WINCOR NIXDORF

BEETLE

POS Motherboard

With Intel Celeron Processor /
Intel Pentium III Processor (D2-CPU)

User Manual

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User Manual

Edition August 2003

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Introduction

This manual describes the features of the Central Processing Unit (CPU) for the BEETLE POS systems based on the Intel Celeron™ Processor family and the Intel Pentium III™ processor. With a frequency from 566 MHz up to 1.2 GHz (Celeron), from 600 MHzup to 1.26 GHz (Pentium III), second level cache and many other features, these processors guarantee an increased performance of your BEETLE POS system. The modular concept guarantees that both, COM ports and USB ports, are available alternatively.

Overview

Microprocessor	Support for the following processors: • Intel® Pentium®III processor with 100 MHz or 133 MHz host bus speed • Intel® Celeron™ processor with 66 MHz host bus speed
Main Memory	Two 168-pin dual in line memory module (DIMM) sockets Supports up to 512MB of PC100 (100MHz) or PC133 (133MHz) Modules
Chipset	Intel® Chipset 815E, consisting of: • Intel® FW82815 • Intel® 82801 BA
PCI-ISA Bridge	ITE Bridge IT8888F
I/O Controller	ITE I/O Cntrl. IT8712F, consisting of: • Floppy controller • Parallel port • 2 Serial Ports • Keyboard Interface • PS/2 Mouse Interface • HW-Monitor

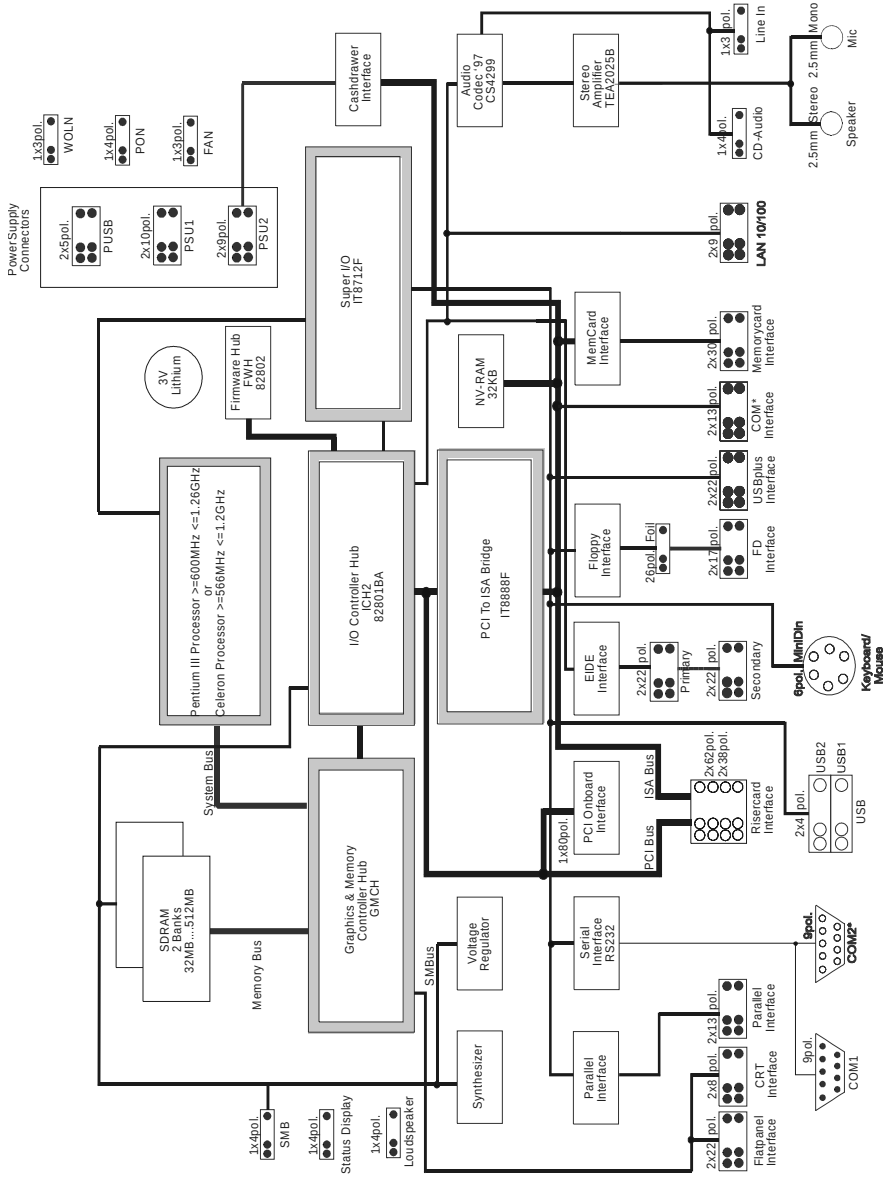
Video system	Video Memory part of main memory (max. 10MB under Windows) including 4MB pixel memory **CRT** resolution up to: • 1600 x 1200 pixel / 8 bit color • 1280 x 1024 pixel / 24 bit color • 1024 x 768 pixel / 24 bit color **TFT** resolution up to: • 1280 x 1024 pixel / 24 bit color
Audio system	Chrystal Audio Codec CS4299 Mono Microphone Input Stereo Speaker Output (2 x 1,25W @ 8Ohm)
BIOS	Firmware Hub: 4 Mbit 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) USB ports • Two IDE interfaces with Ultra DMA support • One FD interface
Plug-in Modules	• COM3*,4* adapter • 12V version USB adapter • 24V version USB adapter • CRT adapter • LAN adapter • Panellink Bridge • VGA/4 PCI controller • LAN PCI controller
Additional Features	• Power USB with 12V and/or 24V • Wake On LAN technology • Wake On Modem • Wake On time

Block Diagrams

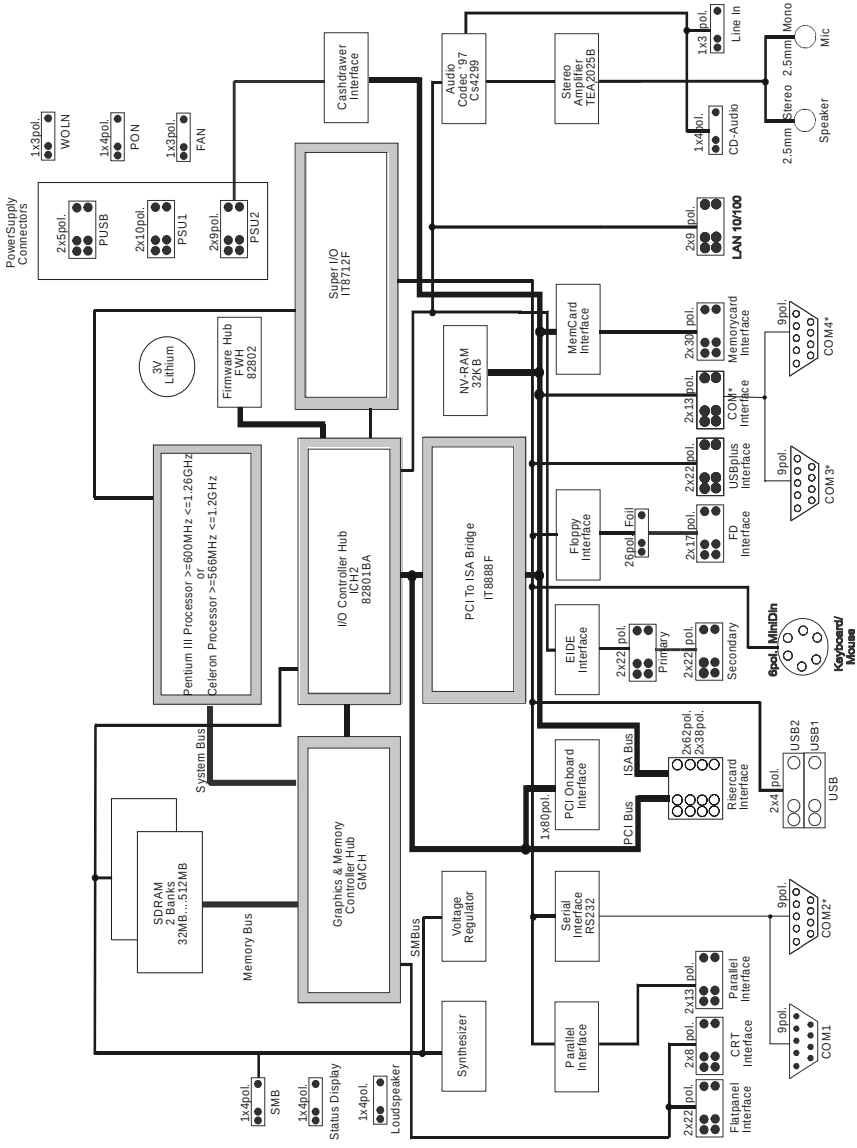
The block diagrams show all of the functional units of the D2 - CPU. The physical plug-in connections to the system and external peripherals are shown at the bottom of the diagram. Only the most important internal connectors are part of the block diagram (see next pages).

Diagram 1 shows the mainboard w/o additional serial interfaces.
Diagram 2 shows the mainboard with COM3*, COM4* interface.
Diagram 3 shows the mainboard with USBplus interface.

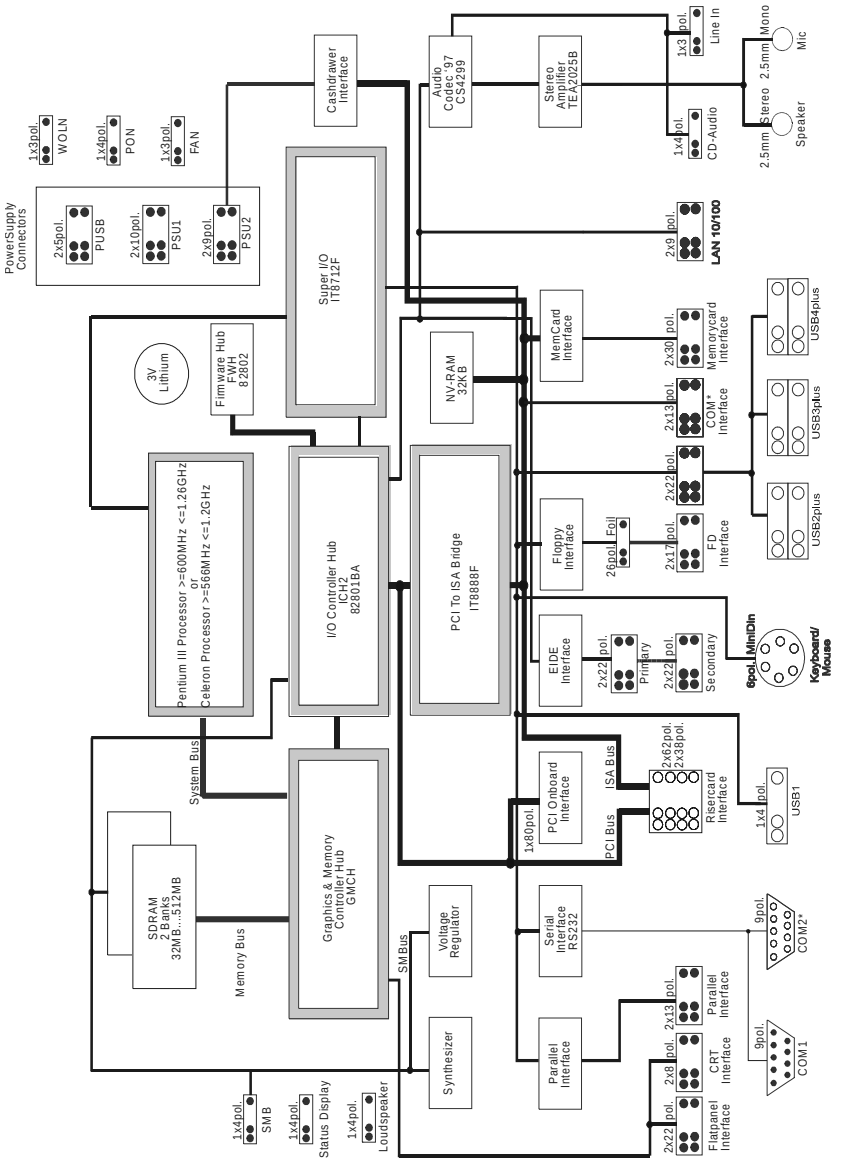
Mainboard w/o additional serial interfaces



Mainboard with COM3*, COM4* interface



Mainboard with USBplus interface



Technical Data

Supported Systems	BEETLE/M, BEETLE/XL-II, BEETLE/NetPOS, BEETLE/S
Architecture	PC-AT compatible and POS – specific functional units
Technology	TTL,CMOS,LVT; SMD + 5V, +3.3V, AGTL+ technology
Operating Modes	Normal Mode, Power Save Mode
Power Management	APM 1.2
Operating Systems	DOS, WIN 98SE, WIN Me, WIN NT 4.0, WIN2000, WIN CE, LINUX
Microprocessor	**INTEL Celeron™ (566 MHz-1.2 GHz)** 32 KB L1 Cache, 128/256 KB L2 Cache 370 Pin FC-PGA package **INTEL Pentium™ III (600 MHz-1.26 GHz);** 32 KB L1 Cache, 256/512 KB L2 Cache, 370 Pin FC-PGA package
Chipset	INTEL chipset 815E: Graphic and Memory Controller Hub (GMCH) with the following functions: Memory Cntrl. Supports SDRAM with 100MHz/133MHz System memory bus, Video memory part of main memory (max. 10 MB under Windows) including 4MB pixel memory, Graphic Cntrl. Supports 2D and 3D graphics I/O Controller Hub 82801BA (ICH2) with the following functions: LAN 10/100 Cntrl., IDE-Cntrl. w/ UDMA, USB Cntrl., AC97 Link for Audio and telephony CODEC, Interrupt-Cntrl., DMA-Cntrl., LPC-Interface, RTC, SMBus-Host interface Firmware Hub 82802 (FWH): >= 4 MBit Flash Memory

Max. Resolution CRT	up to 1600x1200 pixel@ 8 bit color up to 1280x1024 pixel@ 24bit color up to 1024x768 pixel@ 24 bit color
Max. Resolution TFT	Up to 1280x1024 pixel@ 24bit color
ISA Bus	IT8888F , PCI to ISA Bridge
Super I/O	IT8712F with the following functions: 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	2 DIMM - sockets (168 pin), 3.3 V SDRAM technology, unbuffered, PC100/PC133 - Standard DIMM Height up to 35 mm 32MB to 512MB, Combinations of different modules are possible
PCI Interface	PCI-Bus (32 bit interface, 33MHz)
Riser-Card Interface	ISA-Bus, PCI-Bus (32 bit interface, 33MHz)
BIOS	>=4 MBit Flash Memory, Phoenix BIOS, PnP ISA/PCI Rev.1.0A DMI -support
NVRAM	32KB data retention 5 years
Battery	3 V Lithium for RTC and NVRAM Type: CR1/3 N , 160 mAh
SDRAM Bus Frequency	100 MHz, 133MHz
PCI Bus Frequency	33 MHz

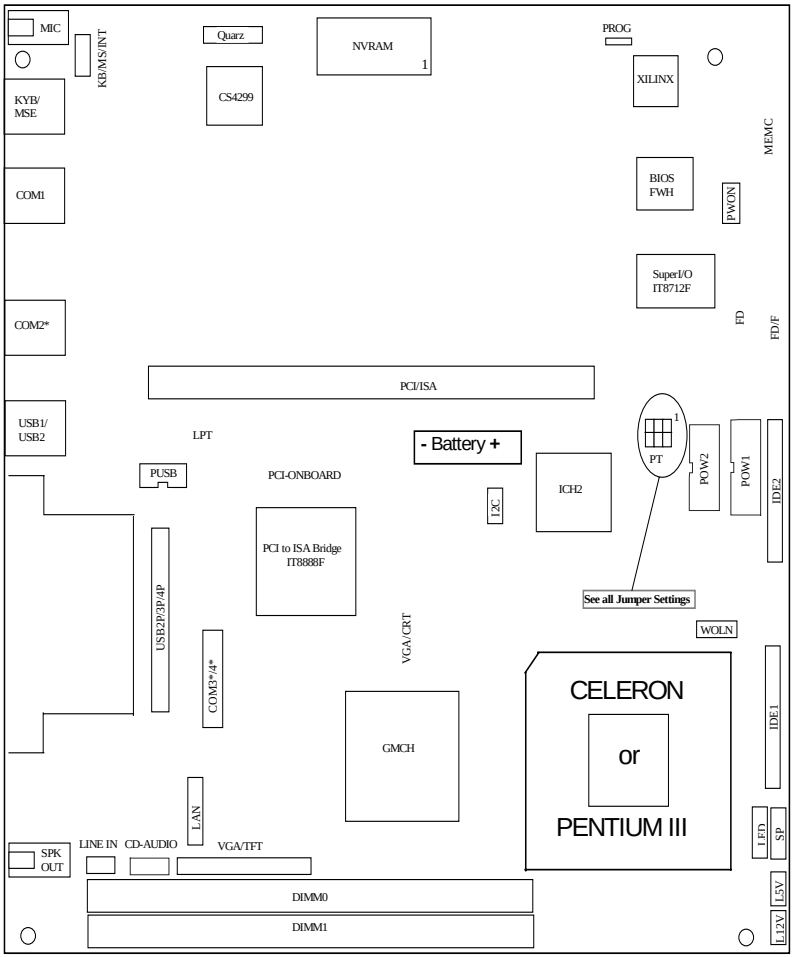
AT Bus Frequency	8.25 MHz
Wake On feature	Wake On LAN (w/ connector for Standard- LAN- adapter), Wake On MODEM support
Keyboard connection	PC-AT compatible
PS/2-Mouse connection	via Y-cable together with keyboard
Serial interfaces	COM1, COM2* COM3*, COM4* - adapter optional and alternative to (USB2plus, USB3plus, USB4plus)-adapter
Parallel interface	IEEE1284 compatible (ECP, EPP, bidirectional)
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 USB1, 2: Standard 2 port connector, series A with +5V standby voltage; (USB2plus, USB3plus, USB4plus)-adapter with +5V system voltage optional and alternative to COM3*, COM4*- adapter (if USB plus -adapter is used, USB2 onboard is not available)
Cash drawer connection	up to 2 cash drawers can be connected, connection via RJ12 connector inside Power supply

PCI Plug-in card interface	32 bit interface, 33 MHz
Memory card connection	JEIDA standard V4.0/PCMCIA 1.0, Max. 64MB, flash card writable
Status display connection	support for LEDs: Power On and HD activity
Current Consumption Pentium III/866MHz 256MB Ram	4.6 A @ +5V 2.5 A @ +3.3V 0,5 A @ +5V Standby 60 mA @ +12V 50 mA @ -12V
Current Consumption Pentium III/1.26 GHz, 256MB Ram	4.8 A @ +5V 2.6 A @ +3.3V 0,5 A @ +5V Standby 60 mA @ +12V 50 mA @ -12V
Current Consumption Celeron/566 MHz, 256MB Ram	3.4 A @ +5V 2.4 A @ +3.3V 0,5 A @ +5V Standby 60 mA @ +12V 50 mA @ -12V
Current Consumption Celeron/1.2 GHz, 256MB Ram	4.6 A @ +5V 2.6 A @ +3.3V 0,5 A @ +5V Standby 60 mA @ +12V 50 mA @ -12V
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
Full functionality of USBplus is available only if the Power supply unit (212W) AP10P023-280 (or equivalent) will be used in the system.	
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: 2,0 A
The values of max. current refer to the voltage drops on the CPU. The max. current of the different BEETLE systems are dependent on the used PSUs.	
Fuses (Polyswitches) +5V	COM2*, COM3*, COM4*, USB1, Keyboard, Mouse USB2plus, USB3plus, USB4plus (Fuse on adapter)
+12V	COM2* COM3*, COM4* (Fuse on adapter) USB2plus, USB3plus (Fuse on adapter) USB4plus (12V version, Fuse on adapter)
+24V:	USB4plus (Fuse on adapter)
Board Dimensions	255 mm x 209 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.



Onboard Components

Processor

The D2- CPU supports Pentium III processors as well as Celeron processors in 370 Pin FC-PGA/FC-PGA2 package. The released types are:

Processor type	Processor speed	Host Bus frequency	Cache size	Memory Bus frequency
Celeron	566 MHz	66MHz	128 KB	100 MHz
Celeron	1.2 GHz	100 MHz	256 KB	100 MHz
Pentium III	600 MHz	100 MHz	256 KB	100 MHz
Pentium III	700 MHz	100 MHz	256 KB	100 MHz
Pentium III	866 MHz	133 MHz	256 KB	133 MHz
Pentium III	1.26 GHz	133 MHz	512 KB	133 MHz

The frequency selection is automatically selected. Also the core voltage – which depends on processor type and revision version – are defined automatically by the processors VID pins.

Attention:

- The passive heatsink has to be correctly installed.
- The heatsink paste is absolutely necessary.
- The processor fan – if installed – has to be controlled whether it works properly.

System Memory

The D2 – CPU provides two DIMM sockets for connecting memory modules in SDRAM technology up to 512 MByte (2 x 256 MB). DIMMs with different sizes can be used. PC100 as well as PC133 (PC133:modules with 64MB, 128MB, 256MB capacity) modules may be used. The RAM timing depends on DIMM types and type of processor.

	Main Memory	
Socket 1	**Socket 2**	**Total capacity**
8MBx64	(8MBx64)	64 MB(128 MB)
16MBx64	(16MBx64)	128 MB(256 MB)
32MBx64	(32MBx64)	256 MB(512 MB)

➔ Any combinations of these DIMMs are allowed.

The following table shows possible combinations of processors, PC100 modules and PC133 modules.

	Celeron 566 MHz	**Celeron 1.2 GHz**	**Pentium III 600 MHz**	**Pentium III 866 MHz**	**Pentium III 1.26 GHz**
PC100 Modules	FSB 66MHz SDRAM 100MHz	FSB 100MHz SDRAM 100MHz	FSB 100MHz SDRAM 100MHz	FSB 133MHz SDRAM 100MHz	FSB 133MHz SDRAM 100MHz
PC133 Modules	FSB 66MHz SDRAM 100MHz	FSB 100MHz SDRAM 100MHz	FSB 100MHz SDRAM 100MHz	FSB 133MHz SDRAM 133MHz	FSB 133MHz SDRAM 133MHz

- FSB: Front Side Bus (Processor Frequency)
- SDRAM: RAM frequency

Graphic System

The main part of the graphic system is the Graphic Memory Controller Hub (GMCH) – part of the chipset. It contains the complete graphic system as well as the memory controller.

The Video memory is part of the main memory (max. 10 MB under Windows) including 4MB pixel memory. The Graphic Controller supports 2D and 3D graphics.

The maximum resolution depends on the connected monitor type:

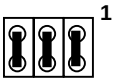
Max. Resolution CRT:	1600 x 1200 pixel / 8 colors bit
	1280 x 1024 pixel / 24 color bit
	1024 x 768 pixel / 24 color bit
Max. Resolution TFT:	1280 x 1024 pixel / 24 color bit

Because the different Flatpanels from Wincor Nixdorf International are optimized for a special resolution, every Flatpanel has its own jumper setting. The following jumpersetting is defined; unused combinations are reserved for the future.

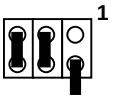
Jumper Settings

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)

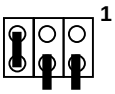
12” Monitor BA72A PT:



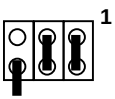
15” Monitor BA73A PT:



12” Monitor BA72A-1 PT:



10” Monitor 640 x 480 PT:



Audio System

The audio systems contains on the AC‘97 compatible Sound controller – part of the chipset - , the CODEC (CS4299 from Chrystal) and the audio amplifier .

The stereo output is 1.25W at 8 Ohm each channel.

NVRAM

The NVRAM may be used under DOS for saving non volatile data.
The NVRAM is housed in DIL package; the size is 32KB or 128KB.

IDE Interface

For connecting IDE drives there are 2 connectors on the CPU available. The connectors are 2mm header, 44 pin with +5V power supply.
2.5” hard disc drives and CDROM/DVD drives are connected without additional power lines.
3.5” drives are connected via an adapter cable, which differs between the various BEETLE models.
The interface may be driven in PIO mode 0 – mode 4 or in UDMA mode 0 – 2.

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 ½” drives.
Standard 1.44MB and 720KB Floppy Discs are supported.

Memory Card Interface

The memory card interface is standard in BEETLE systems and supports the released BEETLE cards. It may be used under DOS system.

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-Bridge

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

COM3*,4* Module

The COM3*,COM4* module may be used, to implement 4 serial interfaces. If this Module is assembled, the USB2 port is available at the standard USB connector.
The voltages +5V and +12V are protected by polyfuses.

USBplus Adapter (2 versions)

The USBplus adapter 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 12V version may be used with introduced PSUs, the current is limited. The 24V version may be used only with the new 212W Power Supply Unit (PSU) API0PO23-280 or equivalent.
If one of the USBplus modules is assembled , the USB2 port is automatically disabled. The voltages +12V and +24V are protected via polyswitches.

PanelLink Bridge

The PanelLink bridge serves as interface for connecting BA72A, BA72A-1 or BA73A to the D2- CPU.

The Bridge may not be used on the D1- CPU. The TFT adapter (C2-CPU) and PanelLink bridge (D1-CPU) must not be used on the D2- CPU.

LAN 10/100 Adapter

While the LAN controller is part of the INTEL chipset the LAN adapter contains the physical layer including Ethernet address. The LAN adapter was developed for the D2- CPU.

PCI Onboard LAN

A PCI Onboard LAN controller (3Com; Realtek) may be used alternatively to the LAN adapter.

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").

Fixed I/O Address Ranges

The following table contains all of the I/O address lines of the CPU. The access type and the bit width are specified alongside the port address and the function performed by the command.

PORT ADDRESS	FUNCTION
0000h-001Fh	DMA controller
0020h-002Dh	Interrupt controller
002Eh-002Fh	LPC SIO
0030h-003Dh	Interrupt controller
0040h-0043h	Timer/Counter
004Eh-004Fh	LPC SIO
0050h-0053h	Timer/Counter
0060h-0066h, even	LPC
0061h-0067h, odd	NMI
0070h-0076h, even	NMI/RTC
0071h-0077h	RTC
0080h-0091h	DMA controller
0092h	Reset
0093h-009Fh	DMA controller
00A0h-00B1h	Interrupt controller
00B2h-00B3h	Power Management
00B4h-00BDh	Interrupt controller
00C0h-00DFh	DMA controller
00F0h	FERR#/IGNNE#/Interrupt controller
0170h-0177h	Hard disk, primary
01F0h-01F7h	Hard disk, secondary
0270h-0277h	Serial interface COM4 (w/ POS board)
0290h-029Fh	Hardware Monitor
2E0h-2E8h	Serial interface COM5
02F8h-02FFh	Serial interface COM2*
0300h-030Fh	Reserved for testing

Fixed I/O Address Ranges (ctd.)

PORT ADDRESS	FUNCTION
0310h-031Fh	POS logic
0376h	Hard disk, primary
03C0h-03CFh	Graphicsystem
03D4h-03D5h	Graphicsystem
03DAh	Graphicsystem
03E8h-03EFh	Serial interface COM3 (w/ POS board)
03F0h-03F7h	FDC primary
03F6h	Hard disk, secondary
03F8h-03FFh	Serial interface COM1*
04D0h-04D1h	Interrupt controller
0CF9h	Reset
F80h-FFFh	GPIO addressing
1000h-1FFFh	815E chipset addressing

Interrupt Assignments

The interrupt assignments correspond to the standard AT assignments plus POS- specific characteristics.

Interrupt no.	Cause of interrupt
IRQ0	Timer output 0
IRQ1	Keyboard
IRQ2	Cascade
IRQ3	COM2*
IRQ4	COM1*
IRQ5	LAN/available
IRQ6	Floppy disk
IRQ7	LPT/available
IRQ8	Realtime clock
IRQ9	Power failure/available
IRQ10	available
IRQ11	available
IRQ12	PS/2Mouse/available
IRQ13	(Coprocessor)
IRQ14	HD(Primary
IRQ15	HD(Secondary)/available

Available means the availability of PCI and/or PnP components.

➔ **One Interrupt of IRQ9, IRQ10 and IRQ11 will be used by the BIOS system manager.**

DMA Channel Assignments

The DMA channel assignments correspond to the assignments in the AT standard.

DMA channel	Assignment
DMA0	spare
DMA1	spare
DMA2	Floppy disk
DMA3	spare
DMA4	Cascade for Ctlr 1
DMA5	spare
DMA6	spare
DMA7	spare

DMA1 or DMA3 will be used by LPT in EPP mode.

PCI – Interface

Devices and Functions

The ICH2 incorporates a variety of PCI functions as shown in the table below. These functions are divided into three logical devices: (Bus0, Device30 ; Bus0, Device31 and Bus1, Device8). An additional device is the PCI to ISA Bridge (Bus1, Device6)

BUS: DEVICE:FUNCTION	**FUNCTION DESCRIPTION**
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 2	USB Controller #1
Bus 0: Device 31: Function 3	SMBus Controller
Bus 0: Device 31: Function 4	USB Controller #2
Bus 0: Device 31: Function 5	AC´97 Audio Controller
Bus 0: Device 31: Function 6	AC´97 Modem Controller
Bus 1: Device 6: Function 0	PCI to ISA Bridge
Bus 1: Device 8: Function 0	LAN Controller

Additional Onboard Components

The Onboard PCI connector may be used to assemble alternatively one Plug In Modul with up to two PCI-Slot functionalities (double sided).

The 3COM LAN modul and Onboard VGA/4- Submodul are introduced.

Bus 1: Device 10: Function 0	Onboard LAN- Submodul
Bus 1: Device 12: Function 0	VGA/4- Submodul

New Risercard Definition

➔ Risercards with up to three PCI –Slots are supported.

The device address of the integrated LAN controller in the ICH2 makes a reorganisation of the BEETLE Risercards necessary.

1 x PCI (shared /w ISA)	Device 9
2 x PCI	Device 9 , 11
3 x PCI	Device 9 , 11 , 13

➔ The ISA/PCI shared slot gets the Device address 9. The subsequent addresses are 11 and 13.

New risercards are backwards compatible and may be used in all introduced systems.

Restrictions

- The implementation of PCI is based on the specifications 2.0.
- Only 5 Voltage PCI cards are supported.
- 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 D2- CPU provides power management functions dependent on the installed Operating System. Full functionality of USBplus is only guaranteed when the enhanced power supply units (212W) are available.

Normal Mode/Standby Mode

Switching on

The power supply will be activated and deactivated via the main switch at the rearside of the system. Activating the main switch 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 temporary switch 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. A third possibility to switch on the system is connecting a modem which activates the “Ring indicator” signal. 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 temporary switch longer than 4 seconds will switch off the system.

Power Failure

If the main power fails (AC input) for longer than 20 msec and the UPS feature is not used, 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. If in the BIOS Setup “Follow AC” is chosen, the system follows the main power.

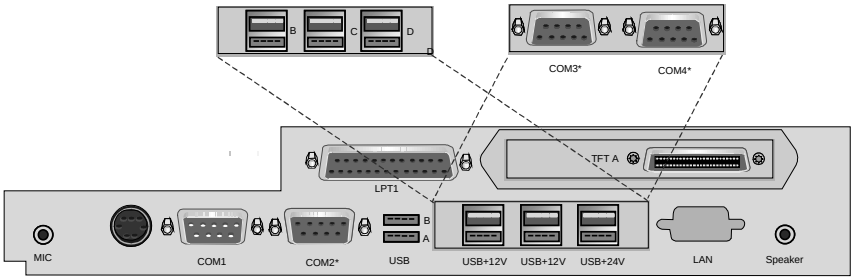
Power save Mode

The Power Save Mode supports the following items:

- Processor enters the “Toggle Mode”
- Hard Discs are switched off after defined time
- Monitor is switched off after defined time

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.

COM-Interfaces

Connect supplementary standard peripherals via the COM1 serial interface. Make sure that all supplementary devices have been tested for RFI suppression pursuant to the legal requirements of your country!

COM 1 - COM 4*

Depending on the systems configuration, scanners without an independent power supply are connected to the COM2*, COM3* or COM4* serial interface (standard setting COM3*). Connect scales with their own power supply to the COM1 interface. COM1 is designed as a 9-pin D-sub plug, whereas COM2* - COM4* are 9-pin D-sub jacks.

Make sure that the scanner connector is plugged securely into the socket to prevent possible malfunctioning.
If scales are connected to the BEETLE system which are not supplied by Wincor Nixdorf International, you must obtain a licence for the driver software.
The COM1 or COM2* interface is without effect if a TFT adapter with touch screen function is installed.

COM2* or COM4*

Depending on how the system is configured, the customer display is connected to either the COM2* or COM4* serial interface. The interface connection is a 9-pin D-sub jack. Make sure that the connector for the customer display is screwed firmly to the socket to prevent possible malfunctioning. Power is supplied via this jack.

COM3*

Connect the cashier display to the serial interface COM3*. This port is a 9-pin D-sub jack. Make sure that the connector for the cashier display is screwed firmly to the socket to prevent possible malfunctioning. Power is supplied via this jack.

PIN-Assignment COM-Interfaces

COM1 is a standard RS232 interface with a 9 pin D-SUB connector, type male.

PIN #	COM1
1	DCD1F
2	RXD1 F
3	TXD1 F
4	DTR1 F
5	GND F
6	DSR1 F
7	RTS1 F
8	CTS1 F
9	RI1 F

COM2* is a a 9 pin D-SUB connector, type female for a BEETLE standard RS232 interface with +5V and +12V power supply.

PIN #	COM2*
1	P12VFS
2	RXD2 F
3	TXD2 F
4	DTR2 F
5	GND F
6	DSR2 F
7	RTS2 F
8	CTS2 F
9	P5VFS

COM3*,4* are 9 pin D-SUB connectors, type female for a BEETLE standard RS232 interfaces with +5V and +12V power supply.

PIN #	COM3*	COM4*
1	P12VFS	P12VFS
2	RXD3 F	RXD4 F
3	TXD3 F	TXD4 F
4	DTR3 F	DTR4 F
5	GND F	GND F
6	DSR3 F	DSR4 F
7	RTS3 F	RTS4 F
8	CTS3 F	CTS4 F
9	P5VFS	P5VFS

➔ These connectors are part of the COM adapter and , if populated, available at the rearside of the cabinet.

CRT

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

TFT Panel Link

With a TFT Panel Link 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 PanelLink interface connector is a 40pin 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	Beeper OUT
27	NC	28	NC
29	NC	30	NC
31	NC	32	NC
33	NC	34	NC
35	NC	36	NC
37	NC	38	NC
39	NC	40	NC

VGA/4 LCD

The VGA/4 LCD controller is provided with two 26 pin MiniDelta Ribbon connectors.

LCD Display 1 operator / Upper Data		**LCD Display 2 customer / Lower Data**	
Pin #	Signal :	Pin #	Signal :
1	+12 V	1	+12 V
2	+12 V	2	+12 V
3	**LD 3**	3	**UD 3**
4	**GND** (v. LD 3)	4	**GND** (v. UD 3)
5	**LD 2**	5	**UD 2**
6	**GND** (v. LD 2)	6	**GND** (v. UD 2)
7	**LD 1**	7	**UD 1**
8	**GND** (v. LD 1)	8	**GND** (v. UD 1)
9	**LD 0**	9	**UD 0**
10	**GND** (v. LD 0)	10	**GND** (v. UD 0)
11	**UD 3**	11	**LD 3**
12	**GND** (v. UD 3)	12	**GND** (v. LD 3)
13	**UD 2**	13	**LD 2**
14	**GND** (v. UD 2)	14	**GND** (v. LD 2)
15	**UD 1**	15	**LD 1**
16	**GND** (v. UD 1)	16	**GND** (v. LD 1)
17	**UD 0**	17	**LD 0**
18	**GND** (v. UD 0)	18	**GND** (v. LD 0)
19	**LP**	19	**LP**
20	**GND** (v. LP)	20	**GND** (v. LP)
21	**SCL**	21	**SCL**
22	**GND** (v. SCL)	22	**GND** (v. SCL)
23	**M**	23	**M**
24	**GND** (v. M)	24	**GND** (v. M)
25	**FLM**	25	**FLM**
26	**D Off**	26	**D Off**
Shell		Shell	

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	GND
2	MIC F
3	NC
4	HIGH
5	GND

Line Out

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

PIN #	SIGNALS OUT
1	AGND
2	LOR
3	NC
4	LOL
5	NC

Line In

The Line In connector is a 3 pin header.

PIN #	SIGNALS CD
1	LIL
2	LIR
3	AGND

CD-Audio

The CD-Audio connector is a 4 pin header.

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

Speaker Out

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

PIN #	SIGNALS Out
1	AGND
2	LOLAF
3	NC
4	LORAF
5	NC

USB1/USB2

The USB interface contains 2 downstream ports providing the data rates of 12 MHz for high speed USB peripherals and 1.5 MHz for low speed USB peripherals. Instead of the serial interfaces COM3* and COM4* the system can be equipped with 3 powered USB interfaces (12V/0.5A; 12V/1.5A; 24V/2A). Connect only cables to the 24V connector which are marked with DP-1 or DP-2. Only devices equipped with a shielded cable must be connected to the USB interface.

USB1, USB2 are standard USB ports, connector series A

PIN #	USB1	USB2
1	P5V1F	P5V2F
2	U1D-	U2D-
3	U1D+	U2D+
4	+GND	GND

USB2plus,USB3plus,USB4plus

The USB ports with additional 12V and 24V power lines.

- USB2plus, USB3plus type BERG 74239-100
- USB4plus type BERG 74239-100 (12V version)
- USB4plus type BERG 74239-200 (24V version)

PIN #	USB2plus	USB3plus	USB4plus
1	P5V2F	P5V2F	P5V3F
2	USB2M	USB3M	USB4M
3	USB2P	USB3P	USB4P
4	GND_U2F	GND_U3F	GND_U4F
5	GND_U2F	GND_U3F	GND_U4F
6	P12VFUS2	P12VFUS3	P12VFUS4 (P24VFUS4)
7	P12VFUS2	P12VFUS3	P12VFUS4 (P24VFUS4)
8	GND_U2F	GND_U3F	GND_U4F

KYBD

Your BEETLE system has a 6-pin mini-DIN jack for connecting a keyboard. Make sure that the connector is plugged firmly into the socket to prevent mal-functioning. Power is supplied to the keyboard via this socket. If you wish to connect a standard PC keyboard with DIN connector, you must use a special adapter cable, obtainable from the Wincor Nixdorf International branch office responsible for your area.

Introduced BEETLE keyboards with PS/2 interface may be connected.

PIN #	KYB/E
1	KDF
2	MSDAF
3	GNDFKYHL
4	P5VFKYHL
5	KCF
6	MSCKF

PS/2 Mouse

You may connect a PS/2 Mouse via an y-cable to the keyboard connector. The cable is obtainable from the Wincor Nixdorf International branch office reponsible for your area.

LPT1

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 D2	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		

BIOS Setup

The Celeron / Pentium III 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.

The Celeron / Pentium III mainboard will be delivered with two different BIOS versions:

the **Standard BIOS** version displayed as **WN STD xx/yy** on the screen and the **POS BIOS** version displayed as **WN POS xx/yy** on the screen.

Due to the considerable and visible differences both BIOS versions are explained separately in this document.

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 POS specific components described in this document (e.g. NVRAM, Memory Card, some POS Displays) are *not* supported by the »Standard BIOS» version they will only supported in the «POS BIOS» version.

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:

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 alternates 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>.

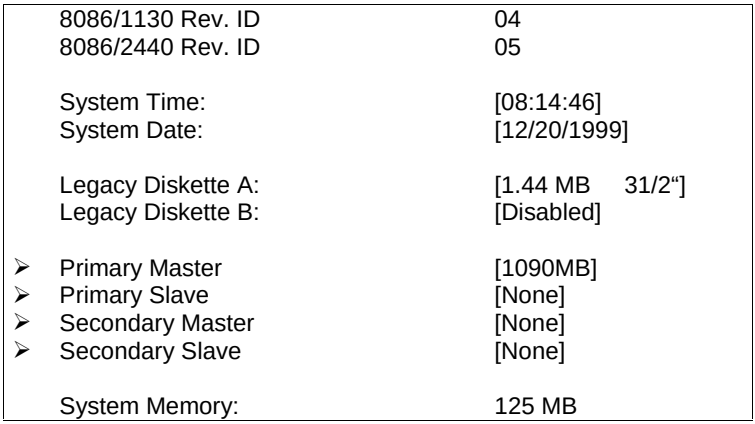
Sub-Menu

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.

Main screen

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



8086/1130 Rev. ID, 8086/2440 Rev ID

This field displays the revision of the i815E chipset. This is a display only field.

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"], Legacy Diskette B [Disabled]

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

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

Type:		[Auto]
	CHS Format	
Cylinders:		[2112]
Heads:		[16]
Sectors:		[63]
Maximum Capacity		1090MB
	LBA Format	
Total Sectors		2128896
Maximum Capacity		1090MB
Multi-Sector Transfers:		[8 Sectors]
LBA Mode Control:		[Enabled]
32 Bit I/O:		[Disabled]
Transfer Mode:		[Fast PIO 4]
Ultra DMA Mode		[Disabled]
SMART Monitoring		

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 auto-detected 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].

PIO Mode

This option lets you seta PIO (Programmed Input/Output) mode for the IDE device. Modes 0 trough 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.

Installed 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	[Middle]
Local Bus IDE adapter	[Both]
SMART Device Monitoring	[Disabled]
PS/2 Mouse:	[Disabled]
Large Disk Access Mode:	[DOS]
Legacy USB Support	[Enabled]
ISA graphics device	[No]
Boot-Video device	[Onboard]
Onboard LAN BootProm	[Enabled]
QuickBoot Mode	[Disabled]

- I/O Device Configuration
- PCI/PNP ISA UMB Region Exclusion
- PCI/PNP ISA IRQ Resource Exclusion
- DEMI 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 [Middle]

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

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].

PS/2 Mouse [Disabled]

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 Netware, 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 [Enabled]

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 98 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]

ISA graphics device installed [No]

Some nonstandard VGA cards may not show colors properly. The settings [Yes] should correct this problem. Otherwise, leave this on the default setting of [No].
Configuration options: [No] [Yes].

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].

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]

I/O Device Configuration

Serial port A:	[Enabled]
Base I/O address/IRQ	[3F8/IRQ 4]
Serial port B:	[Enabled]
Base I/O address/IRQ	[2F8/IRQ3]
Parallel port:	[Enabled]
Mode:	[Bi-directional]
Base I/O address:	[378]
Floppy disk controller:	[Enabled]
TouchScreen Routing:	[No Routing]
IRQ-Routing COM3 COM4:	[COM3_I10 COM4_I10]

Serial port A [Enabled], Serial port B [Enabled]

These fields configure the Serial ports directly. With [Disabled] the port is switched off. Configuration options: [Disable] [Enable]

Base I/O address

This field sets the address with fixed IRQ for the onboard serial connectors in combination with the interrupt used. Serial port A and Serial port B must have different addresses. Configuration options: [3F8/IRQ 4] [2F8/IRQ 3] [3E8/IRQ 4] [2E8/IRQ 3].

Parallel port [Enabled]

This filed has the same configuration options as the two serial ports.
Configuration options: [Disabled] [Enabled].

Mode [Bi-directional]

This field allows you to set the operation mode of the parallel port.
Configuration options: [Bi-directional] [EPP] [ECP]

Base I/O address

This field sets the address for the onboard parallel connector.
Configuration options: [378] [278] [3BC].

Floppy disk controller [Enabled]

This field allows you to activate or deactivate the floppy interface.
Configuration options: [Enabled] [Disabled].

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] [Route to COM1] [Route to COM2] .

IRQ-Routing COM3 COM4 [COM3_I10 COM4_I10]

This Field is available only when the Onboard-COM3-COM4_Card is mounted. The Serial Interfaces COM3 and COM4 are to be routed to IRQ10/IRQ11 via software configuration. You have options to route COM3 to IRQ10 or left unrouted (i.e. COM4 to IRQ11 or left unrouted). Or you can share IRQ10 with COM3 and COM4.
Configuration Options: [COM3____ COM4____] [COM3____ COM4_I11] [COM3_I10 COM4_I10] [COM3_I10 COM4____] [COM3_I10 COM4_I11].

➔ Refer to “PCI/PNP ISA IRQ Resource Exclusion” for appropriate IRQ-Reserving

PCI Configuration

PCI/PNP ISA UMB Region Exclusion

These fields allow you to set some memory areas as [Reserved] for a legacy ISA card that uses a memory segment within the CC00 and DFFF address range. If you have such a card and you are not using an ICU to specify its address range, select one or more memory address from the five available options.
Configuration options: [Available] [Reserved].

CC00 – CFFF:	[Available]
D000 – D3FF:	[Available]
D400 – D7FF:	[Available]
D800 – DBFF:	[Available]
DC00 – DFFF:	[Available]

PCI/PNP ISA IRQ Region Exclusion

These fields indicate whether or not the displayed IRQ for each field is being used by a legacy (non-PnP) ISA card. The default value indicates either that the displayed IRQ is not used or that ISA Configuration Utility (ICU) is being used to determine whether an ISA card is using that IRQ. If you install a legacy ISA card

that requires an unique IRQ and you are not using an ICU, you must set the field for that IRQ to [Reserved]. Configuration options: [Available] [Reserved].

➔ As the BEETLE System requires one IRQ from IRQ9...11 for internal purposes, you must NOT reserve all three IRQ9 AND IRQ10 AND IRQ11. At least one of these three IRQs must be set to [Available]. If you are facing problems configuring the system after selecting [Reserved] / [Available], use the ´Reset Configuration Data´ function in the Advanced Menu to clean up the system.

IRQ 3	[Available]
IRQ 4	[Available]
IRQ 5	[Available]
IRQ 7	[Available]
IRQ 9	[Reserved (see ATTENTION)]
IRQ 10	[Reserved (see ATTENTION)]
IRQ 11	[Available]
IRQ 12	[Available]

DMI Event Logging

Event log capacity	Space available
Event log validy	Valid
View DMI event log	[Enter]
Clear all DMI event logs	[Nol]
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]
Processor Serial Number	[Disabled]

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].

Processor Serial Number

This setup point is only displayed if a Pentium CPU is installed in the mainboard. Some software packages would like to read the serial number of such a processor for protecting their software.

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]
Power Savings:	[Disabled]
Standby Timeout:	[Disabled]
Resume On Time:	[Disabled]
Resume Time:	[Disabled]
Resume On Modem Ring:	[Disabled]
Wake Up On LAN:	[Disabled]
➢ 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 [Power Up] selected, the system will startup after switching the main power from on to off. Configuration options: [Stay off] [Restore] [Power Up].

Power Savings [Disabled]

This field acts as the master control for the power management modes. [Disabled] disables the power saving features. [Enabled] allows you to set power Standby Timeout from Disabled to 8 minutes. Configuration options: [Disabled] [Enabled]

Resume On Time [Disabled]

This allows an unattended or automatic system power up. You may configure your system to power up at a certain time. The Wakeup Time is to setup in the next field below this field. Configuration options: [Disabled] [Enabled]

Wake Up 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.

➔ 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 Up On LAN [Disabled]

Wake-On-LAN allows your BEETLE to be booted from a system via a network by sending a wake-up frame or signal. Configuration options: [Disabled] [Enabled].

Hardware Monitor

CPU Temperature:			44 ˚C
CPU Fan Speed			4448 rpm
Power Supply Fan Speed			2766 rpm
+VCC	DUA	Voltage	5.29 V
-12V		Voltage	13.66 V
+12V		Voltage	12.67 V
+VCC		Voltage	5.29 V
+3.3V		Voltage	3.20 V
+3.3V	DUA	Voltage	3.45 V
+1.8V		Voltage	1.90 V
+VCC ID		Voltage	1.85 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).

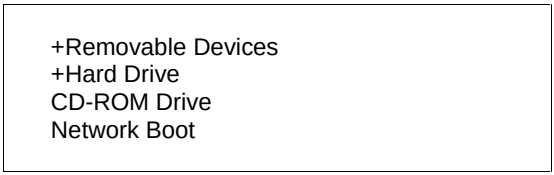
CPU Fan Speed, Power Supply Fan Speed (xxxxrpm)

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.xxV]

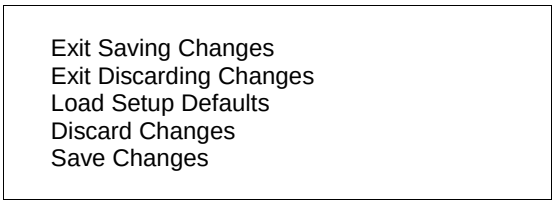
The onboard hardware monitor is able to detect the voltage output by the on-board voltage regulators.

Boot Menu



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.

Exit Menu



Once you have made all of 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.

➔ Pressing <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.

The POS BIOS

This setup is an integral part of the BIOS. It has been incorporated in the BIOS FLASH ROM. At present, the setup can be started in the following ways:

- By pressing the key <2> during the POST test phase.
- By simultaneously pressing <Ctrl>+<Alt>+<ESC> after the final beep.
- By setting the key lock on the POS keyboard to „T“ or „4“.
- By pressing the key <2>, if the configuration is incorrect (this is revealed by the BIOS test).

Since the output can also appear on a 4-line VFD screen as well as on a VGA screen, the setup messages are adapted to the format of the VFD display with 4 lines x 20 characters.

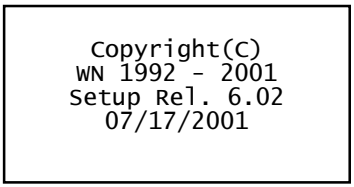
The different graphic cards have a fixed priority. A legacy VGA graphic card has the highest priority, this means, all outputs are sent to *this* screen adapter regardless of the presentation of an other display card. The priority stepping as follows:

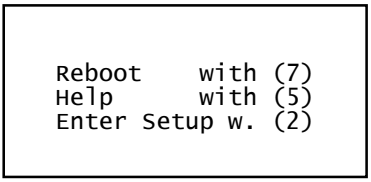
Highest priority:	Legacy ISA VGA card
	PCI VGA card
	Onboard graphic
Lowest priority:	External VFD display

➔ Outputs are sent to the VFD screen if no other VGA board is found.

For the installing of IDE hard disks an auto configuration mode is installed in the setup. The parameters can be read from the disk and are stored in the CMOS-RAM. If the hard disk is an enhanced type with higher transfer mode, the BIOS will detect this feature and enable it automatically.
The various setup screens are described in details below:
The outputs are distributed over several screen pages. Where possible, related functions are shown on the same page.

The setup program begins with a copyright message. This is followed automatically by a help screen.



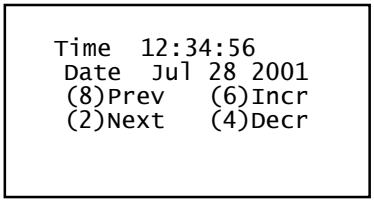


When you press the key <2> here, you will proceed to the setup dialog.

Time and Date

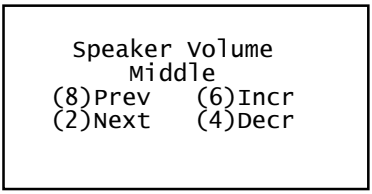
The date and time appear first of all. The time display will be updated every second, while the line with the date is still the same on the display, even if the time will change from 23:59:59 to 00:00:00. Inside of the internal real time clock the date will change normally. The next time you move the cursor, the display is completely refreshed and the date is updated.

These two lines are followed by further two lines containing help information. The two messages on the left tell you how to advance from one setup screen to the next, while those on the right indicate which keys can be used to alter the values.



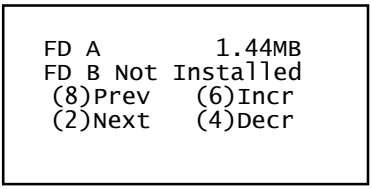
Speaker Volume

This screen offers the possibility to change the volume of the installed PC speaker. There are three choices implemented: *Low, Middle, High.*



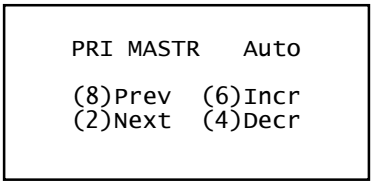
Drive A / Drive B

These fields record the types of floppy disk drives installed in the system. The memory card drive can also be specified here as an alternative drive. The available options for drives A and B are: *720KB, 1.44MB, MEM-Card, Not Installed*.

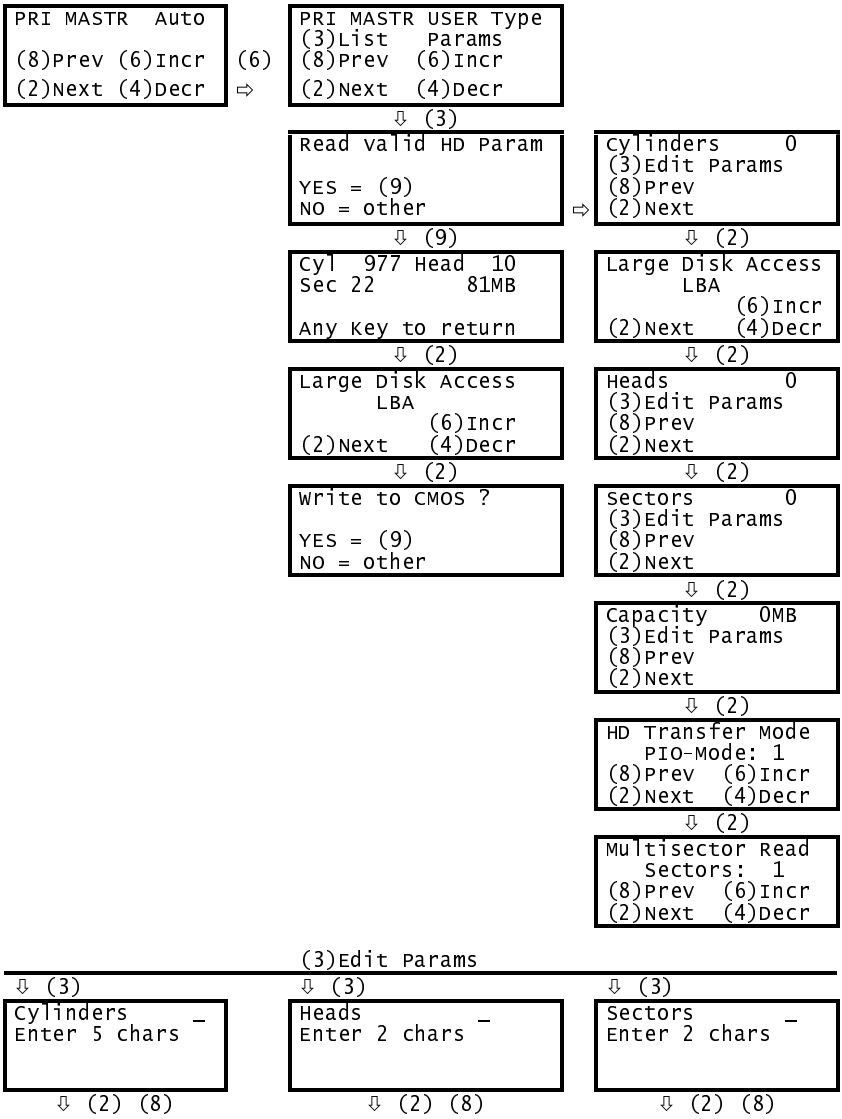


Hard disks

This field records the specifications for the hard disk installed in the system. The onboard 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 of them is the “master” and the second is the “slave”. The available options for all drives are: *Auto*, *User*, and *None*. Use the *Auto* setting for detection and configuration of the IDE device during boot up.



The next screen display shows the hard disks configurations:

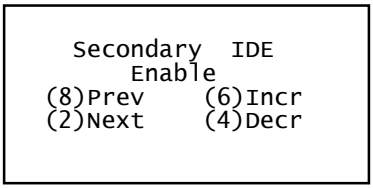


As shown in the diagram above, there are two basic possibilities:

- Entering a configuration manually with the aid of the parameters specified in the documentation for the IDE hard disks, and
- Automatic configuration of the IDE hard disk with reading the parameters directly from the disk through the setup program.

Secondary IDE

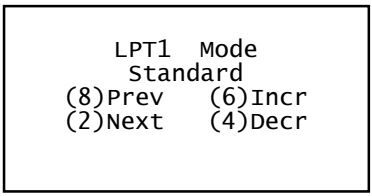
This option lets you enable or disable the secondary IDE port. If the port is enabled, you will see the same setup screens for the secondary port like the one for the primary.



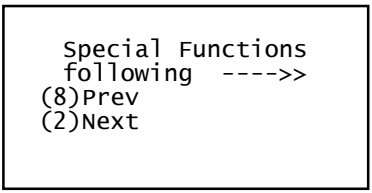
Parallel Port Mode

This field allows you to set the onboard parallel port connector. You can select either: *Standard, EPP, ECP*. If you install an I/O card with a parallel port, ensure that there is no conflict in the address assignments. Alternatively the onboard port will be disabled after confirming an error message with the key <7> before booting the operating system. The hardware parameters for the parallel port are Addr. 378h, IRQ 7 and DMA 1.
The onboard serial ports 1 (Addr. 3F8h/IRQ4) or port 2 (Addr. 2F8h/IRQ3) are automatically disabled, if e.g. a modem card or anything else of COM port will be inserted into the ISA channel.

The following screens are for advanced users and offer functions that are not used frequently.

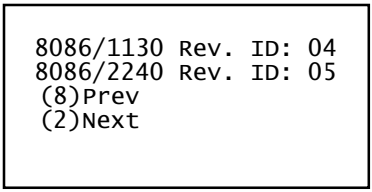


This is the information screen, which will show you the entrance of the normally not used area of the setup part.



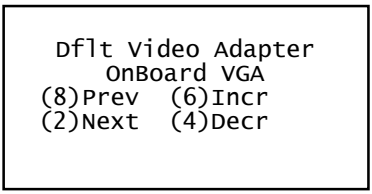
8086/1130 Rev. ID, 8086/2240 Rev. ID

This field displays the revision of the i815E chipset. This is a display only field.



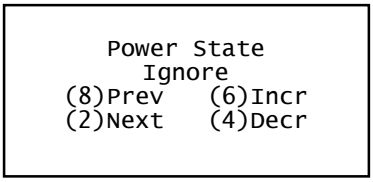
Dflt Video Adapter

The mainboard has an onboard graphic adapter. If your computer has additionally installed a PCI VGA card, 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-card] uses the PCI VGA adapter card as primary card.



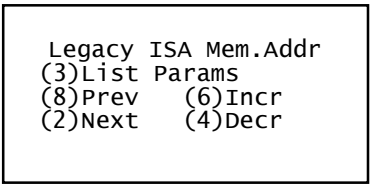
Save and Restore

This allows you to be reboot your system after the power has been interrupted. [Stay Off] leaves your system off and [Save and Restore] reboots your system if it was active before power loss. The third function starts the system after switching off and on the main power line.



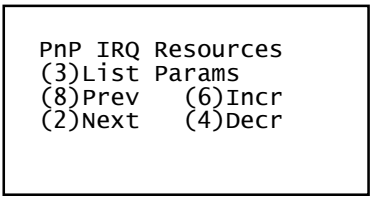
Legacy ISA Memory Addresses

This field allows you to set the base address reserved of a legacy ISA card that uses any memory segment within the CC00h and DFFFh address range. If you have such a card, and you are not using an ICU to specify its address range, select a base address from the available options. If you are using an ICU to accomplis this task, leave Legacy ISA Mem. ADDR to its default setting [available]. The options are: *CC00h-CFFFh, D000h-D3FFh, D400h-D7FFh, D800h-DBFFh,* and *DC00h-DFFFh*. All addresses can be set to reserved or available.



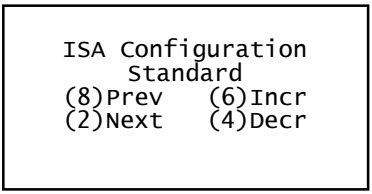
PnP IRQ Resources

These fields indicate whether or not the displayed IRQ for each field is used by a legacy ISA card. Two options are available: *available* and *reserved*. The first option, the default value, indicates either that the displayed IRQ is not used or an ISA Configuration Utility (ICU) is being used to determine if an ISA card is using that IRQ. If you install a legacy ISA card that requires a unique IRQ and you are not using an ICU, you must set the option for that IRQ to *reserved*.



ISA configuration

The use of ISA (legacy) cards is very restricted in this system. All resources from an installed card must be registered during the setup phase before the functions on this card are useable. To make this installation as easy as possible you can select a legacy card from a list of known cards in the setup.
Because of the restricted resources in the chipset it is only possible to select one card at a time.



The known cards by the setup are:

Screen Display	*used I/O resources*
Standard	270-277h; 310-31Fh; 3E8-3EFh
AT COM Board with jumper IO1 open, IO2 open, IO3 open (display as JMP O-O-O)	270-277h; 2E0-2E7h; 300-33Fh; 368-36Fh; 3E0-3EFh
AT COM Board with jumper IO1 closed, IO2 open, IO3 open (display as JMP C-O-O)	270-277h; 300-34Fh; 3E8-3EFh
AT COM Board with jumper IO1 open, IO2 closed, IO3 open (display as JMP O-C-O)	270-277h; 2E0-2E7h; 300-33Fh; 360-36Fh; 3E0-3EFh
ACCTON 1660	240-25Fh; 270-277h; 310-31Fh; 3E8-3EFh
Extern customized	Needs a spec. config utility

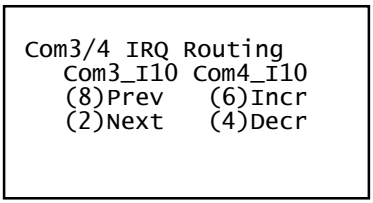
The entry “Extern customized” is implemented to support unknown ISA cards in the BEETLE system. To get this card running, you have to program the I/O parameters with the help of an ISA configuration utility into the CMOS-RAM. After doing so, this entry point can be selected in the setup and is ready to run.

The following display string is only visible if the old DSTN LCD Controller or any other ISA graphic card is installed. In addition, the installation of an AT COM Board is possible. But the jumper configuration on this ComBoard has to be changed from DEFAULT to C-O-O (as known as: IO1 closed, IO2 open, IO3 open).

DSTN-Controller	100-107h; 270-277h; 300-37Fh; 3C0-3DFh; 3E8-3EFh; 46E0-46FFh (memory resources are: A000-BFFFh; C000-CFFFh)

COM3/4 IRQ Routing

This field adjusts the routing of the interrupt lines from the COM3 and 4 serial controllers.



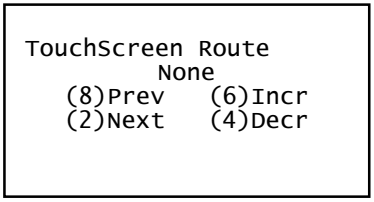
The following table lists the possible combinations:

Screen Display	*COM3*	*COM4*
COM3_I10 COM4_I10	IRQ 10	IRQ 10
COM3_I10 COM4____	IRQ 10	NONE
COM3_I10 COM4_I11	IRQ 10	IRQ 11
COM3____ COM4____	NONE	NONE
COM3____ COM4_I11	NONE	IRQ 11

✪ After changing the IRQ routing it is important to adjust the PnP IRQ resources accordingly!

TouchScreen Route

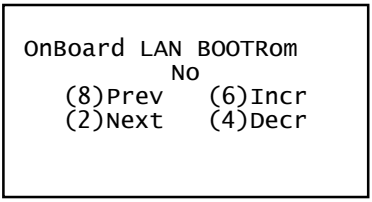
This field determines the routing of the installed touch screen. This setup point is only useful when the LCD screen is adapted to the internal bridge.



✪ After switching to COM1 or COM2 the serial port can not be used by other devices.

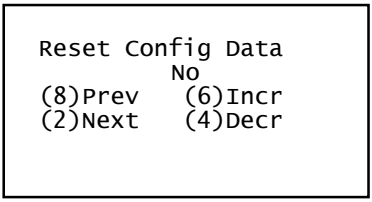
OnBoard LAN BootROM

This setup entry switches on or off the PXE PROM from the onboard LAN sub-modul if it is installed.



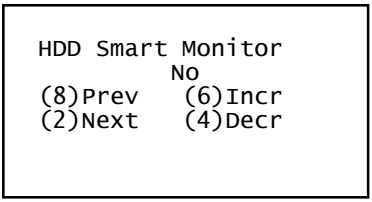
Reset Configuration Data

All data settings of the IRQ, DMA, and memory information of PCI and ISA PnP cards were recorded in a non volatile RAM. To clear this information set the value to *Yes*. This setting will be set to *No* after the next booting of the BEETLE system.



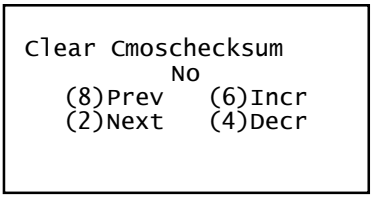
HDD Smart Monitor

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.



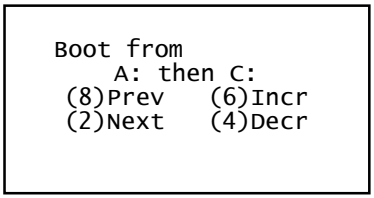
Clear CmosChecksum

This field controls directly the setup entries. After setting this entry to YES and rebooting the system, the CMOS values will be set to their defaults.



Boot Sequence

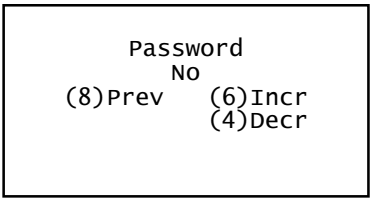
This field determines where the system first looks for an operating system. Options are *A: then C:, C: then A:, C: only*.



Password

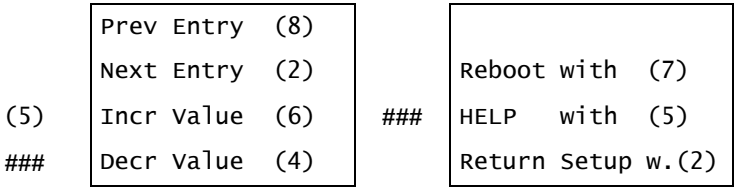
This field allows you to set a password. Before entering the password, press key <6> or <4>. Then type a password of 6 characters. Symbols and other keys are ignored. You have to confirm the entered password. With the entered password

it isn't possible to start up the setup without entering the stored password. To clear the password press key <6> or <4>.



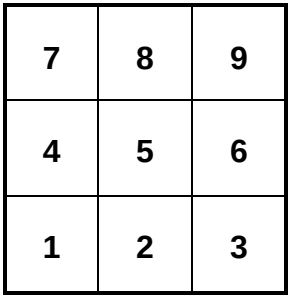
The following keys can be pressed at any time - other than to show or enter the parameters for the IDE drives:

- <5> to show the help screen,
- <7> to complete the setup and reboot the system.



The arrangement of the setup keys on the keyboard is as follows:

- <8> & <2> for the previous and next screen are the top and bottom keys,
- <4> & <6> for more and less values the keys are left and right in one level,
- <5> for the help screen is in the center.



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 successfule> 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 locations.
		IF <checksum good> THEN
		Initialize each slot.
		ELSE
		Display bad config message.
		ENDIF
		ENDIF

52h	KB_TEST	Check for return code of AA from keyboard 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 configura-tion 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 occuring.

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

AEh	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: BEEP Codes

#	Hex code	Beep code		#	Hex code	Beep code
1	01	1-1-1-2		22	16	1-2-2-3
2	02	1-1-1-3		23	17	1-2-2-4
3	03	1-1-1-4		24	18	1-2-3-1
4	04	1-1-2-1		25	19	1-2-3-2
5	05	1-1-2-2		26	1A	1-2-3-3
6	06	1-1-2-3		27	1B	1-2-3-4
7	07	1-1-2-4		28	1C	1-2-4-1
8	08	1-1-3-1		29	1D	1-2-4-2
9	09	1-1-3-2		30	1E	1-2-4-3
10	0A	1-1-3-3		31	1F	1-2-4-4
11	0B	1-1-3-4		32	20	1-3-1-1
12	0C	1-1-4-1		33	21	1-3-1-2
13	0C	1-1-4-2		34	22	1-3-1-3
14	0E	1-1-4-3		35	23	1-3-1-4
15	0F	1-1-4-4		36	24	1-3-2-1
16	10	1-2-1-1		37	25	1-3-2-2
17	11	1-2-1-2		38	26	1-3-2-3
18	12	1-2-1-3		39	27	1-3-2-4
19	13	1-2-1-4		40	28	1-3-3-1
20	14	1-2-2-1		41	29	1-3-3-2
21	15	1-2-2-2		42	2A	1-3-3-3

#	Hex code	Beep code		#	Hex code	Beep code
43	2B	1-3-3-4		65	41	2-1-1-2
44	2C	1-3-4-1		66	42	2-1-1-3
45	2D	1-3-4-2		67	43	2-1-1-4
46	2E	1-3-4-3		68	44	2-1-2-1
47	2F	1-3-4-4		69	45	2-1-2-2
48	30	1-4-1-1		70	46	2-1-2-3
49	31	1-4-1-2		71	47	2-1-2-4
50	32	1-4-1-3		72	48	2-1-3-1
51	33	1-4-1-4		73	49	2-1-3-2
52	34	1-4-2-1		74	4A	2-1-3-3
53	35	1-4-2-2		75	4B	2-1-3-4
54	36	1-4-2-3		76	4C	2-1-4-1
55	37	1-4-2-4		77	4D	2-1-4-1
56	38	1-4-3-1		78	4E	2-1-4-3
57	39	1-4-3-2		79	4F	2-1-4-4
58	3A	1-4-3-3		80	50	2-2-1-1
59	3B	1-4-3-4		81	51	2-2-1-2
60	3C	1-4-4-1		82	52	2-2-1-3
61	3D	1-4-4-2		83	53	2-2-1-4
62	3E	1-4-4-3		84	54	2-2-2-1
63	3F	1-4-4-4		85	55	2-2-2-2
64	40	2-1-1-1		86	56	2-2-2-3

#	Hex code	Beep code		#	Hex code	Beep code
87	57	2-2-2-4		109	6D	2-3-4-2
88	58	2-2-3-1		110	6E	2-3-4-3
89	59	2-2-3-2		111	6F	2-3-4-4
90	5A	2-2-3-3		112	70	2-4-1-1
91	5B	2-2-3-4		113	71	2-4-1-2
92	5C	2-2-4-1		114	72	2-4-1-3
93	5D	2-2-4-2		115	73	2-4-1-4
94	5E	2-2-4-3		116	74	2-4-2-1
95	5F	2-2-4-4		117	75	2-4-2-2
96	60	2-3-1-1		118	76	2-4-2-3
97	61	2-3-1-2		119	77	2-4-2-4
98	62	2-3-1-3		120	78	2-4-3-1
99	63	2-3-1-4		121	79	2-4-3-2
100	64	2-3-2-1		122	7A	2-4-3-3
101	65	2-3-2-2		123	7B	2-4-3-4
102	66	2-3-2-3		124	7C	2-4-4-1
103	67	2-3-2-4		125	7D	2-4-4-2
104	68	2-3-3-1		126	7E	2-4-4-3
105	69	2-3-3-2		127	7F	2-4-4-4
106	6A	2-3-3-3		128	80	3-1-1-1
107	6B	2-3-3-4		129	81	3-1-1-2
108	6C	2-3-4-1		130	82	3-1-1-3

#	Hex code	Beep code		#	Hex code	Beep code
131	83	3-1-1-4		153	99	3-2-3-2
132	84	3-1-2-1		154	9A	3-2-3-3
133	85	3-1-2-2		155	9B	3-2-3-4
134	86	3-1-2-3		156	9C	3-2-4-1
135	87	3-1-2-4		157	9D	3-2-4-2
136	88	3-1-3-1		158	9E	3-2-4-3
137	89	3-1-3-2		159	9F	3-2-4-4
138	8A	3-1-3-3		160	A0	3-3-1-1
139	8B	3-1-3-4		161	A1	3-3-1-2
140	8C	3-1-4-1		162	A2	3-3-1-3
141	8D	3-1-4-2		163	A3	3-3-1-4
142	8E	3-1-4-3		164	A4	3-3-2-1
143	8F	3-1-4-4		165	A5	3-3-2-2
144	90	3-2-1-1		166	A6	3-3-2-3
145	91	3-2-1-2		167	A7	3-3-2-4
146	92	3-2-1-3		168	A8	3-3-3-1
147	93	3-2-1-4		169	A9	3-3-3-2
148	94	3-2-2-1		170	AA	3-3-3-3
149	95	3-2-2-2		171	AB	3-3-3-4
150	96	3-2-2-3		172	AC	3-3-4-1
151	97	3-2-2-4		173	AD	3-3-4-2
152	98	3-2-3-1		174	AE	3-3-4-3

#	Hex code	Beep code
175	AF	3-3-4-4
176	B0	3-4-1-1
177	B1	3-4-1-2
178	B2	3-4-1-3
179	B3	3-4-1-4
180	B4	3-4-2-1
181	B5	3-4-2-2
182	B6	3-4-2-3
183	B7	3-4-2-4
184	B8	3-4-3-1
185	B9	3-23-4-
186	BA	3-4-3-3-
187	BB	3-4-3-4
188	BC	3-4-4-1
189	BD	3-4-4-2
190	BE	3-4-4-3
191	BF	3-4-4-4
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
DIMM	Dual Inline Memory Modul
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
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
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
VGA	Video Graphics Array
WOL	Wake On LAN
WOM	Wake On Modem

Published by
Wincor Nixdorf International GmbH, 2003
D-33094 Paderborn

Printed in Singapore
Order-No.: ***01750042690F***