:	[Disabled]
Wake Time:	[00:00:00]

➤ HardWare Monitor:

Power State [Stay off]

Select whether you want your system to be rebooted after power has been interrupted. [Stay off] leaves your system off and [Restore] reboots your system if it was active before power loss. Is the key [Follow AC/Power] selected, the system will startup anytime power is available. Configuration options: [Stay off] [Restore] [Follow AC/Power].

- ➔ In mode [Follow AC/Power] the front button is disabled. This means that there is no way to force down the system pressing the front button more than 4 seconds, avoiding accidental shutdown.

Wake-on Modes

Please note that the Soft-Off mode is necessary for all Wake-on modes.

Wake-On-LAN [Disabled]

Wake-On-LAN allows your BEETLE to be powered up from Soft-Off Mode. This may be done from another system via a network by sending a wake-up frame or signal. Configuration options: [Disabled] [Enabled].

Wake-On-Modem Ring [Disabled]

This allows to enable or disable powering up the BEETLE when the modem receives a call while the BEETLE is in Soft-Off mode.

- ➔ **NOTE:** The BEETLE cannot receive or transmit data until the system and applications are fully running, thus connection cannot be made on the first try. Turning an external modem off and then back on while the BEETLE is off causes an initialization string that will cause the system to power on. Configuration options: [Disabled] [Enabled].

Wake-On-Time [Disabled]

This allows an unattended or automatic system power up from Soft-Off mode. You may configure your system to power up at a certain time. The wake-up time is to be set in the next field below this field. Configuration options: [Disabled] [Enabled]

Hardware Monitor

CPU Temperature:		44 °C
Fan #1 Speed		4448 rpm
Fan #2 Speed		5480 rpm
Fan #3 Speed		2790 rpm
-12V	Voltage	13.6 V
+12V	Voltage	12.6 V
+VCC	Voltage	5.2 V
+1.5V	Voltage	1.5 V
+2.5V	Voltage	2.6 V
+CpuVID	Voltage	1.3 V
+3.3V	Voltage	3.4 V
+VBatt	Voltage	3.13 V

CPU Temperature [xxC]

The onboard hardware monitor is able to detect the motherboard and CPU temperatures (for supported processors only).

CPU Fan#x Speed (xxxxrpm)

The onboard hardware monitor is able to detect the CPU fan speed and power supply fan speed in rotations per minute (rpm). The presence of the fans is automatically detected.

Several Voltages [xx.xV]

The onboard hardware monitor is able to detect the voltage output by the on-board voltage regulators.

Boot Menu

Boot Order	[Follow Setup Order]
	+Removable Devices
	+Hard Drive
	CD-ROM Drive
	Network Boot
	IBA FE Slot 0140 v4110

The Boot menu allows you to select from the four possible types of boot devices listed using the up and down arrow keys. By using the <+> or <Space> key, you can promote devices and by using the <-> key, you can demote devices. Promotion or demotion of devices alters the priority which the system uses to search for a boot device on system power up.

Boot Order [Follow Setup Order]

The Option [Follow Setup Order] defines the boot order as seen in Setup. Selecting [Override Setup Order] will rearrange the boot order within “+Hard Drive”. as long as any USB-HardDrive is available. Thus you may use memorysticks formatted as HardDrive to boot from, temporary seeing the USB-HardDrive to be placed on the top of boot order in “+Hard Drive”

➔ **NOTE:** Disabling “Legacy USB Support” in Advanced Menu will reset “Boot Order” to [Follow Setup Order] and lock this field. So, if you want to select [Override Setup Order] you must first select [Enabled] for “Legacy USB Support” in Advanced Menu.

Exit Menu

Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes

Once you have made all your selections from the various menus in the Setup program, you should save your changes and exit Setup. Select Exit from the menu bar to display the following menu.

➔ <Esc> does not exit this menu. You must select one of the options from this menu or <F10> from the legend bar to exit this menu.

Exit Saving Changes

Once you have finished making selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the BEETLE is turned off. Once this option is selected, a confirmation is asked. Select [Yes] to save changes and exit.

Exit Discarding Changes

This option should only be used if you do not want to save the changes you have made to the Setup program. If you have made changes to fields other than system date, system time, and password, the system will ask for confirmation before exiting.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menu. When this option is selected or if <F9> is pressed, a confirmation is requested. Select [Yes] to load default values. You can now select Exit Saving Changes or make other changes before saving the values to the non-volatile RAM.

Discard Changes

This option allows you to discard the selections you made and restore the values you previously saved. After selecting this option, a confirmation is requested. Select [Yes] to discard an changes and load the previously saved values.

Save Changes

This option saves your selections without exiting the Setup program. You can then return to other menus to make changes. After selecting this option, all selections are saved and a confirmation is requested. Select [Yes] to save all changes to the non-volatile RAM.

Test points codes

At the beginning of each POST routine, the BIOS outputs the test point error code to I/O port address 80h. Use this code during trouble shooting to establish where the system failed and what routine has been performed.

If the BIOS detects a terminal error condition, it halts POST after issuing a terminal error beep code and attempting to display the error code on the port 80h LED display (diagnostic card). If the system hangs before the BIOS can process the error, the value displayed at the port 80h is the last test performed. In this case, the screen does not display the error code.

The routine derives the beep code from the test point error as follows:

1. The 8-bit error code is broken down to four 2-bit groups.
2. Each group is made one-based (1 through 4) by adding 1.
3. Short beeps are generated for the number in each group.

Example:

Testpoint 1Ah = 00 01 10 10 = 1-2-3-3 beeps

The following is a list of the checkpoint codes written out to the diagnostic port at the start of each test.

The first beep code inside of the BIOS has 1-long and 2-short beeps. This means that there is a problem with the graphic adapter.

POST Code (Hex)	Name	Description
02h	VERIFY_REAL	IF <in port mode> THEN Turn on A20 Reset Processor ENDIF
03h	DISABLE_NMI	Disable non-maskable Interrupts
04h	GET_CPU_TYPE	IF <cold boot> THEN Store reset DX value in CMOS Determine CPU manufacturer and type Store CPU manufacturer and type in CMOS ENDIF
06h	HW_INIT	Reset all DMA controllers. Disable all video controllers. Clear any pending interrupts from the RTC Set up port 61h to speaker off and timer gate enabled.
08h	CS_INIT	Set DRAM controller registers to values that are needed for DRAM discovery and testing.
09h	SET_IN_POST	Set bit in CMOS indicating that POST is in progress. Not cleared until Post Code Aeh.
0Ah	CPU_INIT	Set CPU configuration registers.
0Bh	CPU_CACHE_ON	Turns on the CPU cache.
0Ch	CACHE_INIT	Set L2 cache controller registers to values needed for SRAM discovery and testing.
0Eh	IO_INIT	IF <onboard super I/O exists> THEN Turn Off LPT and COM ports in super I/O. Set I/O controller registers to default values. ENDIF
0Fh	FDISK_INIT	IF <secondary IDE controllers exists> THEN Set secondary IDE controller configuration registers to default values. ENDIF

POST Code (Hex)	Name	Description
10h	PM_INIT	IF <power management enabled> THEN Set the power management configuration registers to default values. ENDIF
11h	REG_INIT	Set Cx5520 configuration registers to default values. Set any other configuration registers to default values.
12h	RESTORE_CR0	Return to real mode.
13h	PCI_BM_RESET	Early reset of PCI devices required to disable bus masters. Assumes the presence of a stack and running from decompressed shadow memory.
14h	8742_INIT	Verify 8742 (keyboard controller) is responding. Improper connections/timing to the 8742. Send self test command to 8742.
16h	CHECKSUM	Checksum the system BIOS ROM IF <checksum is incorrect> THEN Halt. ENDIF
17h	PRE_SIZE_RAM	Initialize external cache before autosizing memory.
18h	TIMER_INIT	Initialize all three of the 8254 timers.
1Ah	DMA_INIT	Initialize the DMA command register and all 8 DMA channels.
1Ch	RESET_PIC	Initialize the 8259 interrupt controller.
20h	REFRESH	Copy test code to RAM and execute that code looking for refresh bit in port 61h to toggle. IF <refresh test failed> THEN Halt. ENDIF
22h	8742_TEST	Read 8742 self-test results. IF <self-test failed> THEN Halt. ELSE Read system info from 8742 Set 8742 command byte. ENDIF

POST Code (Hex)	Name	Description
24h	SET_HUGE_ES	Go into protected mode. Set ES, DS, SS, FS, and GS to 4Gb.
28h	SIZE_RAM	Determine the size of each DRAM bank. Set DRAM controller configuration registers to enable DRAM.
29h	MEM_MGR_INIT	Initialize the POST Memory manager.
2Ah	ZERO_BASE_RAM	Clear the 512k of DRAM.
2Ch	ADDR_TEST	Test for stuck address line in lower 1M of address space, IF <test failed> THEN Halt. ENDIF
2Eh	BASERAML	Test for stuck DRAM data line by walking a 1 through all bit locations of address 0 and then walking a 0 through. IF <test failed> THEN Halt. ENDIF
2Fh	PRE_SYS_SHADOW	Clears the cache before shadowing the system.
32h	COMPUTE_SPEED	Determine the CPU core speed by timing the execution of a loop.
33h	PDM_INIT	Initialize the Phoenix Dispatch Manager.
34h	CMOS_TEST	Clear CMOS diagnostic byte. IF <CMOS battery is dead> THEN Set "bad battery" flag in CMOS IF <CMOS checksum is bad> THEN Set "bad CMOS check" flag in CMOS Checksum CMOS ENDIF ENDIF
36h	CHK_SHUTDOWN	Vector to proper shutdown routine (reset).
38h	SYS_SHADOW	Copy system BIOS ROM to shadow RAM.
3Ah	CACHE_AUTO	Detect the amount of SRAM for the L2 cache. Set L2 cache controller configuration registers to enable SRAM.

POST Code (Hex)	Name	Description
3Ch	ADV_CS_CONFIG	IF <CMOS is valid (checksum good and battery good) THEN Load DRAM controller configuration registers with values from CMOS fields. ENDIF
3Dh	ADV_REG_CONFIG	IF <CMOS is valid> THEN Load ISA controller configuration registers with values from CMOS fields and load any other configuration registers with values from CMOS fields. ENDIF
42h	VECTOR_INIT	Set interrupt vectors 0-77h to BIOS general interrupt handler.
44h	SET_BIOS_INT	Set interrupt vectors 0-20h to correct BIOS interrupt handlers.
45h	CORE_DEVICE_INIT	Initialize all motherboard devices.
46h	COPYRIGHT	Verify that the Phoenix BIOS copyright message is correct.
47h	PCI_OP_INIT	Initialize PCI option ROM manager.
48h	CONFIG	Determine video type to be used and store.
49h	PCI_INIT	Initialize PCI to PCI bridges. Reset all PCI devices. Send self test command to all PCI devices. Configure base registers of all PCI devices.
4Ah	VIDEO	Initialize all MDA video adapters. Initialize all CGA video adapters. Execute VGA option ROMs to initialize VGA adapter. Initialize VSA.
4Bh	QUIETBOOT_START	Initialize Quietboot if installed. Enable IRQ0 and IRQ1.

POST Code (Hex)	Name	Description
4Ch	VID_SHADOW	IF <video shadow enabled in setup> THEN IF <CMOS valid and last boot success- ful> THEN Shadow video BIOS ROM. ENDIF ENDIF
4Eh	CR_DISPLAY	Display the CPU type and speed on the screen.
51h	EISA_INIT	IF <EISA support is enabled> THEN Checksum EISA data NVRAM loca- tions. IF <checksum good> THEN Initialize each slot. ELSE Display bad config message. ENDIF ENDIF
52h	KB_TEST	Check for return code of AA from key- board self-test, IF <return code not AA> THEN Set keyboard error flag ENDIF
54h	KEY_CLICK	IF <keyclick enabled and keyboard good> THEN Initialize key stroke clicker ENDIF
56h	ENABLE_KB	Send command to keyboard controller to enable the keyboard.
58h	HOT_INT	Check for unexpected interrupts. Check for unexpected NMI. Enable parity checkers and check for unexpected NMI.
59h	PDS_INIT	Register POST display services with POST Dispatch Manager.
5Bh	CPU_CACHE_OFF	Disable and WB invalidate CPU cache.
5Ch	MEMORY_TEST	Determine amount of memory below 1M. Walk a1 through data bus at 80000h. walk a 0 through data bus at 80000h. Check for stuck address line from 80000h to 8FFFFh.

POST Code (Hex)	Name	Description
60h	EXT_MEMORY	Determine total amount of memory by doing a read/write test. For each 1M block oh memory: Walk a 1 through data bus at first location of block. Walk a 0 through data bus at first location of block. Check for stuck address line in the block.
62h	EXT_ADDR	Do an extended address line test on the entire memory range.
64h	USERPATCH	Code that is patched into the ROM can be set up to execute at this point.
66h	CACHE_ADVNCD	Load L2 cache controller configuration registers with values from setup screens.
68h	CACHE_CONFIG	Set non-cacheable regions. Enable L1 and L2 caches.
6Ah	DISP_CACHE	IF <cache RAM size not zero> THEN Display L2 cache RAM size on screen. ENDIF
6Ch	DISP_SHADOW	IF <system BIOS ROM shadowed> THEN Display message indicating that the system BIOS ROM is shadowed. ENDIF IF <video BIOS ROM shadowed> THEN Display message indicating that the video BIOS ROM is shadowed. ENDIF
6Eh	DISP_NONDISP	Display the starting address of the non-disposable (run time) BIOS.
70h	ERROR_MSGS	Display error messages for any errors found.
72h	TEST_CONFIG	IF <system configuration error found> THEN Display message indicating configuration error detected. ENDIF

POST Code (Hex)	Name	Description
74h	RTC_TEST	Verify that the RTC is running. IF <RTC not running> THEN Set bit in RTC indicating that the time is invalid. ENDIF
76h	KEYBOARD	IF <keyboard failure detected> THEN Display message indicating keyboard failure. ENDIF
7Ch	HW_INTS	Initialize hardware interrupt vectors 08h-0Fh
7Dh	ISM_INIT	Initialize Intelligent System Monitoring Support.
80h	IO_BEFORE	IF <integrated super I/O exists> THEN Disable LPT and COM ports on integrated super I/O. ENDIF.
81h	CORE_LATE_INIT	Late initialization of devices.
82h	RS232	Identify and test all COM ports.
83h	CONFIG_IDE	Configure Fdisk controller.
84h	LPT	Test and ID parallel ports.
85h	PCI_PCC	Initialize PnP ISA devices.
86h	IO_AFTER	IF <integrated super I/O exists> THEN Set integrated super I/O configuration to match setup. ENDIF
87h	POST_CONFIG_MCD	Initialize Mother Board Configurable devices.
88h	BIOS_INIT	Initialize timeouts, key buffer, soft reset flag.
89h	ENABLE_NMI	Enable NMI.
8Ah	INIT_EXT_BDA	Initialize the extended BIOS data area.
8Bh	MOUSE	IF <mouse support enabled> THEN Setup interrupt vector for mouse. Add mouse support to equipment installed flag. ENDIF

POST Code (Hex)	Name	Description
8Ch	FLOPPY	Test both floppy drives. IF <error detected> THEN Display floppy error message. ENDIF
8Fh	FDISK_FAST_PREINIT	Count and store the number of ATA drives in the subsystem.
90h	FDISK	Initialize the hard disk subsystem and test. IF <error detected> THEN Display hard disk error message. ENDIF
91h	FDISK_FAST_INIT	Set timing based on drives attached.
92h	USERPATCH2	Code that is patched into the ROM can be setup to execute at this point.
93h	MP_INIT	Create the CPU feature table.
94h	DISABLE_A20	Disable the A20 address line.
95h	CD	Validate bootable CD ROM. Prepare CD for CD ROM boot.
96h	CLEAR_HUGE_ES	Store an 8 in the shutdown code byte in CMOS. Reset the processor.
97h	MP_FIXUP	Create pointer to MP table in Extended BDA.
98h	ROM_SCAN	Scan through the ISA option ROM space and jump to each option ROM found. Shadow PCI option ROMs and initialize cards.
9Ah	MISC_SHADOW	Shadow expansion ROM areas that are enabled from setup.
9Ch	PM_SETUP	Setup power management if enabled.
9Dh	SECURITY	Initialize Security Engine.
9Eh	IRQS	Enable IRQ 0, 1, 2, and 6.
9Fh	FDISK_FAST_INIT2	Check and store the total number of Fast Disks (ATA and SCSI).
A0h	TIME_OF_DAY	Verify that the system clock interrupts are occurring.
A2h	KEYBOARD_TEST	Set NumLock indicator. IF <keylock set> THEN Print error message on screen. ENDIF

POST Code (Hex)	Name	Description
A4h	KEY_RATE	Initialize keyboard typematic rate.
AAh	SCAN_FOR_F2	IF <2 key was pressed during POST> THEN Set flag indicating key press. Display "Entering Setup" message. ENDIF
ACh	SETUP_CHECK	IF <2 was pressed> THEN Enter Setup. ELSE IF <errors were found> THEN Display "Press 7 or 2" prompt. IF <2 is pressed> THEN Enter Steup. ELSE IF <7 is pressed> THEN Boot. ENDIF ELSE Boot. ENDIF
AEnh	CLEAR_BOOT	Clear CMOS bit indicating POST is in progress.
B0h	ERROR_CHECK	IF <error were found> THEN Beep twice. Display "Press 7 or 2" message. IF <2 is pressed> THEN Enter Setup. ELSE IF <7 is pressed> THEN Boot. ENDIF ENDIF
B2h	POST_DONE	Change BIOS data areas flag to indicate POST is complete.
B4h	ONE_BEEP	Beep once.
B5h	QUIET-BOOT_END	Reset video: Clear screen, reset cursor, reload DAC.
B6h	PASSWORD	IF <password enabled> THEN Print message requesting password. IF <password incorrect> THEN Halt. ENDIF ENDIF

POST Code (Hex)	Name	Description
B8h	SYSTEM_INIT	Clear the GDT.
B9h	PREPARE_BOOT	Prepare to boot, clear the screen.
BAh	DMI	Initialize DMI header and substructures.
C0h	INT19	Do INT 19h to load OS.

POS Motherboard - user manual beep codes

#	hex code	beep code	#	hex code	beep code	#	hex code	beep code	#	hex code	beep code	#	hex code	beep code	#	hex code	beep code
1	01	1-1-1-2	33	21	1-3-1-2	65	41	2-1-1-2	97	61	2-3-1-2	129	81	3-1-1-2	161	A1	3-3-1-2
2	02	1-1-1-3	34	22	1-3-1-3	66	42	2-1-1-3	98	62	2-3-1-3	130	82	3-1-1-3	162	A2	3-3-1-3
3	03	1-1-1-4	35	23	1-3-1-4	67	43	2-1-1-4	99	63	2-3-1-4	131	83	3-1-1-4	163	A3	3-3-1-4
4	04	1-1-2-1	36	24	1-3-2-1	68	44	2-1-2-1	100	64	2-3-2-1	132	84	3-1-2-1	164	A4	3-3-2-1
5	05	1-1-2-2	37	25	1-3-2-2	69	45	2-1-2-2	101	65	2-3-2-2	133	85	3-1-2-2	165	A5	3-3-2-2
6	06	1-1-2-3	38	26	1-3-2-3	70	46	2-1-2-3	102	66	2-3-2-3	134	86	3-1-2-3	166	A6	3-3-2-3
7	07	1-1-2-4	39	27	1-3-2-4	71	47	2-1-2-4	103	67	2-3-2-4	135	87	3-1-2-4	167	A7	3-3-2-4
8	08	1-1-3-1	40	28	1-3-3-1	72	48	2-1-3-1	104	68	2-3-3-1	136	88	3-1-3-1	168	A8	3-3-3-1
9	09	1-1-3-2	41	29	1-3-3-2	73	49	2-1-3-2	105	69	2-3-3-2	137	89	3-1-3-2	169	A9	3-3-3-2
10	0A	1-1-3-3	42	2A	1-3-3-3	74	4A	2-1-3-3	106	6A	2-3-3-3	138	8A	3-1-3-3	170	AA	3-3-3-3
11	0B	1-1-3-4	43	2B	1-3-3-4	75	4B	2-1-3-4	107	6B	2-3-3-4	139	8B	3-1-3-4	171	AB	3-3-3-4
12	0C	1-1-4-1	44	2C	1-3-4-1	76	4C	2-1-4-1	108	6C	2-3-4-1	140	8C	3-1-4-1	172	AC	3-3-4-1
13	0D	1-1-4-2	45	2D	1-3-4-2	77	4D	2-1-4-2	109	6D	2-3-4-2	141	8D	3-1-4-2	173	AD	3-3-4-2
14	0E	1-1-4-3	46	2E	1-3-4-3	78	4E	2-1-4-3	110	6E	2-3-4-3	142	8E	3-1-4-3	174	AE	3-3-4-3
15	0F	1-1-4-4	47	2F	1-3-4-4	79	4F	2-1-4-4	111	6F	2-3-4-4	143	8F	3-1-4-4	175	AF	3-3-4-4
16	10	1-2-1-1	48	30	1-4-1-1	80	50	2-2-1-1	112	70	2-4-1-1	144	90	3-2-1-1	176	B0	3-4-1-1
17	11	1-2-1-2	49	31	1-4-1-2	81	51	2-2-1-2	113	71	2-4-1-2	145	91	3-2-1-2	177	B1	3-4-1-2
18	12	1-2-1-3	50	32	1-4-1-3	82	52	2-2-1-3	114	72	2-4-1-3	146	92	3-2-1-3	178	B2	3-4-1-3
19	13	1-2-1-4	51	33	1-4-1-4	83	53	2-2-1-4	115	73	2-4-1-4	147	93	3-2-1-4	179	B3	3-4-1-4
20	14	1-2-2-1	52	34	1-4-2-1	84	54	2-2-2-1	116	74	2-4-2-1	148	94	3-2-2-1	180	B4	3-4-2-1
21	15	1-2-2-2	53	35	1-4-2-2	85	55	2-2-2-2	117	75	2-4-2-2	149	95	3-2-2-2	181	B5	3-4-2-2
22	16	1-2-2-3	54	36	1-4-2-3	86	56	2-2-2-3	118	76	2-4-2-3	150	96	3-2-2-3	182	B6	3-4-2-3
23	17	1-2-2-4	55	37	1-4-2-4	87	57	2-2-2-4	119	77	2-4-2-4	151	97	3-2-2-4	183	B7	3-4-2-4
24	18	1-2-3-1	56	38	1-4-3-1	88	58	2-2-3-1	120	78	2-4-3-1	152	98	3-2-3-1	184	B8	3-4-3-1
25	19	1-2-3-2	57	39	1-4-3-2	89	59	2-2-3-2	121	79	2-4-3-2	153	99	3-2-3-2	185	B9	3-4-3-2
26	1A	1-2-3-3	58	3A	1-4-3-3	90	5A	2-2-3-3	122	7A	2-4-3-3	154	9A	3-2-3-3	186	BA	3-4-3-3
27	1B	1-2-3-4	59	3B	1-4-3-4	91	5B	2-2-3-4	123	7B	2-4-3-4	155	9B	3-2-3-4	187	BB	3-4-3-4
28	1C	1-2-4-1	60	3C	1-4-4-1	92	5C	2-2-4-1	124	7C	2-4-4-1	156	9C	3-2-4-1	188	BC	3-4-4-1
29	1D	1-2-4-2	61	3D	1-4-4-2	93	5D	2-2-4-2	125	7D	2-4-4-2	157	9D	3-2-4-2	189	BD	3-4-4-2
30	1E	1-2-4-3	62	3E	1-4-4-3	94	5E	2-2-4-3	126	7E	2-4-4-3	158	9E	3-2-4-3	190	BE	3-4-4-3
31	1F	1-2-4-4	63	3F	1-4-4-4	95	5F	2-2-4-4	127	7F	2-4-4-4	159	9F	3-2-4-4	191	BF	3-4-4-4
32	20	1-3-1-1	64	40	2-1-1-1	96	60	2-3-1-1	128	80	3-1-1-1	160	A0	3-3-1-1	192	C0	4-1-1-1

Abbreviations

AGTL+	Assisted Gunning Transceiver Logic
APC	Advanced Power Control
PM	Advanced Power Management
AT	Advanced Technology
ATA	AT Attachment
BGA	Ball Grid Array
BIOS	Basic Input and Output System
CPLD	Complex Programmable Logic Device
CPU	Central Processing Unit
CRT	Cathode-ray Tube
DIMM	Dual Inline Memory Modul
DVI	Digital Video Interface
ECP	Extended Capabilities Port
EEPROM	Electrical Erasable Read Only Memory
E-IDE	Enhanced Integrated Drive Electronics
EMS	Expanded Memory System
EPP	Enhanced Parallel Port
FSB	Front Side Bus
GTL	Gunning Transceiver Logic
IDE	Integrated Drive Electronics
LAN	Local Area Network
LCD	Liquid Crystal Display
NA	Power failure
NVRAM	Non-volatile Random Access Memory
POS	Point of Sales
PCI	Peripheral Component Interconnect
PnP	Plug and Play
RI	Ring Indicator
RS	Retail Systems
SMI	System Management Interrupt
SMM	System Management Mode
SMRAM	System Management RAM
SPGA	Staggered Pin Grid Array
TFT	Thin-film transistor
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
VGA	Video Graphics Array
WOL	Wake On LAN
WOM	Wake On Modem

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