PCI-765VRE

**PCI Bus Half-Size Transmeta
Low Power CPU Card**

User's Manual

Version 1.1

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Acknowledgments

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Product Model		
Environment to Use	☐OS : ☐Computer Brand : ☐M/B : ☐CPU : ☐Chipset : ☐BIOS : ☐Video Card : ☐Network Interface Card : ☐Other :	
Challenge Description		
Suggestions for NEATEK		

Table of Contents

1

Introduction

Product Description

The PCI-765VRE is a high-performance multimedia CPU card based on the Transmeta Crusoe TM5400/TM5800 processor. The Crusoe processor a revolutionary x86-compatible solution that features:

- Remarkably low power consumption, allowing the processor to run cooler than conventional chips.
- High performance, optimized for real-life usage patterns. Crusoe delivers, whether you're browsing the web, watching a DVD, or recalculating your spreadsheet.
- Full x86 compatibility, so you are free to run the applications and Internet plugins of your choice.

The PCI-765VRE packs all the functions of a versatile system, including audio, SM722 VGA, Intel 82559 Single chip Ethernet. System memory is provided by 64/128/256MB on board and one SODIMM socket that accommodates up to 256MB SDRAM. (Total maximum size=512MB)
The Award BIOS facilitates easy system configuration and peripheral setup. Other advanced features include watchdog timer, *PC/104*, USB, and IrDA interface.

PC/104 is an ISA interface that supports compact-form-factor PC/104 modules (3.6" x 3.8"). It supports self-stacking and pin-and-socket connector. PC/104 features a standard form factor for Embedded applications. It is reliable, small in size and has low power consumption. Flexible mechanical configurations can be attained with PC/104. Modules support various functions such as display, audio, digital I/O, GPS, PCMCIA, fax/modem, Ethernet, SCSI, RS-232/422/485 and SSD.

Checklist

Your PCI-765VRE package should include the items listed below. Damaged or missing items should be reported to your supplier.

- The PCI-765VRE Transmeta Crusoe Half Size PCI CPU Card

- This User's Manual

- One compact disc containing the following:
  - SMI VGA Driver and Flash ROM Utility
  - Intel 82559 Ethernet Drivers
  - VIA 686A, AC97 Audio Drivers
  - 1 x FDD Ribbon Cable
  - 1 x IDE Ribbon Cables
  - 2 x Serial Port Ribbon Cable and 1 Parallel Port Attached to a Mounting Bracket
  - 1 x Audio cable
  - 1 x 3-pin power cable
  - 765A audio daughter card

- Optional cables such as:
  - 2 x USB Cable

Specifications

Processor Supported	Transmeta Crusoe Processor TM5400 533MHz TM5800, 800MHz 66MHz Front Side Bus
Chipset	VIA VT82C686A chipset
BIOS	Award BIOS Supports ACPI, DMI, PnP
System Memory	1x SODIMM socket support up to 256MB capacity, 3.3V
Multi I/O Chipset	VIA VT82C686A chipset
I/O Features	1x FDD (up to 2.88MB, 3 Mode) 1x Parallel Port (EPP, ECP Port) 2x Serial Ports:(1xRS232, 1xRS232/422/485)
Bus Master IDE	40 Pin IDE Connector 2.54mm (Primary) x1 Supports Compact Flash socket Type I (Secondary) x1
On-board VGA	SMI SM722G8 (8MB embedded memory) CRT VGA connector x 1 Supports LVDS connector for DSTN panels Support 40 pin 18/24bit TFT LCD display connector (2.00mm pitch)
On-board Audio	VIA VT82C686A AC97 Digital Audio Controller Optional Audio daughter card (765A) With Line-In, Line-Out, MIC Jacks
On-board Ethernet	Intel 82559 single chip Ethernet controller 10/100Mbps data transfer speeds RJ-45 LAN connector x1
Digital I/O	4 In 4 Out (2x6 pin Header)
Hardware Monitoring	VIA VT82C686A Monitors CPU/system temperature and voltages
USB	Pin header for 2 USB ports (for 4 devices)
Watchdog Timer	32 levels
Expansion slot	PC/104 expansion connector
IrDA	Pin headers for wireless communication
Other Features	AT/ATX power supply select External ATX power connector (5VSB)
Form Factor	Half Size CPU card
Dimensions	185mm x122mm (7.2" x 4.8")

Board Dimensions (1)

Board Dimensions (2)

*Note: The above drawing shows the locations of the SODIMM
memory socket and the Compact Flash (Type 1) socket.*
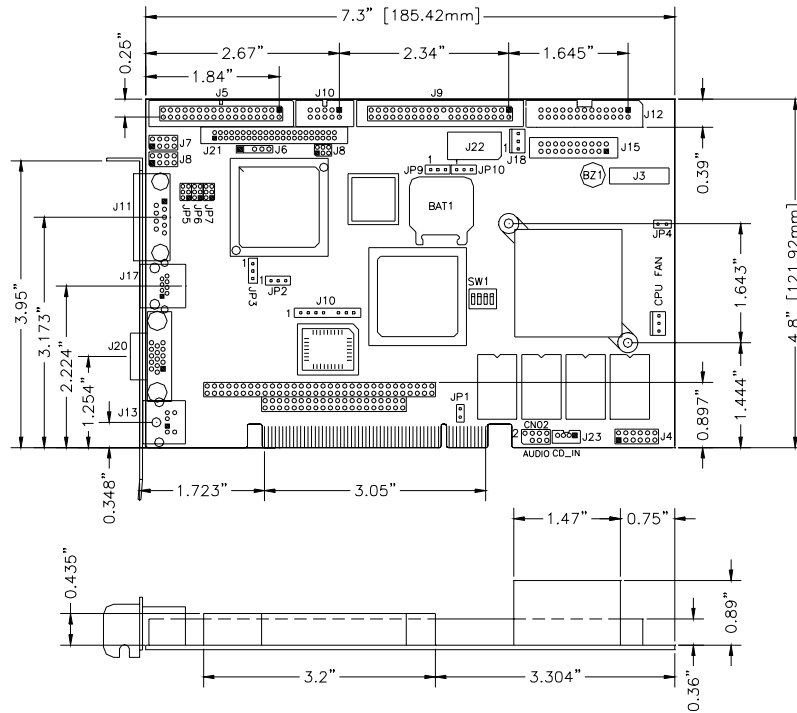
2

Installations

This section provides information on how to use the jumpers and connectors on the PCI-765VRE in order to set up a workable system. The topics covered are:

Installing the Memory (SODIMM)

The PCI-765VRE has a 144-pin SODIMM socket on the reverse side of the CPU card. The SODIMM socket, J1 connector, supports a maximum total memory of 256MB in SDRAM single side type. The memory capacities supported are 64MB, 128MB and 256MB.

Installing and Removing DIMMs

To install the SODIMM, locate the memory slot on the CPU card and perform the following steps:

1. Hold the SODIMM so that the two keys of the DIMM align with those on the memory slot.

2. Gently push the SODIMM in an upright position until the clips of the slot close to hold the DIMM in place when the SODIMM touches the bottom of the slot.

3. To remove the SODIMM, press the clips with both hands.
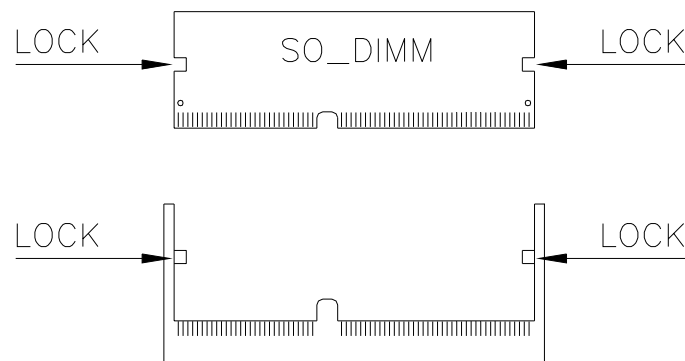
Top View of SODIMM Socket

Note: Do not add or replace the memory chips installed on the board without consulting the manufacturer

AT / ATX Power Select

Use JP2 to select the power supply type whether is an AT or ATX one

JP2: AT / ATX POWER SELECT
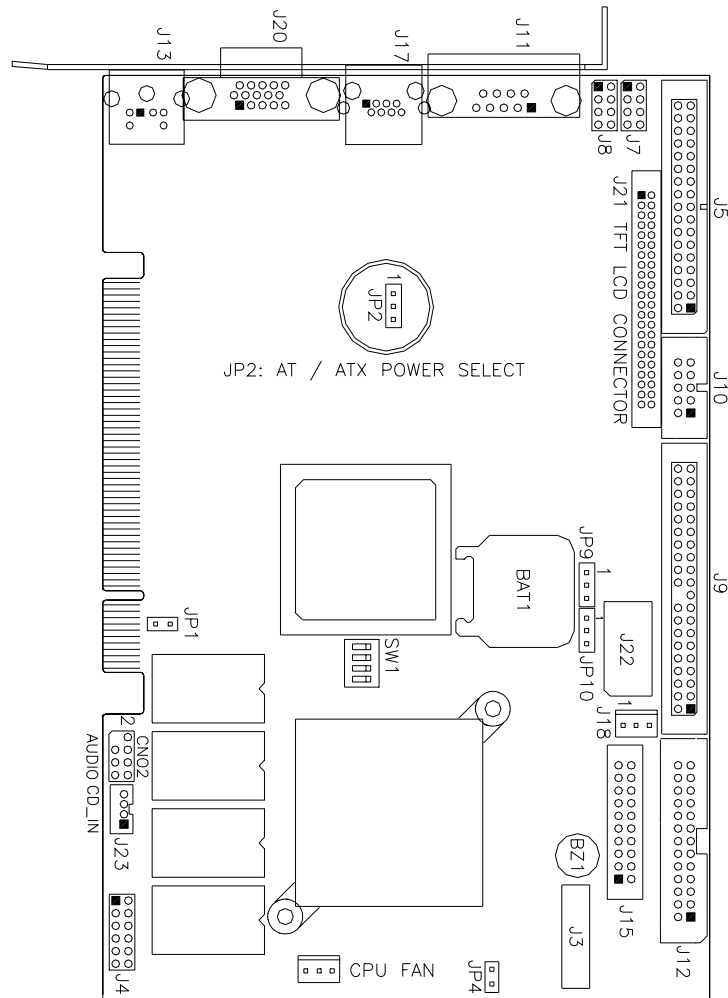
Jumpers on PCI-765VRE

Jumpers are used on the PCI-765VRE to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on PCI-765VRE and their respective functions.
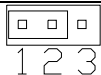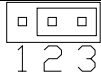
Jumper Locations on PCI-765VRE

JP2: AT/ATX Power Supply Select
JP3: Clear CMOS Content
JP4: CompactFlash Master/Slave Select
JP5, JP6, JP7: RS232/RS422/RS485 (COM2) Selection
JP8: COM1/2 RS232 +5V / +12V Power Setting
JP9: On Board LAN Select
JP10: LCD Panel Power Select
SW1: Panel /Resolution Switch Setting

JP2: AT/ATX Power Supply Select

JP2	Setting	Function
□ □ □ 1 2 3	Pin 1-2 Short/Closed	AT Power Supply
□ □ □ 1 2 3	Pin 2-3 Short/Closed	ATX Power Supply

Notes:
1. When using AT power supply, set the ACPI Function in the Power Management Setup of the BIOS to Disabled.
2. When using ATX power supply, set the ACPI Function in the Power Management Setup of the BIOS to Enabled.

JP3: Clear CMOS Content
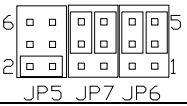
JP3	Setting	Function
□ □ □ 3 2 1	Pin 1-2 Short/Closed	Normal Operation
□ □ □ 3 2 1	Pin 2-3 Short/Closed	Clear CMOS Content

JP4: CompactFlash Master/Slave Select
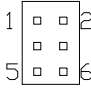
JP4	Setting	Function
□ □	Closed	Master
□ □	Open	Slave

Note: If the board does not have the JP4 connector, the manufacturer's default setting for the Compact Flash Select is MASTER only.

JP5, JP6, JP7: RS232/RS422/RS485 (COM2) Selection

JP5 JP6, JP7	Pin Short	Function
JP5 JP7 JP6	JP5: 1-2 JP6: 3-5, 4-6 JP7: 3-5, 4-6	RS232
JP5 JP7 JP6	JP5: 3-4 JP6: 1-3, 2-4 JP7: 1-3, 2-4	RS422
JP5 JP7 JP6	JP5: 5-6 JP6: 1-3, 2-4 JP7: 1-3, 2-4	RS485

JP8: COM1/2 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP8	Signal Name	Pin #
1	+5V		+5V	2
3	NRIA		NRIB	4
5	+12V		+12V	6

   COM1 Settings: Pin 1-3 short = +5V, Pin 3-5 short = +12V
   COM2 Settings: Pin 2-4 short = +5V, Pin 4-6 short = +12V

JP9: On Board LAN Select

JP9	Setting	Function
1 2 3	Pin 1-2 Short/Closed	LAN Enable
1 2 3	Pin 2-3 Short/Closed	LAN Disable

JP10: LCD Panel Power Select

JP10	Setting	Function
□ □ □ 1 2 3	Pin 1-2 Short/Closed	5V
□ □ □ 1 2 3	Pin 2-3 Short/Closed	3.3V

SW1: Panel/Resolution Switch Setting

Panel ID	SW 1-1	SW 1-2	SW 1-3	SW 1-4	Panel Type
0	ON	ON	ON	ON	640x480 TFT(18-bit)
1	OFF	ON	ON	ON	640x480 DSTN
2	ON	OFF	ON	ON	800x600 TFT(18-bit)
3	OFF	OFF	ON	ON	800x600 DSTN
4	ON	ON	OFF	ON	1024x768TFT(18-bit)
5	OFF	ON	OFF	ON	1024x768 DSTN
6	ON	OFF	OFF	ON	Reserved
7	OFF	OFF	OFF	ON	Reserved
8	ON	ON	ON	OFF	Reserved
9	OFF	ON	ON	OFF	800x600 TFT(24-bit)
10	ON	OFF	ON	OFF	Reserved
11	OFF	OFF	ON	OFF	*NEC 8008600(18-bit)
12	ON	ON	OFF	OFF	1024X768(24-bit)
13	OF	ON	OFF	OFF	Reserved
14	ON	OFF	OFF	OFF	Reserved

* NEC Panel Model No.: NL8060BC26-17

Flat Panel Interface Pin Listing for DSTN & Color TFT LCD

PIN NAME	DSTN		TFT			
Pin Name	16-bit	24-bit	9-bit	12-bit	18-bit	24-bit
LP/FHSYNC	LP	LP	HSYNC	HSYNC	HSYNC	HSYNC
FP/FVSYNC	FP	FP	VSYNC	VSYNC	VSYNC	VSYNC
FPSCLK	XCK	XCK	CK	CK	CK	CK
DE			ENAB	ENAB	ENAB	ENAB
FPEN	FPEN	FPEN	FPEN	FPEN	FPEN	FPEN
FPVDDEN	VDD	VDD	VDD	VDD	VDD	VDD
VBIASEN	VEE	VEE	VEE	VEE	VEE	VEE
FPDATA23		UD11				R7
FPDATA22		UD10				R6
FPDATA21		UD9			R5	R5
FPDATA20		UD8			R4	R4
FPDATA19	UD7	UD7		R3	R3	R3
FPDATA18	UD6	UD6	R2	R2	R2	R2
FPDATA17	UD5	UD5	R1	R1	R1	R1
FPDATA16	UD4	UD4	R0	R0	R0	R0
FPDATA15	UD3	UD3				G7
FPDATA14	UD2	UD2				G6
FPDATA13	UD1	UD1			G5	G5
FPDATA12	UD0	UD0			G4	G4
FPDATA11		LD11		G3	G3	G3
FPDATA10		LD10	G2	G2	G2	G2
FPDATA9		LD9	G1	G1	G1	G1
FPDATA8		LD8	G0	G0	G0	G0
FPDATA7	LD7	LD7				B7
FPDATA6	LD6	LD6				B6
FPDATA5	LD5	LD5			B5	B5
FPDATA4	LD4	LD4			B4	B4
FPDATA3	LD3	LD3		B3	B3	B3
FPDATA2	LD2	LD2	B2	B2	B2	B2
FPDATA1	LD1	LD1	B1	B1	B1	B1
FPDATA0	LD0	LD0	B0	B0	B0	B0

Dual Panel Interface (One Digital Panel and one LVDS Panel)

Pin name	Digital panel & LVDS	24-bit TFT
DE	DE	DE
FP_FHSYNC	FP_FVSYNC	FP_FVSYNC
LP_FHSYNC	LP_FHSYNC	LP_FHSYNC
FPSCLK	FPSCLK	FPSCLK
FPEN	FPEN	FPEN
FPVDDEN	FPVDDEN	FPVDDEN
VBIASEN	VBIASEN	VBIASEN
FPDATA23	R7	R7
FPDATA22	R6	R6
FPDATA21	R5	R5
FPDATA20	R4	R4
FPDATA19	R3	R3
FPDATA18	R2	R2
FPDATA17	R1	R1
FPDATA16	R0	R0
FPDATA15	G7	G7
FPDATA14	G6	G6
FPDATA13	G5	G5
FPDATA12	G4	G4
FPDATA11	G3	G3
FPDATA10	G2	G2
FPDATA09	G1	G1
FPDATA08	G0	G0
FPDATA07	B7	B7
FPDATA06	B6	B6
FPDATA05	B5	B5
FPDATA04	B4	B4
FPDATA03	B3	B3
FPDATA02	B2	B2
FPDATA01	B1	B1
FPDATA00	B0	B0
TxOUT0+-	Rxin0+-	
TxOUT1+-	Rxin1+-	
TxOUT2+-	Rxin2+-	
TxOUT3+-	Rxin3+-	
TxCLKOUT+-	RxCLKIN+-	

Connectors on PCI-765VRE

   The connectors on PCI-765VRE allow you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on PCI-765VRE and their respective functions.

Connector Locations on PCI-765VRE
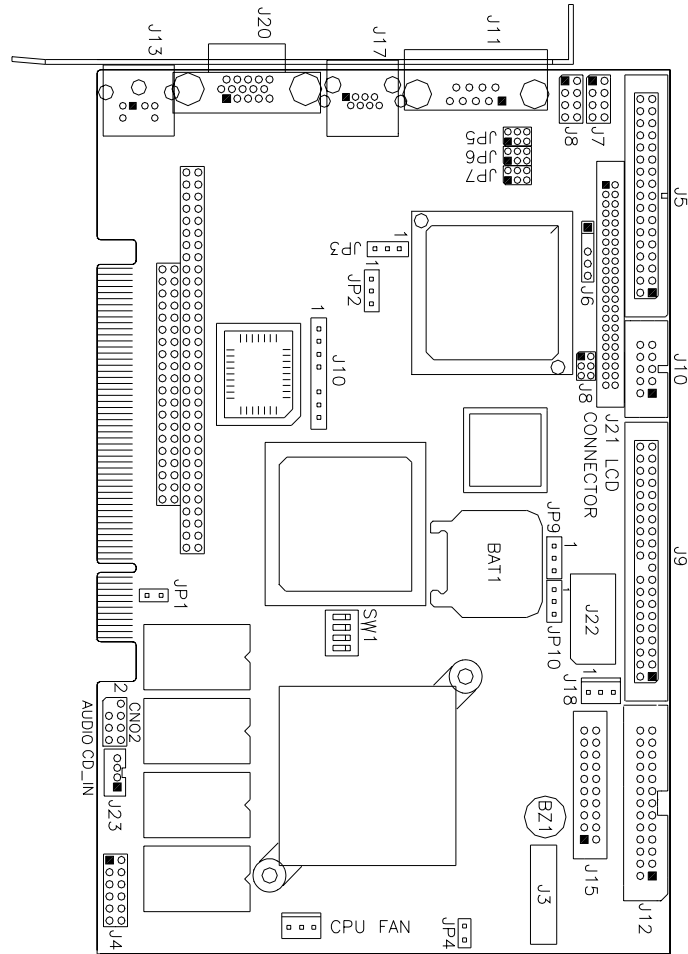
Connectors on PCI-765VRE
CNO2: Audio Connector for Line-In, Line-Out,MIC. Jack
J3: CMS Debug Connector
J4: Digital I/O Connector (4 in, 4 out)
J5: Floppy Drive Connector
J6: IrDA Connector
J7, J8: USB Connectors
J9: Primary IDE Connector 40-pin (2.54mm)
J11, J10: Serial Ports
J12: Parallel Port Connector
J13: PS/2 Keyboard and Mouse Connector
J15: System Function Connector
J16: CPU Fan Power Connector
J17: RJ-45 LAN Connector
J18: External ATX Power Connector
J20: VGA CRT Connector
J21: TFT LCD Panel Connector
J22: 24-Bit LVDS Connector (DF13-20)
J23: CD-In Audio Connector
CON1A, CON1B: PC-104 Connector

CNO2: Audio Connector for Line-In, Line-Out, MIC Jack

Signal Name	Pin	Pin	Signal Name
NC	1	2	Mic
Line_In_L	3	4	Line_In_R
Line_Out_L	5	6	Line_Out_R
Gnd	7	8	Ground

CN02 is used to connect to the 765A audio daughter board.
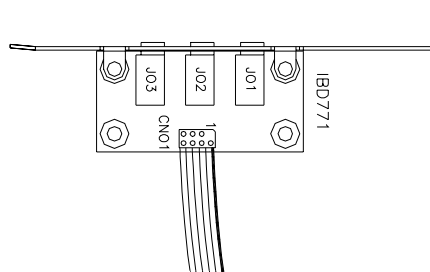
J3: CMS Debug Connector

J4: Digital I/O Connector (4 in, 4 out)
This 12-pin Digital I/O connector supports TTL levels and is used to control external devices requiring ON/OFF circuitry.

Signal Name	Pin #	Pin #	Signal Name
IN0	1	7	+5V
IN1	2	8	OUT0
IN2	3	9	Ground
IN3	4	10	OUT1
GROUND	5	11	+12V
OUT2	6	12	OUT3

J5: Floppy Drive Connector
J5 of the PCI-765VRE is a 34-pin header and will support up to 2.88MB FDD.
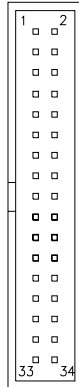
Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

J6: IrDA Connector
This connector is used for an IrDA connector for wireless communication.
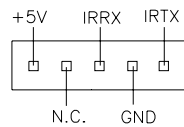
Pin #	Signal Name
1	+5V
2	No Connect
3	Ir RX
4	Ground
5	Ir TX

J7, J8: USB Connectors
J7 (USB0, USB1) and J8 (USB2, USB3) are the on board USB pin headers connectors. Overall, the two sets of pin headers support four USB ports.

1 □ □ 8
    □ □
    □ □
4 □ □ 5
J7 / J8
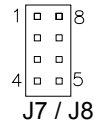
Signal Name	Pin	Pin	Signal Name
Vcc	1	8	Ground
USB0-	2	7	USB1+
USB0+	3	6	USB1-
Ground	4	5	Vcc

J9: Primary IDE Connector 40 Pin (2.54mm)
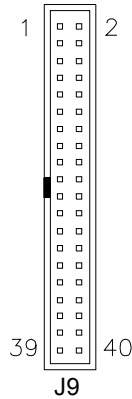
Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Protect pin
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

1 □ □ 2
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39 □ □ 40
J9

J11, J10: Serial Ports
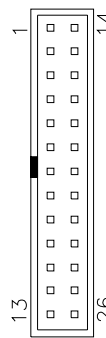
J11 (COM1) is a DB-9 connector, while J10 (COM2) is a 10-pin header connector. Refer to the table below for their pin assignments.

COM1   COM2
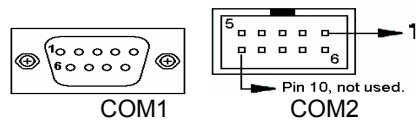
Signal Name	Pin #	Pin #	Signal Name
DCD, Data carrier detect	1	6	DSR, Data set ready
RXD, Receive data	2	7	RTS, Request to send
TXD, Transmit data	3	8	CTS, Clear to send
DTR, Data terminal ready	4	9	RI, Ring indicator
GND, ground	5	10	Not Used

J12: Parallel Port Connector

The following table describes the pin out assignments of this connector.

Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

J13: PS/2 Keyboard and Mouse Connector
J13 uses a Y-cable with dual D-connectors for a PS/2 keyboard and a PS/2 mouse.
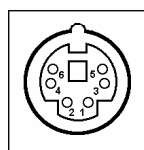
Pin #	Signal Name
1	Keyboard data
2	Mouse data
3	Ground
4	Vcc
5	Keyboard Clock
6	Mouse Clock

J13

J15: System Function Connector
The System Function Connector provides interfaces for light indicators of system activities (HDD/Power) and computer status switches.

Hard Disk Drive LED — Reset Switch
Reserved — ATX Power On Switch
Speaker — Power LED
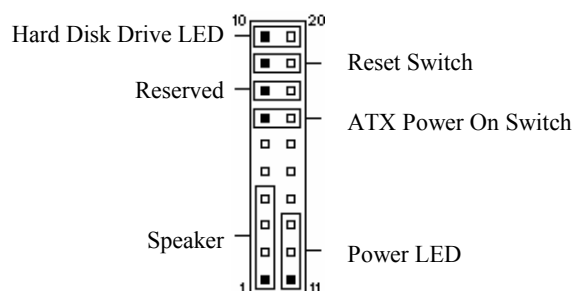
Speaker: Pins 1 - 4
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.

Pin #	Signal Name
1	Speaker out
2	No connect
3	Ground
4	+5V

ATX Power ON Switch: Pins 7 and 17
This 2-pin connector connects to the power switch. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.
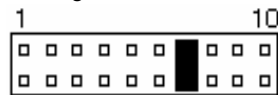
Power LED: Pins 11 - 13
The power LED indicates the status of the main power switch.
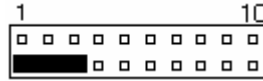
Pin #	Signal Name
11	Power LED
12	No connect
13	Ground

Reset Switch: Pins 9 and 19
The reset switch allows the user to reset the system without turning the main power switch off and then on. Orientation is not required when making a connection to this header.
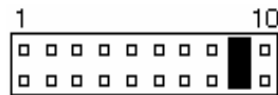
Hard Disk Drive LED Connector: Pins 10 and 20
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.
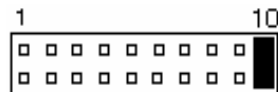
J16: CPU Fan Power Connector
J16 is a 3-pin header for a CPU fan. The fan must be a 5V fan.

Pin #	Signal Name
1	Rotation
2	+5V
3	Ground

J17: RJ45 LAN Connector

The figure below shows the pin out assignments of the connector and its corresponding input jack.

RJ-45
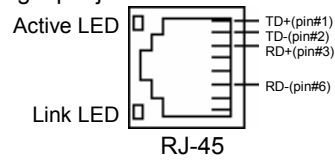
J18: External ATX Power Connector

Pin #	Signal Name
1	5VSB (Standby +5V)
2	Ground
3	PS-ON (soft on/off)

J20: VGA CRT Connector

The pin assignments of the J20 VGA CRT connector are as follows:
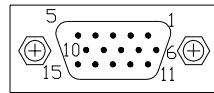
J20

Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	N.C.
HSYNC	13	14	VSYNC
NC	15		

J21: TFT LCD Panel Connector
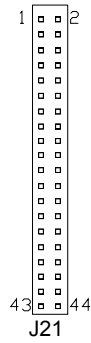
Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
Ground	3	4	Ground
+5V/3.3V	5	6	+5V/3.3V
VBIASEN	7	8	Ground
P0	9	10	P1
P2	11	12	P3
P4	13	14	P5
P6	15	16	P7
P8	17	18	P9
P10	19	20	P11
P12	21	22	P13
P14	23	24	P15
P16	25	26	P17
P18	27	28	P19
P20	29	30	P21
P22	31	32	P23
Ground	33	34	Ground
SHFCLK	35	36	FP/FVSYNC
NP_FPDE	37	38	LP/FHSYNC
Ground	39	40	FPEN
Ground	41	42	FPVDDEN
+5V/3.3V	43	44	+5V/3.3V

Warning: This connector is used for TFT LCD panels. Do not connect this as an IDE interface; otherwise, the IDE device will be damaged!

J22: 24-Bit LVDS Connector (DF13-20)

Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
TX3-	10	9	TX3+
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

HOW TO CONNECT THE LVDS CONNECTOR TO THE LCD PANEL

J23: CD-In Audio Connector

Pin #	Signal Name
1	CD Audio L
2	Ground
3	Ground
4	CD Audio R

CON1A, CON1B: PC-104 Connector
CON1A and CON1B are dual-in-line pin headers that support PC-104 modules. CON1Aconsists of 64 pins and CON1B has 40 pins.
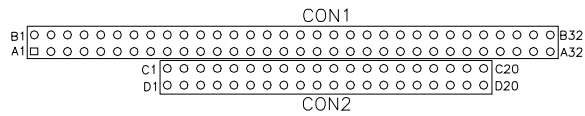
CON1A				CON1B			
Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	IOCHK	B1	GND	C1	GND	D1	GND
A2	D7	B2	REST	C2	SBHE	D2	MEMCS16
A3	D6	B3	VCC	C3	LA23	D3	IOCS16
A4	D5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	D4	B5	-5V	C5	LA21	D5	IRQ11
A6	D3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	D2	B7	-12V	C7	LA19	D7	IRQ15
A8	D1	B8	OWS	C8	LA18	D8	IRQ14
A9	D0	B9	+12V	C9	LA17	D9	DACK0
A10	IOCHRDY	B10	Key Pin	C10	MEMR	D10	DRQ0
A11	AEN	B11	SMEMW	C11	MEMW	D11	DACK5
A12	A19	B12	SMEMR	C12	D8	D12	DRQ5
A13	A18	B13	IOW	C13	D9	D13	DACK6
A14	A17	B14	IOR	C14	D10	D14	DRQ6
ZA15	A16	B15	DACK3	C15	D11	D15	DACK7
A16	A15	B16	DRQ3	C16	D12	D16	DRQ7
A17	A14	B17	DACK1	C17	D13	D17	VCC
A18	A13	B18	DRQ1	C18	D14	D18	MASTER
A19	A12	B19	REFRESH	C19	D15	D19	GND
A20	A11	B20	CLK	C20	KEY PIN	D20	GND
A21	A10	B21	IRQ7				
A22	A9	B22	IRQ6				
A23	A8	B23	IRQ5				
A24	A7	B24	IRQ4				
A25	A6	B25	IRQ3				
A26	A5	B26	DACK2				
A27	A4	B27	TC				
A28	A3	B28	BALE				
A29	A2	B29	VCC				
A30	A1	B30	OSC				
A31	A0	B31	GND				
A32	GND	B32	GND				

Watchdog Timer Configuration

The function of the watchdog timer is to reset the system automatically and is defined at I/O port 0443H. To enable the watchdog timer and allow the system to reset, write I/O port 0443H. To disable the timer, write I/O port 0441H for the system to stop the watchdog function. The timer has a tolerance of 20% for its intervals.

The following describes how the timer should be programmed.

Enabling Watchdog:

MOV   AX, 000FH (Choose the values from 0)
MOV   DX, 0443H
OUT   DX, AX

Disabling Watchdog

MOV   AX, 00FH (Any value is fine.)
MOV   DX, 0441H
OUT   DX, AX

WATCHDOG TIMER CONTROL TABLE

Level	Value	Time/sec	Level	Value	Time/sec
1	1F	0	9	17	8
2	1E	1	10	16	9
3	1D	2	11	15	10
4	1C	3	12	14	11
5	1B	4	13	13	12
6	1A	5	14	12	13
7	19	6	15	11	14
8	18	7	16	10	15
Level	**Value**	**Time/sec**	**Level**	**Value**	**Time/sec**
17	0F	16	25	07	24
18	0E	17	26	06	25
19	0D	18	27	05	26
20	0C	19	28	04	27
21	0B	20	29	03	28
22	0A	21	30	02	29
23	09	22	31	01	30
24	08	23	32	00	31

3

BIOS Setup

This section describes the different settings available in the Award BIOS that comes with the PCI-765VRE embedded board. The topics covered in this section are as follows:

BIOS Introduction

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

BIOS Setup

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

Press <DEL> to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

CMOS Setup utility – Copyright © 1984-2001 Award Software

Standard CMOS Features	Load Fail-Safe Defaults
Advanced BIOS Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configuration	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

   The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section that displays information about the currently highlighted item in the list.

Note: *If your computer cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

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

CMOS Setup utility – Copyright © 1984-2001 Award Software
Standard CMOS Features

Date (mm:dd:yy)	: Thu, May 18 2000	Item Help
Time (hh:mm:ss)	: 00 : 00 : 00	Menu Level
IDE Primary Master	[None]	
IDE Primary Slave	[None]	Change the day, month,
IDE Secondary Master	[None]	Year and century
IDE Secondary Slave	[None]	
Drive A	[1.44M, 3.5 n.]	
Drive B	[None]	
Video	[EGA/VGA]	
Halt On	[All errors]	
Base Memory	640K	
Extended Memory	48128K	
Total Memory	49152K	

↑↓→Move   Enter:Select   +/-/PU/PD:Value   F10:Save   ESC:Exit   F1:General Help
F5:Previous Values   F6:Fail-Safe Defaults   F7:Optimized Defaults

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date
The date format is:
    Day :   Sun to Sat
    Month : 1 to 12
    Date :   1 to 31
    Year :   1994 to 2079
To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour   : 00 to 23**
                           Minute : 00 to 59
                           Second :   00 to 59

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

Primary HDDs / Secondary HDDs

  The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

  To enter the specifications for a hard disk drive, you must select first a "Type". There are 45 predefined types and 4 user definable types are for Enhanced IDE BIOS. Type 1 to 45 are predefined. Type "User" is user-definable. For the Primary Master/Slave as well as Secondary Master/Slave, you can select "Auto" under the TYPE and MODE fields. This will enable auto detection of your IDE drives and CD-ROM drive during POST.

  Press <PgUp>/<PgDn> to select a numbered hard disk type or type the number and press the <Enter> key. The hard disk will not work properly if you enter incorrect information for this field. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually. If you select Type User, related information is asked to be entered to the following items.

      CYLS :   Number of cylinders
      HEAD :   Number of read/write heads
      PRECOMP :   Write precompensation
      LANDZ :   Landing zone
      SECTOR :   Number of sectors
      SIZE :   Automatically adjust according to the configuration
      MODE (for IDE HDD only) :   Auto
                                    Normal (HD < 528MB)
                                    Large   (for MS-DOS only)
                                    LBA   (HD > 528MB and supports
                                                       Logical Block Addressing)

NOTE: The specifications of your drive must match with the drive table. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

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

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

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

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

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

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

BIOS Features Setup

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

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Advanced BIOS Features

Virus Warning	**: Disabled**	Item Help
CPU Internal Cache	: Enabled	
Quick Power On Self Test	: Enabled	Menu Level
First Boot Device	: Floppy	
Second Boot Device	: HDD-0	Allows you to choose the VIRUS
Third Boot Device	: CDROM	warning feature for IDE Hard
Boot Other Device	: Enabled	Disk boot sector protection. If
Swap Floppy Drive	: Disabled	this function is enabled and
Boot Up Floppy seek	: Disabled	someone attempt to write data
Boot Up Numlock Status	: On	into this area, BIOS will show a
Typematic Rate Setting	: Disabled	warning message on screen and
Typematic Rate (chars/Sec)	: 6	alarm beep.
Typematic Delay (Msec)	: 250	
Security Option	: Setup	
OS Select For DRAM>64MB	: Non-OS2	
Report No FDD For WIN 95	: No	
Video BIOS Shadow	: Enabled	
C8000-CBFFF Shadow	: Disabled	
CC000-CFFFF Shadow	: Disabled	
D0000-D3FFF Shadow	: Disabled	
D4000-D7FFF Shadow	: Disabled	
D8000-DBFFF Shadow	: Disabled	
DC000-DFFF Shadow	: Disabled	
CPU support CMPXCHG8B	: Disabled	

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem. Note that some diagnostic programs would attempt to access the boot sector table and can cause the virus warning. Disable the Virus Warning feature when this happens.

CPU Internal Cache

This item allows you to enable (speed up memory access) or disable the cache function. By default, these items are *Enabled*.

Quick Power On Self Test

This choice speeds up the Power On Self Test (POST) after you power up the system. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device, Boot Other Device

These fields determine the drives that the system searches for an operating system. The default for the boot devices according to sequence are Floppy, HDD-0 and LS120.

Swap Floppy Drive

This item allows you to determine whether or not to enable the swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to *Disabled.*

Boot Up Floppy Seek

When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 760K, 1.2M and 1.44M all have 80 tracks. By default, this field is set to *Enabled.*

Boot Up NumLock Status

This allows you to activate the NumLock function after you power up the system. By default, the system boots up with *NumLock* On.

Typematic Rate Setting

When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to *Disabled.*

Typematic Rate (Chars/Sec)

When the typematic rate is enabled, the system registers repeated keystrokes speeds. You can select speed range from 6 to 30 characters per second. By default, this item is set to *6.*

Typematic Delay (Msec)

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to *250msec.*

Security Option

This field allows you to limit access to the System and Setup. The default value is *Setup*. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is **NON-OS/2**.

Report No FDD for WIN 95

This option allows Windows 95 to share with other peripherals IRQ6 that is assigned to a floppy disk drive if the drive is not existing. The default setting is *No*.

Video BIOS Shadow

This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

C8000 - CBFFF Shadow/DC000 - DFFFF Shadow

Shadowing a ROM reduces the memory available between 640KB to 1024KB. These fields determine whether or not optional ROM will be copied to RAM.

CPU support CMPXCHG8B

This field is related to Transmeta Crusoe's supporting Windows XP operating system. To support Windows XP, enable this field. For other operating systems, set this field as *Disabled*.

Small Logo (EPA) Show

This field enables the showing of the EPA logo located at the upper right of the screen during boot up.

Integrated Peripherals

This option allows you to determine your hard disk configuration, mode and port.

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Integrated Peripherals

OnChip IDE Channel0	: Enabled	Item Help
OnChip IDE Channel1	: Enabled	Menu Level
IDE Prefetch Mode	: Disabled	
Primary Master PIO	: Auto	
Primary Slave PIO	: Auto	
Secondary Master PIO	: Auto	
Secondary Slave PIO	: Auto	
Primary Master UDMA	: Auto	
Primary Slave UDMA	: Auto	
Secondary Master UDMA	: Auto	
Secondary Slave UDMA	: Auto	
OnChip USB	: Enabled	
USB Keyboard support	: Disabled	
AC97 Audio	: Auto	
Digital I/O Port	: 240h	
IDE HDD Block Mode	: Enabled	
Onboard FDD Controller	: Enabled	
Onboard Serial Port 1	: 3F8/IRQ4	
Onboard Serial Port 2	: 2F8/IRQ3	
UART 2 Mode	: Standard	
Onboard Parallel Port	: 378/IRQ7	
Onboard Parallel Mode	: Normal	
ECP Mode Use DMA	: 3	
Parallel Port EPP Type	: EPP1.9	

OnChip IDE Channel0/1

These fields enable or disable the first and second IDE channels on board. Each channel supports two IDE devices.

IDE Prefetch Mode

These field enables/disables the prefetch buffers in the PCI IDE controller. The prefetch buffers are used as a temporary storage place as data is transferred from one location to another.

IDE Primary Master/Slave PIO, Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE Primary Master/Slave UDMA, Secondary Master/Slave UDMA
 Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.

On-Chip Primary/Secondary PCI IDE
 The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

OnChip USB
 This field enables/disables the USB function on board.

USB Keyboard Support
 When the OnChip USB field is enabled, this field can enable the USB keyboard.

AC97 Audio
 The default setting of *Auto* enables the AC97 audio if it is detected.

Digital I/O
 The default setting of the digital I/O is *240h*.

Onboard FDD Controller
 This should be enabled if your system has a floppy disk drive (FDD) installed and you wish to use it.

Onboard Serial/Parallel Port
 These fields allow you to select the onboard serial/parallel port and its address. The default values for these ports are:
    Serial Port 1   3F8/IRQ4
    Serial Port 2   2F8/IRQ3
    Parallel Port   378H/IRQ7

UART 2 Mode
 This item allows you to determine which Infra Red (IR) function of onboard I/O chip. The options are *Standard*, *IrDA*, and *ASKIR*.

Onboard Parallel Mode

This field allows you to determine parallel port mode function.

Normal	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port
ECP+EPP	Extended Capabilities Port or Enhanced Parallel Port

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn off video display after a period of inactivity.

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Power Management Setup

ACPI Function	Disabled	
Power Management	User Define	Menu Level
Video Off Method	DPMS Supports	
Standby Mode	Disabled	
HDD Power Down	Disabled	
Soft-off by PBTN	Instant -off	
Power-Supply Type	Auto	
PWRON After PWR-Fail	off	
Thermal Duty Cycle	50%	
RI Resume IRQ	3	
Wake-Up by PCI Card(PME)	Disabled	
RTC Resume	Disabled	
IRQ Wakeup Events	Press Enter	
VGA	OFF	
LPT & COM	LPT/COM	
HDD & FDD	ON	
PCI master	OFF	

ACPI Function

By default, the ACPI function is disabled.

Power Management

This field allows you to select the type of power saving management modes. The options are as follows:

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

Video Off Method

This field defines the Video Off features. There are three options.
V/H SYNC + Blank: blank the screen and turn off vertical and horizontal scanning.
DPMS: allows the BIOS to control the video display card.
Blank Screen: This option only writes blanks to the video buffer.

Standby Mode
  After the selected period of system inactivity, the fixed disk drive and the video shut off while all other devices still operate at full speed.

HDD Power Down
  When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Power-Supply Type
  This field that power supply type that the system is using AT or ATX POWER.

PWRON After PWR-Fail
  This field sets the status of the system when it powers back from a power failure. The default setting is *off*.

Thermal Duty Cycle
  This field sets the percentage to which the processor's speed drops when the CPU warning temperature threshold has been reached. The default setting is *50%*.

Modem Use IRQ
  The IRQ used by the modem can be set to *NA*, *3*, *4*, *5*, *7*, *9*, *10* and *11*.

RTC Resume
  This disables/enables the wake function activated by a signal from the Real-Time Clock. When enabled, the user can manually input the time (hh:mm:ss) that the system should awaken from suspend mode.

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

PNP/PCI Configuration

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

CMOS Setup utility – Copyright © 1984-2001 Award Software
PnP/PCI Configurations

PNP OS Installed	No	Item Help
Reset Configuration Data	Disabled	
		Menu Level
Resources Controlled By	Manual	
IRQ Resources	Press Enter	Select Yes if you are using a
DMA Resources	Press Ente	Plug and Play capable operating system. Select No if you need
		the BIOS to configure non-boot
PCI/VGA Palette Snoop	Disabled	devices.

PNP OS Installed

Select *Yes* if the system operating environment is Plug-and-Play aware (e.g., Windows 95). The options: Yes and No.

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot. The options: Enabled and Disabled.

Resources Controlled by

The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assign them. The options: Auto and Manual.

PCI/VGA Palette Snoop

Enabling this item informs the PCI VGA card to keep silent (and to prevent conflict) when palette register is updated (i.e., accepts data without responding any communication signals). This is useful only when two display cards use the same palette address and plugged in the PCI bus at the same time (such as MPEQ or Video capture). In such case, PCI VGA is silent while MPEQ/Video capture is set to function normally.

PC Health Status

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

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PC Health Status

CPU Warning Temperature	Disabled	Item Help
Current CPU Temp.	48°C/118°F	Menu Level
Current System Temp.	41°C/105°F	
Current CPUFan Speed	0 RPM	
Vcore	1.6V	
2.5V	2.53V	
3.3V	3.39V	
5V	5.10V	
12V	11.82V	

Current CPU/System Temp.

These read-only fields reflect the functions of the hardware thermal sensor that monitors the CPU/system temperatures.

Current CPU Fan

These read-only fields show the current speeds in RPM for the CPU fans as monitored by the hardware monitoring function.

Vcore/2.5V/3.3V/5.V/12V

These read-only fields show the current voltages in the voltage regulators and power supply as monitored by the hardware monitoring function.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Supervisor / User Password

These two options set the system password. *Supervisor Password* sets a password that will be used to protect the system and Setup utility. *User Password* sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The **Enter Password:** message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

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

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.

4

LAN Drivers Installation

This section describes LAN features and driver installation of the Intel 82559 Ethernet function.

The following items are covered in this section:

Introduction

  Intel 82559 a 32-bit 10/100MBps Ethernet controller for PCI local
bus-compliant PCs. It supports bus mastering architecture, and
auto-negotiation feature that can be used for both 10Mbps and 100Mbps
connection.

Making Floppy Disks for NetWare and Windows Installation

  You need to use a floppy disk to install the LAN drivers. Use the
MAKEDISK.BAT utility located in the \LAN\Intel55X\MAKEDISK directory
on the CD.

  MAKEDISK [operating system] [destination]

where [operating system] is the OS for which you are creating the
diskette, and [destination] is the drive letter and path (such
as A:). If no destination is specified, the A: drive will be used.

  The possible [operating system] options are:

NT = Microsoft Windows NT
W2K = Microsoft Windows* 2000
W9X = Microsoft Windows* 95 and Windows 98
NW = Novell NetWare servers and clients
DOS = Microsoft DOS and IBM OS2

  Make sure you have a 1.44 MB formatted, non-bootable diskette in the
floppy drive when using this utility.

NOTE: The utility MUST be run from the \LAN\Intel55X \MAKEDISK directory.

  Alternately, you can use the following .BAT files (located
in the root directory on this CD) to simplify this process:

  MAKEW9X.BAT -- Creates a drivers disk for Windows 95 and
                         Windows 98.
  MAKENT.BAT -- Creates a drivers disk for Windows NT.
  MAKEW2K.BAT -- Creates a drivers disk for Windows 2000.
  MAKENW.BAT -- Creates a drivers disk for Novell NetWare
                         servers and clients.

Installing LAN Drivers for Windows 95

Follow these steps to install the Intel 82559 LAN/Ethernet driver for Windows 95:
1. From the **Control Panel**, double-click the **System** icon.
2. Click the **Device Manager** tab.
3. Double-click **Other Devices** (question mark icon) in the list area.
4. Double-click a PCI Ethernet Controller.
5. Click the **Driver** tab, then click **Update Driver**.
6. Insert the Configuration and Drivers disk or CD in the appropriate drive, and at the Update Device Driver Wizard, select "**No**" and click **Next**.
7. Click **Have Disk**, insert the Configuration and Drivers disk in the appropriate drive, and click **OK**.
8. At the Select Device dialog box, click **OK** again.
9. Follow any prompts for Windows 95 installation disks and restart when prompted.

Note: The Windows 95 system files are typically available on the Windows 95 CD in the win95 directory (D:\win95).

Installing LAN Drivers for Windows 98

Follow these steps to install the Intel 82559 LAN/Ethernet driver for Windows 98:
1. From the **Control Panel**, double-click the **System** icon.
2. Click the **Device Manager** tab.
3. Double-click **Other Devices** or Network Adapters in the list area.
4. Double-click a PCI Ethernet Controller.
5. Click the **Driver** tab, then click **Update Driver**.
6. Click **Next** at the Update Device Driver Wizard.
7. Select "**Display a list of all the drivers...**" and click **Next**.
8. Insert the Intel adapter disk and click **Have Disk**.
9. Enter the appropriate drive for your disk media (A:) and click **OK**.
10. Click **OK** at the Select Device dialog box.
11. The Update Wizard displays the message that it has found the driver. click **Next**.
12. Click **Finish**.
13. Restart your computer when prompted.

Installing LAN Drivers for Windows NT

Note: It is recommended that you install the latest Service Pack for Windows NT 4.0, available through Microsoft.

Follow the instructions below to configure it the Ethernet hardware under Windows NT.

1. Double-click the Network icon in the Control Panel.
2. Select the Adapter tab.
3. Click Add. You'll see a list of adapters.
4. Don't select an adapter from this list. Instead, insert the Intel adapter disk or CD into the appropriate drive and click Have Disk.
5. Enter the appropriate drive for your disk media (A:) and click OK. Then follow the prompts to complete installation. When the adapter is added you'll see a new adapter listed in the Network adapters list.
6. Click Close to finish and configure any protocols as prompted.
7. Restart Windows NT when prompted.

5

VGA Drivers Installation

Driver Installation for Windows 95
1. Under the Windows 95 environment, click Start → Settings → Control Panel → Display → Settings → Advanced Properties → Change → Have disk.
2. Enter the path location as "d:\vga\sm721\win95", assuming Drive D: is your CDROM drive. Click OK.
3. Close all tasks and restart the computer for changes to take effect.

Driver Installation for Windows 98SE
1. Under the Windows 98SE environment, click Start → Settings → Control Panel
2. Double click Display → Settings → Advanced → Adapter → Change → Next.
3. Select "Search for a better driver than the one your device is using now. (Recommended)," then click Next.
4. Select "Specify a location."
5. Enter the path location as "d:\vga\sm721\win98," and click Next.
6. Click Next → Finish. Click Yes to restart the computer and for changes to take effect.

Driver Installation for Windows ME
1. Under the Windows ME environment, click Start → Settings → Control Panel → Display → Settings → Advanced.
2. Select "Specify a location."
3. Enter the path location as "d:\vga\sm721\winme", assuming Drive D: is your CDROM drive. Click Next.
4. Select "The update driver (Recommended) Silicon Motion Lynx3DM", then click Next.
5. Click Next → Finish.
6. Click Yes to restart the computer and for changes to take effect.

Driver Installation for Windows 2000
1. Under the Windows 2000 environment, click Start → Settings → Control Panel. Double click System → Hardware → Device Manager → Other devices.
2. Double click "Video Controller (VGA Compatible)."
3. Click Driver → Update Driver → Next.
4. Select "Display a list of the known drivers for this device so that I can choose a specific driver," then click Next.
5. Select "Specify a location," then click Next.
6. Enter the path location as "d:\vga\sm721\win2000," and click OK.
7. Click Next → Finish. Close all tasks and restart the computer for changes to take effect.

Driver Installation for Windows NT 4.0
1. Under the Windows NT environment, click Start → Settings → Control Panel
2. Double click Display → Settings → Type → Change → Have Disk.
3. Enter the path location as "d:\vga\sm721\winnt40," then click OK → OK → Yes → OK.
4. Close all tasks and restart the computer for changes to take effect.

6

Audio Drivers Installation

This chapter describes the VIA 686A audio driver installation process for Windows 98SE and Windows NT. Follow the installation steps below to finish the audio driver installation.

**Windows 98SE Audio Driver Installation**

1. Insert the driver CD disc to the CD-ROM drive. The CD-ROM autoruns and displays the selections available. Click on **VIA Chips Driver** and the following window appears. Click **VIA 686A PCI Multimedia Audio Driver**.

2. When the **Welcome** screen appears, click **Next** to proceed with the audio driver installation.

3. The **Select Components** window will appear. Click **Next** to install the audio driver.
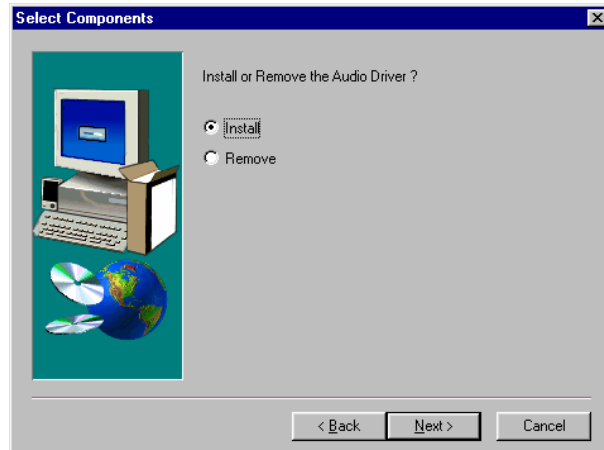
4. After the necessary files are copied, click **Finish**.

5. When Windows restarts, the new hardware wizard window will appear. The wizard searches for the drivers for VIA PCI Audio Controller (WDM). Click **Next** to continue.

6. In the next window, select **Search for the best driver for your device (Recommended).** Click **Next**.

7. Now, select **Specify a location,** then key in location path as **d:\via\via686A\win98\win98se**, assuming that D: is your CDROM drive and the driver CD is in the CDROM. Now, click **Next → Next**.

8. When prompted to insert the Windows 98SE CD, do so accordingly and click **OK**. When the screen appears with a message **can't find viaudio.dat**, insert the driver CD into the CDROM and key in the file path as **d:\via\via686a\win98\win98se** and click **Finish**.

9. Restart your computer when prompted for changes to take effect.

Windows NT 4.0 Audio Driver Installation
IMPORTANT: You should install the Windows NT 4.0 Service Pack 4 or higher first before installing the VIA 686A PCI multimedia audio device drivers. If you don't have Windows NT 4.0 Service Pack 4 or higher, please contact your software vendor or download it from Microsoft's web site.

1. Insert the driver CD disc to the CD-ROM drive. The CD-ROM autoruns and displays the selections available. Click on **VIA M/B Drivers** and the following window appears. Click **VIA 686A PCI Multimedia Audio Driver**.

2. When the **Welcome** screen appears, click **Next** to proceed with the audio driver installation.

3. The **Select Components** window will appear. Click **Next** to install the audio driver.

4. When the **Information** window appears, click **OK**. Please choose "**Add…**" from the next window and add the following device: VIA PCI Audio Controller and VIA MIDI External Port.
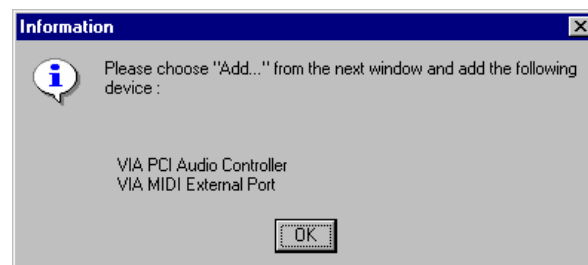
5. After the VIA PCI Audio Controller and VIA MIDI External Port devices are added, you will be asked whether to install the driver for the Microsoft Sidewinder 3D Pro Joystick. Click **No.**
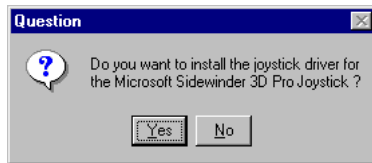
Appendix

A. Post Codes
B. Interrupt Request Lines (IRQ)

A. POST Codes

POST (Power On Self Test) codes are to determine problems during boot up. Below are the codes for your reference.

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
01h	Expand the Xgroup codes locating in physical address 1000:0
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
16h	Initial Early_Init_Onboard_Generator switch.
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).

POST (hex)	Description
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Dh	Initial EARLY_PM_INIT switch.
1Fh	Load keyboard matrix (notebook platform)
21h	HPM initialization (notebook platform)
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
27h	Initialize INT 09 buffer
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
2Dh	1. Initialize multi-language 2. Put information on screen display, including Award title, CPU type, CPU speed ….
33h	Reset keyboard except Winbond 977 series Super I/O chips.
3Ch	Test 8254
3Eh	Test 8259 interrupt mask bits for channel 1.
40h	Test 8259 interrupt mask bits for channel 2.
43h	Test 8259 functionality.
47h	Initialize EISA slot
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.

POST (hex)	Description
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
50h	Initialize USB
52h	Test all memory (clear all extended memory to 0)
55h	Display number of processors (multi-processor platform)
57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
59h	Initialize the combined Trend Anti-Virus code.
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onbaord_AUDIO switch.
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
65h	Initialize PS/2 Mouse
67h	Prepare memory size information for function call: INT 15h ax=E820h
69h	Turn on L2 cache
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.

73h	(Optional Feature)
	Enter AWDFLASH.EXE if :
	     -AWDFLASH is found in floppy drive.
	     -ALT+F2 is pressed

75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
77h	Detect serial ports & parallel ports.
7Ah	Detect & install co-processor

POST (hex)	Description

7Fh	1. Switch back to text mode if full screen logo is supported.
	  -If errors occur, report errors & wait for keys
	  -If no errors occur or F1 key is pressed to continue:
	    ◆Clear EPA or customization logo.

82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program boot up speed 3. Chipset final initialization. 4. Power management final initialization 5. Clear screen & display summary table 6. Program K6 write allocation 7. Program P6 class write combining
95h	1. Program daylight saving 2. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

B. Interrupt Request Lines (IRQ)

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

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Serial Port #4
IRQ10	Serial Port #3
IRQ11	Reserved
IRQ12	Reserved
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE