

IB710

Socket 370 Little Board
With VGA/Audio/LAN

USER'S MANUAL

Version 1.0B

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Introduction

Product Description

The IB710 little board is a high-performance multimedia Little Board based on the Intel 440BX AGPset. It features a Socket 370 architecture that supports Intel Celeron and Coppermine processors using 66MHz and 100MHz front side bus respectively.

The IB710 packs all the functions of a versatile system, including VGA, Audio, Ethernet and Hardware Monitoring features, into the Little Board form factor. System memory is provided by one DIMM socket that accommodates up to 256MB SDRAM.

The Award BIOS facilitates easy system configuration and peripheral setup. Other advanced features include *DiskOnChip flash disk* support, watchdog timer, *PC/104*, USB and IrDA interface.

DiskOnChip flash disks are storage devices that has no moving parts and emulates FDD/HDD with Flash/RAM/ROM offering reliable data/program storage and long life span. They are reliable and suitable for industrial or other harsh environments characterized by motion, shock, vibration, adverse temperature, dust and humidity. Other features include faster data access, longer MTBF, lower power consumption, cost effective for small capacity and small form factor.

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

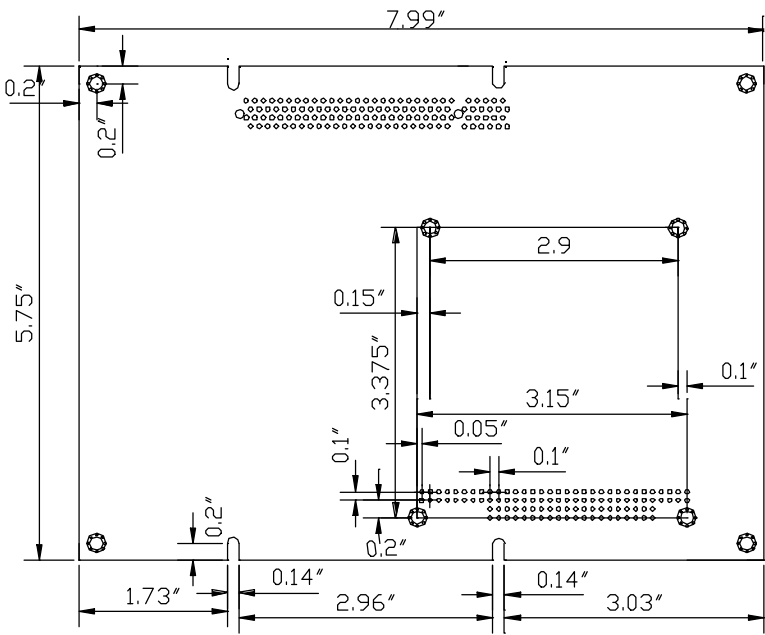
Your IB710 package should include the items listed below. Damaged or missing items should be reported to your supplier.

- The IB710 Embedded Little Board
- This User's Manual
- One compact disc containing the following:
 - Intel PCI IDE Driver and Flash Memory Utility
 - CHIPS C&T 69000 VGA Driver
 - Realtek RTL8139 Ethernet Drivers
 - ESS Solo-1 ES1938S Audio Drivers
- Optional cables such as:
 - 1 Floppy Ribbon Cable
 - 1 Audio Cable
 - 1 44-pin IDE Ribbon Cable
 - 1 COM Port Cable
 - 1 Printer Port Cable
 - 1 PS/2 Keyboard/Mouse Cable
 - 1 VGA Cable
 - 1 RJ45 LAN Cable

Specifications

Processor Supported	Socket 370 support Intel Celeron / Coppermine, 300MHz~800MHz, 66MHz/100MHz Bus Speed
Chipset	Intel 440BX AGPset
BIOS	Award BIOS Supports ACPI, DMI, PnP
System Memory	1x DIMM socket support up to 256MB capacity 3.3V supported ECC supported
Multi I/O Chipset	Winbond 83977TF and 83877TF (keyboard controller is built-in 83977TF)
I/O Features	1x FDD (up to 2.88MB, 3 Mode, LS120) 1x Parallel Port (EPP, ECP Port) 4x Serial Ports (3x RS232, 1x RS232/422/485) 1x IrDA TX/RX Headers
Bus Master IDE	2x IDE interfaces for up to 4 devices; supports PIO Mode 3/4 or Ultra DMA/33 IDE HDD, and ATAPI CD-ROM
On-board VGA	CHIPS 69000 PCI VGA Accelerator Support CRT & LCD Panels 15-pin VGA connector 1024x768(High Color) resolution 2MB integrated memory PC97 and PC98 Compatible
On-board Audio	ESS Solo-1 (ESS1938S) PCI Single Audio Chip Provides high-quality audio processing
On-board Ethernet	Realtek RTL8139 Single-Chip Controller 32-bit performance, PCI bus master capability Supports 10/100Mbps data transfer rates
Hardware Monitoring	Winbond W83781D IC Monitors CPU/system temperature and voltages
SSD Interface	Support M-Systems 2MB~144MB DiskOnChip flash disk
Watchdog Timer	16 levels
Form Factor	Little Board
Dimensions	203mm x 146mm (7.99" x 5.75")

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the IB710 in order to set up a workable system. The topics covered are:

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Installing the CPU

The IB710 Embedded Little Board supports a Socket 370 processor socket for Intel Celeron/Coppermine processors.

The Socket 370 processor socket comes with a lever to secure the processor. Raise this lever to about a 90° angle to allow the insertion of the processor. Place the processor into the socket by making sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket. Once the processor has slid into the socket, return the lever to the lock position.

After you have installed the processor into the socket, check if the jumpers for the CPU type and speed are correct.

NOTE: *Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.*

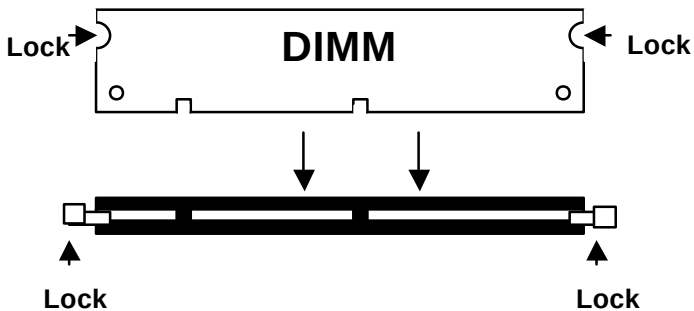
Installing the Memory (DIMM)

The IB710 Embedded Little Board supports one 168-pin DIMM socket for a maximum total memory of 256MB in SDRAM type. The memory capacities supported are 32MB, 64MB, 128MB and 256MB.

Installing and Removing DIMMs

To install the DIMM, locate the memory slot on the little board and perform the following steps:

1. Hold the DIMM so that the two keys of the DIMM align with those on the memory slot.
2. Gently push the DIMM in an upright position until the clips of the slot close to hold the DIMM in place when the DIMM touches the bottom of the slot.
3. To remove the DIMM, press the clips with both hands.



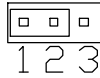
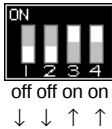
Top View of DIMM Socket

Setting the Jumpers

Jumpers are used on the IB710 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 IB710 and their respective functions.

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The following conventions are used in this section:



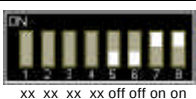
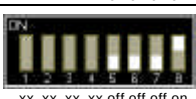
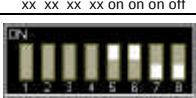
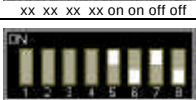
Pin 1-2
Short/Closed

SW1(3): CPU Bus Speed Selector

Bus Speed	SW1(3)	Switch Setting
100MHz		off
66MHz		on

SW1(5-8): CPU Frequency Selector

The table below shows the correct setting to match the CPU frequency.

Frequency Multiplier	CPU Frequency (66MHz)	CPU Frequency (100MHz)	SW1(5-8)
4.5X	300MHz	450MHz	 xx xx xx xx off on off on
5X	333MHz	500MHz	 xx xx xx xx off on off on
5.5X	366MHz	550MHz	 xx xx xx xx off off off on
6X	400MHz	600MHz	 xx xx xx xx on on on off
6.5X	433MHz	650MHz	 xx xx xx xx on on on off
7X	466MHz	700MHz	 xx xx xx xx on on on off
7.5X	500MHz	750MHz	 xx xx xx xx on off off off
8X	533MHz	800MHz	 xx xx xx xx on on off off

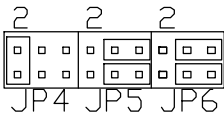
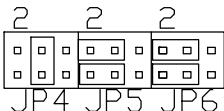
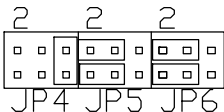
JP2: LCD Power Setting

JP2	Setting	Function
	Pin 1-2 Short/Closed	3.3V
	Pin 2-3 Short/Closed	5V

JP3: ATX Function Selection

JP3	Setting	Function
	Pin 1-2 Short/Closed	ATX Function
	Pin 2-3 Short/Closed	Normal

JP4, JP5, JP6: RS232/RS422/RS485 (COM2) Selection

JP4, JP5, JP6	Pin Short	Function
	JP4: 1-2 JP5: 3-5, 4-6 JP6: 3-5, 4-6	RS232
	JP4: 3-4 JP5: 1-3, 2-4 JP6: 1-3, 2-4	RS422
	JP4: 5-6 JP5: 1-3, 2-4 JP6: 1-3, 2-4	RS485

JP7: COM3/4 RS232 +5V / +12V Power Setting

JP7 Pin #	Signal Name	JP7	Signal Name	JP7 Pin #
1	+5V		+5V	2
3	Pin 9 (COM3)		Pin 9 (COM4)	4
5	+12V		+12V	6

COM3 Settings: Pin 1-3 short = +5V, Pin 3-5 short = +12V

COM4 Settings: Pin 2-4 short = +5V, Pin 4-6 short = +12V

JP11: Onboard LAN Enable/Disable

JP11	Setting	LAN Function
	Short/Closed	Enabled
	Open	Disabled

JP12: DiskOnChip Address Select

JP12	Setting	Address
	Pin 1-2 Short/Closed	D0000-D7FF
	Pin 2-3 Short/Closed	D8000-DFFF

JP13: Clear CMOS Content

JP13	Setting	Function
	Pin 1-2 Short/Closed	Normal Operation
	Pin 2-3 Short/Closed	Clear CMOS Content

JP14: COM1/2 RS232 +5V / +12V Power Setting

JP14 Pin #	Signal Name	JP14	Signal Name	JP14 Pin #
1	+5V		+5V	2
3	Pin 9 (COM1)		Pin 9 (COM2)	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, JP10, J9, J19: Manufacturer Testing Use

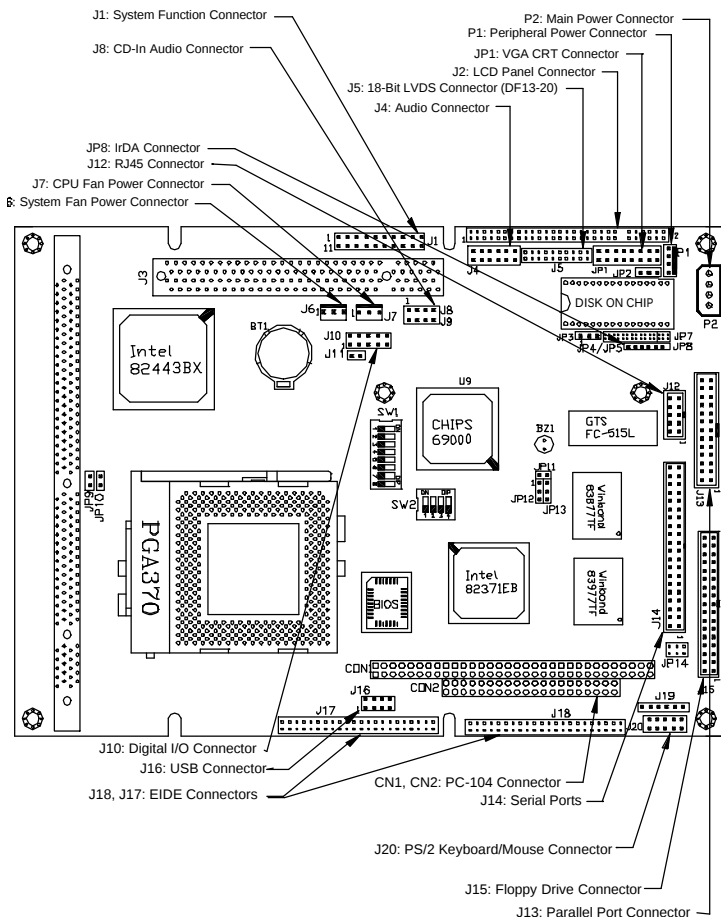
JP9, JP10, J9, and J19 are jumpers and connectors that have no definition in this manual and are used for manufacturer testing purposes.

Connectors on IB710

The connectors on IB710 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on IB710 and their respective functions.

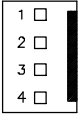
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Connector Locations on IB710



P1: Peripheral Power Connector

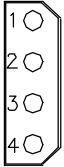
The P1 peripheral power connector has the following pin assignments.



Pin #	Signal Name
1	-12V
2	Ground
3	-5V
4	Ground

P2: Main Power Connector

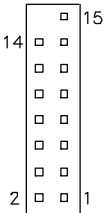
The P2 main power connector has the following pin assignments.



Pin #	Signal Name
1	+5V
2	Ground
3	Ground
4	+12V

JP1: VGA CRT Connector

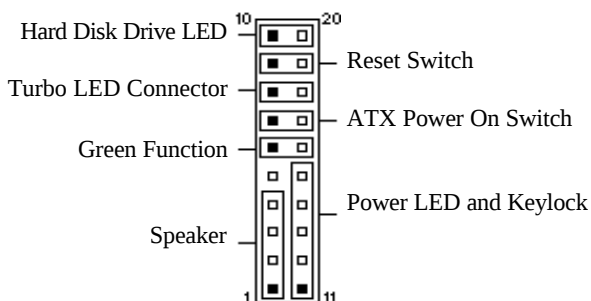
JP1 is a 15-pin header for an external VGA CRT female connector.



Signal Name	Pin	Pin	Signal Name
Red	1	2	Vcc
Green	3	4	Ground
Blue	5	6	N.C.
N.C.	7	8	N.C.
Ground	9	10	H-Sync
Ground	11	12	V-Sync
Ground	13	14	N.C.
Ground	15	16	N.C.

J1: System Function Connector

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



Speaker: Pins 1 - 4

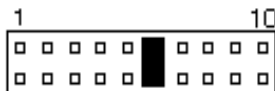
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.



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

Green Function: Pins 6 and 16

This connector is for the “Green Switch” on the control panel, which, when pressed, will force the system immediately into the power saving (sleep) mode.



Pin #	Signal Name
6	Sleep
16	Ground

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 and Keylock: Pins 11 - 15

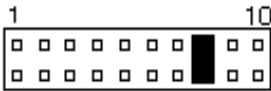
The power LED indicates the status of the main power switch. The keylock switch, when closed, will disable the keyboard function.



Pin #	Signal Name
11	Power LED
12	No connect
13	Ground
14	Keylock
15	Ground

Turbo LED Connector: Pins 8 and 18

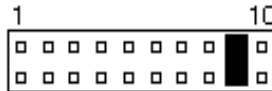
There is the no turbo/deturbo function on the embedded board. The Turbo LED on the control panel will always be on when attached to this connector.



Pin #	Signal Name
8	5V
18	Ground

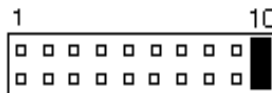
Reset Switch: Pins 9 and 19

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.

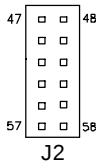


J2: LCD Panel Connector

J2 is the pin header for flat panel LCD displays. The following shows the pin assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
Ground	3	4	Ground
5V/3.3V	5	6	5V/3.3V
ENAVEE	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	FLM
MDE	37	38	LP
Ground	39	40	ENABKL
Ground	41	42	LCDVDD
DNAVDD	43	44	5V/3.3V



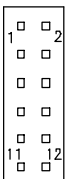
Signal Name	Pin #	Pin #	Signal Name
P24	1	2	P25
P26	3	4	P27
P28	5	6	P29
P30	7	8	P31
P32	9	10	P33
P34	11	12	P35

Flat Panel Display Interface Pin Descriptions

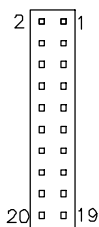
	Mono	Mono	Mono	Color	Color	Color	Color	Color	Color	Color	Color	Color
	SS	DD	DD	TFT	TFT	TFT	TFT	TFT+HR	STN-SS	STN-SS	STN-DD	STN-DD
Pin Name	8-bit	8-bit	16-bit	9/12/16 bit	18/24 bit	36-bit	18/24 bit	8-bit (4bP)	16-bit (4bP)	8-bit (4bP)	16-bit (4bP)	24-bit
P0	D0	UD3	UD7	B0	B0	FB0	FB0	R1	R1	UR1	UR0	UR0
P1	D1	UD2	UD6	B1	B1	FB1	FB1	G1	G1	UG1	UG0	UG0
P2	D2	UD1	UD5	B2	B2	FB2	FB2	B1	B1	UB1	UB0	UB0
P3	D3	UD0	UD4	B3	B3	FB3	FB3	B3	B3	UB2	UB1	UB1
P4	D4	LD3	UD3	B4	B4	FB4	SB0	G4	G3	LR1	LR0	LG0
P5	D5	LD2	UD2	G0	B5	FB5	SB1	R5	B2	LG1	LG0	LB0
P6	D6	LD1	UD1	G1	B6	SB0	SB2	B5	R3	LB1	LB0	UR1
P7	D7	LD0	UD0	G2	B7	SB1	B3		G3	LR2	LR1	UG1
P8			LD7	G3	G0	SB2	FG0		B3		UG1	UB1
P9			LD6	G4	G1	SB3	FG1		R4		UB1	LR1
P10			LD5	G5	G2	SB4	FG2		G4		UR2	LG1
P11			LD4	R0	G3	SB5	FG3		B4		UG2	LB1
P12			LD3	R1	G4	FG0	SG0		R5		LG1	UR2
P13			LD2	R2	G5	FG1	SG1		G5		LB1	UG2
P14			LD1	R3	G6	FG2	SG2		B5		LR2	UB2
P15			LD0	R4	G7	FG3	SG3		G6		LG2	LR2
P16					R0	FG4	FR0					LG2
P17					R1	FG5	FR1					LB2
P18					R2	SG0	FR2					UR3
P19					R3	SG1	FR3					UG3
P20					R4	SG2	SR0					LR3
P21					R5	SG3	SR1					LG3
P22					R6	SG4	SR2					LB3
P23					R7	SG5	SR3					
P24						FR0						
P25						FR1						
P26						FR2						
P27						FR3						
P28						FR4						
P29						FR5						
P30						SR0						
P31						SR1						
P32						SR2						
P33						SR3						
P34						SR4						
P35						SR5						
SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK	SHFCLK
Pixels/Clk:	8	8	16	1	1	2	2	2-2/3	5-1/3	2-2/3	5-1/3	8

J4: Audio Connector

J4, a 12-pin header connector, supports an optional external connector supporting 3 sockets for Line Out, Line In and Mic functions. The following table shows the pin assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line Out R	1	2	Line Out L
Ground	3	4	Ground
Line In R	5	6	Line In R
Ground	7	8	Ground
Mic	9	10	BIAS
Ground	11	12	NC

J5: 18-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
NC	10	9	NC
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

J6: System Fan Power Connector

J6 is a 3-pin header for a CPU fan. The fan must be a 12V fan.



Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

J7: CPU Fan Power Connector

J7 is a 3-pin header for a CPU fan. The fan must be a 12V fan.



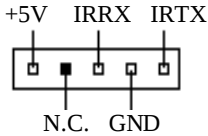
Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

J8: CD-In Audio Connector

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

JP8: IrDA Connector

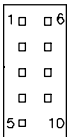
This connector is used for an IrDA connector for wireless communication.



Pin #	Signal Name
1	+5V
2	No Connect
3	Ir RX
4	Ground
5	Ir TX

J10: Digital I/O Connector

This 10-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
DI0	1	6	Vcc
DI1	2	7	DO0
No Connect	3	8	Ground
No Connect	4	9	DO1
Ground	5	10	+12V

SPECIFICATIONS:

Digital Input

Input channels: 2 bits

Input Voltage: High: 2.0V (min)
Low: 0.8V (max)

Input Load: High: 0.05mA max at 2.7V
Low: 0.4mA max at 0.5V

Register Address: 240H

Register Format: BIT: D1 D0
Value: DI1 DI0

Digital Output

Output channels: 2 bits

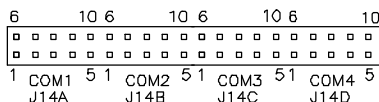
Output voltage: High: Source -0.4mA at 2.4V min
Low: Sink 8mA at 0.5V max

Register Address: 240H (Write)

Register Format: BIT: D1 D0
Value: DO1 DO0

J14: Serial Ports

J14A (COM1), J14B (COM2), J14C (COM3) and J14D (COM4/TTL level) are the onboard serial ports on the IB710.



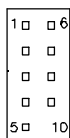
Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

J14B (COM2) is jumper selectable for RS-232, RS-422 and RS-485.

Pin #	Signal Name		
	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

J12: RJ45 Connector

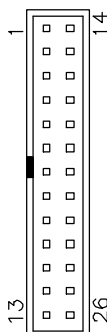
J12, an RJ45 connector, is for the external LAN connector. The IB710 supports both 10Mbps and 100Mbps LAN facilities.



Signal Name	Pin #	Pin #	Signal Name
LED1+	1	6	LED1-
RX+	2	7	RX-
LED2-	3	8	Ground
LED2+	4	9	Ground
TX+	5	10	TX-

J13: Parallel Port Connector

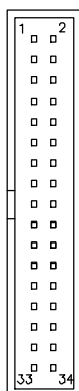
The following table describes the pin out assignments of this connector.



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

J15: Floppy Drive Connector

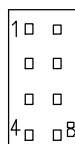
J15 of the IB710 is a 34-pin header and will support up to 2.88MB floppy drives.



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

J16: USB Connector

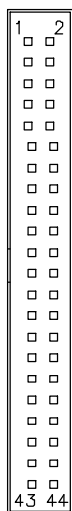
J16 is the onboard USB pin-header that supports an external USB connector with two ports.



Pin #	Signal Name
1	5 Vcc
2	6 USB-
3	7 USB+
4	8 Ground

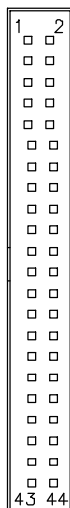
J18, J17: EIDE Connectors

J18 is the *primary* IDE connector. J17 is the *secondary* IDE connector.



J18: IDE1

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	Key
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
Vcc	41	42	Vcc
Ground	43	44	N.C.

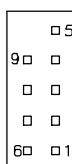


J17: IDE2

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	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK1	29	30	Ground
MIRQ0	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
Vcc	41	42	Vcc
Ground	43	44	N.C.

J20: PS/2 Keyboard/Mouse Connector

J20, a 10-pin header connector, has functions for both keyboard and mouse. The following table shows the pin assignments of this connector.

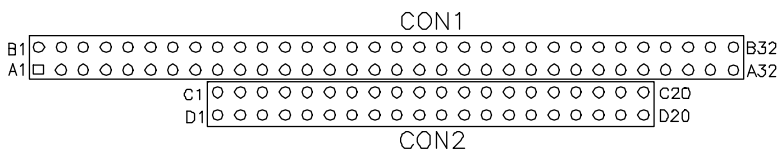


Signal Name	Pin #	Pin #	Signal Name
N.C.	10	5	N.C.
KB clock	9	4	Mouse clock
KB data	8	3	Mouse data
Vcc	7	2	Vcc
Ground	6	1	Ground

CON1, CON2: PC-104 Connector

CON1 and CON2 are dual-in-line pin headers that support PC-104 modules. CON1 consists of 64 pins and CON2 has 40 pins. The following table shows the their pin assignments.

CON1				CON2			
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	GND	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	F	0	9	7	16
2	E	2	10	6	18
3	D	4	11	5	20
4	C	6	12	4	22
5	B	8	13	3	24
6	A	10	14	2	26
7	9	12	15	1	28
8	8	14	16	0	30

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BIOS Setup

This section describes the different settings available in the Award BIOS that comes with the IB710 embedded board. The topics covered in this section are as follows:

BIOS Introduction	32
BIOS Setup.....	32
Standard CMOS Setup.....	34
BIOS Features Setup	37
Chipset Features Setup.....	40
Power Management Setup.....	43
PNP/PCI Configuration	46
Load BIOS Defaults	48
Load Setup Defaults	48
Integrated Peripherals	50
Supervisor / User Password.....	52
IDE HDD Auto Detection.....	53
Save & Exit Setup.....	53
Exit Without Saving	53

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 key immediately allows you to enter the Setup utility. If you are a little bit late pressing the 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 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.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP/PCI CONFIGURATION LOAD BIOS DEFAULTS LOAD SETUP DEFAULTS	INTEGRATED PERIPHERALS SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION SAVE & EXIT SETUP EXIT WITHOUT SAVING
ESC : Quit F10 : Save & Exit Setup F6 : Save CMOS to BIOS	↑ ↓ → ← : Select Item (Shift) F2 : Change Color F7 : Load CMOS From BIOS
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 Embedded Little Board 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.

ROM PCI/ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Thu, May 18 2000								
Time (hh:mm:ss) : 00 : 00 : 00								
HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	Auto	0	0	0	0	0	0	Auto
Primary Slave	Auto	0	0	0	0	0	0	Auto
Secondary Master	Auto	0	0	0	0	0	0	Auto
Secondary Slave	Auto	0	0	0	0	0	0	Auto
Drive A	: 1.44M, 3.5in				Base Memory		: 640K	
Drive B	: None				Extended Memory		: 15360K	
					Other Memory		: 384K	
Video	: EGA / VGA				Total Memory		: 16384K	
Halt On	: All Errors							
ESC : Quit			↑ ↓ → ← : Select			Item PU / PD / + / - : Modify		
F1 : Help			(Shift) F2 : Change Color					

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.

ROM / PCI ISA BIOS
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
CPU L2 Cache ECC Checking	: Enabled	D0000-D3FFF Shadow	: Disabled
Processor Number Feature	: Enabled	D4000-D7FFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D8000-DBFFF Shadow	: Disabled
Boot Sequence	: A, C, SCSI	DC000-DFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled		
Boot Up Floppy Seek	: Enabled		
Boot Up Numlock Status	: On		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup	ESC : Quit	↑ ↓ → ← : Select Item
PCI /VGA Palette Snoop	: Disabled	F1 : Help	PU/PD/+/- : Modify
OS Select For	: Non-OS2	F5 : Old Values	(Shift) F2 : Color
DRAM>64MB		F6 : Load BIOS Defaults	
Report No FDD For WIN 95	: Yes	F7 : Load Setup Defaults	

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 / External Cache

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

CPU L2 Cache ECC Checking

Setting this option to **Enabled** to enable the ECC (error correction code) checking on the CPU L2 cache.

Processor Number Feature

When this field is enabled, the system would detect and display the processor ID during system boot up.

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.

Boot Sequence

This field determines the drive that the system searches first for an operating system. The options are:

A, C, SCSI (default)	D, A, SCSI	SCSI, C, A	CDROM, C, A
C, A, SCSI	E, A, SCSI	C only	SCSI, A, C
C, CDROM, A	F, A, SCSI	LS120, C	

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.

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*.

Gate A20 Option

This field allows you to select how Gate A20 is worked. The Gate A20 is a device used to address memory above 1 MB. By default, this field is set to *Fast*.

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.

PCI/VGA Palette Snoop

Some display cards that are non-standard VGA may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA Cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

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.

Chipset Features Setup

This menu controls the configuration of the embedded board chipset.

ROM PCI/ISA BIOS
CHIPSET FEATURES SETUP
AWARD SOFTWARE INC.

Auto Configuration	: Enabled	Auto Detect DIMM/PCI Clk	: Disabled
SDRAM RAS-to-CAS Delay	: 3	Spread Spectrum	: Disabled
SDRAM RAS Precharge Time	: 3	CPU Host Clock (CPU/PCI)	: Default
SDRAM CAS Latency Timer	: 3	CPU Warning Temperature	: 66°C/151°F
SDRAM Precharge Control	: Disabled	Current System Temp.	: 40°C/104°F
DRAM Data Integrity Mode	: Non-ECC	Current CPU/Chip Temperature	: 41°C/105°F
System BIOS Cacheable	: Enabled	Current CPU/Block Temp.	: 41°C/105°F
Video BIOS Cacheable	: Enabled	CPU Fan Speed	: 4440 RPM
Video RAM Cacheable	: Enabled	Chassis Fan Speed	: 0 RPM
8 Bit I/O Recovery Time	: 3	VCCP 1.98 V VTT (V)	: 1.50 V
16 Bit I/O Recovery Time	: 2	VCC3 (V): 3.45 V + 5 V	: 4.99 V
Memory Hole At 15MB-16MB	: Disabled	+12 V : 12.46 V	
Passive Release	: Enabled		
Delayed Transaction	: Disabled		
AGP Aperture Size (MB)	: 64		
		ESC : Quit	↑ ↓ → ← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Auto Configuration

This field predefines values for DRAM, cache timing according to CPU type and system clock. When this field is enabled, the predefined items will become read-only.

SDRAM RAS-to-CAS Delay

When DRAM is refreshed, both rows and columns are addressed separately. This field allows you to determine the timing of transition from Row Address Strobe (RAS) to Column Address Strobe (CAS).

SDRAM RAS Precharge Time

The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.

SDRAM CAS Latency Time

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

SDRAM Precharge Control

This field enables or disables the SDRAM Precharge Control.

DRAM Data Integrity Mode

Set this field to *ECC* if the DRAM installed in the system supports it. Otherwise, do not reset the default of *Non-ECC*.

System BIOS Cacheable

When enabled, access to the system BIOS ROM addressed at F0000H-FFFFFH is cached, provided that the cache controller is disabled.

Video BIOS Cacheable

When enabled, access to video BIOS addressed at C0000H to C7FFFH is cached, provided that the cache controller is disabled.

Video RAM Cacheable

Selecting *Enabled* allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result.

8 Bit I/O Recovery Time

This option specifies the length of the delay (in sysclks) inserted between consecutive 8-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7, or 8. The default setting is 3.

16 Bit I/O Recovery Time

This option specifies the length of the delay (in sysclks) inserted between consecutive 16-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7, or 8. The default setting is 2.

Memory Hole at 15MB - 16MB

In order to improve performance, certain space in memory can be reserved for ISA cards. This field allows you to reserve 15MB to 16MB memory address space to ISA expansion cards. This makes memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. By default, this field is set to *Disabled*.

Passive Release

When enabled, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1. The default setting is *Enabled*.

AGP Aperture Size

The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is *64M*.

Auto Detect DIMM/PCI Clk

When enabled, the system automatically shuts off clocks of unused DIMM/PCI slots. The default setting is *Disabled*.

Spread Spectrum

This value of the spread spectrum, when not disabled, can be set to 0.25% and 0.5%. This field is for CE testing use only.

CPU Host Clock (CPU/PCI)

This field sets the value of the CPU Host Clock (CPU/PCI). The default setting of *Default* automatically detects the host clock (front side bus) of the processor. Other options include *100/33*, *103/34*, *112/37*, *124/41*, *133/44*, *124/31*, *133/33*, *140/35*, *150/37*, *66/33*, *75/37*, and *83/41*.

Note that overclocking can cause your system to become unstable.

CPU Warning Temperature

This field sets the threshold temperature at which an alert is sounded through the system's speaker when the value has been reached.

Current System/CPU/Chips/CPU Block Temperature

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

CPU Fan Speed/Chassis Fan Speed

These read-only fields show the current speeds in RPM for the CPU/chassis fan as monitored by the hardware monitoring IC.

VCCP / VTT / VCC3 / +12V / +5V

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

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.

ROM PCI/ISA BIOS
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: User Define	** Reload Global Timer Events **	
PM Control by APM	: Yes	IRQ3 (3-7, 9-15), NMI	: Disabled
Video Off Method	: V/H Sync+Blank	Primary IDE 0	: Disabled
Video Off After	: Standby	Primary IDE 1	: Disabled
Modem Use IRQ	: 3	Secondary IDE 0	: Disabled
Doze Mode	: Disabled	Secondary IDE 1	: Disabled
Standby Mode	: Disabled	Floppy Disk	: Disabled
Suspend Mode	: Disabled	Serial Port	: Enabled
HDD Power Down	: Disabled	Parallel Port	: Disabled
Throttle Duty Cycle	: 62.5%		
PCI/VGA Active Monitor	: Disabled		
Power On by Ring	: Disabled		
Resume by Ring	: Disabled		
Date (of Month) Alarm	: 0		
Time (hh:mm:ss) Alarm	: 7:0:0		
IRQ 8 Break Suspend	: Disabled	ESC : Quit	↑ ↓ → ← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

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	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min. (Default)

NOTE: In order to enable the CPU overheat protection feature, the Power Management field should not be set to Disabled.

PM Control by APM

This field allows you to use the Advanced Power Management device to enhance the Max. Power Saving mode and stop the CPU's internal clock. If the Max. Power Saving is not enabled, this will be preset to NO.

Video Off Method

This field defines the Video Off features. There are three options.

V/H SYNC + Blank (default): blank the screen and turn off vertical and horizontal scanning.

DPMS: allows the BIOS to control the video display card if it supports the DPMS feature.

Blank Screen: This option only writes blanks to the video buffer.

Video Off After

As the system moves from lesser to greater power-saving modes, select the mode in which you want the monitor to blank.

Modem Use IRQ

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

Doze Mode

When enabled, and after the set time of system inactivity, the CPU clock will run at a slower speed while all other devices still operate at full speed.

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.

Suspend Mode

When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

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.

Throttle Duty Cycle

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

PCI/VGA Act-Monitor

When enabled, any video activity restarts the global timer for Standby mode. The default setting is **Disabled**.

PowerOn by Ring

When enabled, the system can be powered on through the external modem connected.

IRQ 8 Break Suspend

You can enable or disable the monitoring of IRQ 8 (Real Time Clock) so it does not awaken the system from Suspend mode.

Resume by Alarm

With the use of ATX power, the system can be powered on through this field by setting the specific time for it to do so.

Reload Global Timer Events

This section determines the reloading of the ‘timers’ after entering the Full On You can enable or disable the monitoring of IRQ 8 (Real Time Clock) so it does not awaken the system from Suspend mode.

PM Events

The VGA, LPT & COM, HDD & FDD, DMA /master, PWR-On by Modem/LAN, RTC Alarm Resume and Primary INTR section 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. The default value is **Off**. When set On, activity will neither prevent the system from going into a power management mode nor awaken it. The IRQ section sets the wake-up call of the system. If activity is detected from any enabled IRQ channels in the left-hand group, the system wakes up from suspended mode.

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.

ROM PCI/ISA BIOS
PNP/PCI CONFIGURATION
AWARD SOFTWARE INC.

PNP OS Installed	: No	Used MEM base addr	: N/A
Resources Controlled by	: Manual	Use MEM Length	: 8K
Reset Configuration Data	: Disabled		
IRQ-3 assigned to	: Legacy ISA		
IRQ-4 assigned to	: Legacy ISA		
IRQ-5 assigned to	: Legacy ISA		
IRQ-7 assigned to	: Legacy ISA		
IRQ-9 assigned to	: Legacy ISA		
IRQ-10 assigned to	: Legacy ISA		
IRQ-11 assigned to	: PCI/ISA PnP		
IRQ-12 assigned to	: PCI/ISA PnP		
IRQ-14 assigned to	: PCI/ISA PnP		
IRQ-15 assigned to	: PCI/ISA PnP		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: Legacy ISA	ESC : Quit	↑ ↓ ← : Select Item
DMA-3 assigned to	: PCI/ISA PnP	F1 : Help	PU/PD/+/- : Modify
DMA-5 assigned to	: PCI/ISA PnP	F5 : Old Values	(Shift) F2 : Color
DMA-6 assigned to	: PCI/ISA PnP	F6 : Load BIOS Defaults	
DMA-7 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults	

PNP OS Installed

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

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 assigns them. The options: Auto and Manual.

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.

IRQ3/4/5/7/9/10/11/12/14/15, DMA0/1/3/5/6/7 assigned to

These fields allow you to determine the IRQ/DMA assigned to the ISA bus and is not available to any PCI slot.

Used MEM base addr

Select a base address for the memory area used by any peripheral that requires high memory. The options: C800, CC00, D000, D400, D800, DC00, N/A.

Used MEM Length

Select a length for the memory area specified in the previous field. This field does not appear if no base address is specified. The options: 8K, 16K, 32K, 64K.

Load BIOS 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.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE CHS DETECTION
PNP/PCI CONFIGURATION	SCSI/BIOS SETUP
LOAD BIOS DEFAULTS	LOAD SETUP DEFAULTS
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
F6 : Save CMOS to BIOS	F7 : Load CMOS From BIOS
Load BIOS Defaults except Standard CMOS Setup	

To load BIOS defaults value to CMOS SRAM, enter “Y”. If not, enter “N”.

Load Setup 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.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE CHS DETECTION
PNP/PCI CONFIGURATION	SCSI/BIOS SETUP
LOAD BIOS DEFAULTS	LOAD SETUP DEFAULTS
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
F6 : Save CMOS to BIOS	F7 : Load CMOS From BIOS
Load BIOS Defaults except Standard CMOS Setup	

To load SETUP defaults value to CMOS SRAM, enter “Y”. If not, enter “N”.

Integrated Peripherals

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

ROM PCI/ISA BIOS
INTEGRATED PERIPHERALS
AWARD SOFTWARE INC.

IDE HDD Block Mode	: Enabled	Onboard FDC Controller	: Enabled
IDE Primary Master PIO	: Auto	Onboard Serial Port 1	: 3F8 / IRQ4
IDE Primary Slave PIO	: Auto	Onboard Serial Port 2	: 2F8 / IRQ3
IDE Secondary Master PIO	: Auto	UART Mode Select	: Normal
IDE Secondary Slave PIO	: Auto		
IDE Primary Master UDMA	: Auto	Onboard Parallel Port	: 378H/IRQ7
IDE Primary Slave UDMA	: Auto	Parallel Port Mode	: SPP
IDE Secondary Master UDMA	: Auto		
IDE Secondary Slave UDMA	: Auto		
On-Chip Primary PCI IDE	: Enabled	Onboard Serial Port 3	: 3E8H
On-Chip Secondary PCI IDE	: Enabled	Serial Port 3 Use IRQ	: IRQ9
USB Keyboard Support	: Disabled	Onboard Serial Port 4	: 2E8H
Init Display First	: PCI Slot	Serial Port 4 Use IRQ	: IRQ10
		ESC : Quit ↑ ↓ ← : Select Item	
		F1 : Help PU/PD/+/- : Modify	
		F5 : Old Values (Shift) F2 : Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

IDE HDD Block Mode

This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

IDE Primary Master/Slave PIO And 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 And 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.

USB Keyboard Support

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

Init Display First

This field determines display to be initialized during startup. The default setting is *PCI Slot*.

Onboard FDD Controller

This should be enabled if your system has a floppy disk drive (FDD) installed on the system board and you wish to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.

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
Serial Port 3	3F8/IRQ9
Serial Port 4	2E8H/IRQ10
Parallel Port	378H/IRQ7

UART Mode Select

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

Onboard Parallel Mode

This field allows you to determine parallel port mode function.

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

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.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE CHS DETECTION
PNP/PCI CONFIGURATION	UP
LOAD BIOS DEFAULTS	AVING
LOAD SETUP DEFAULTS	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
F6 : Save CMOS to BIOS	F7 : Load CMOS From BIOS
Change / Set / Disable Password	

IDE HDD Auto Detection

This option detects the parameters of an IDE hard disk drive, and automatically enters them into Standard CMOS Setup screen.

ROM PCI/ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master:								
Select Primary Master Option (N=SKIP) : N								
OPTIONS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
1 (Y)	0	0	0	0	0	0	0	NORMAL
NOTE: Some OSes (like SCO-UNIX) must use "NORMAL" for installation								
ESC: SKIP								

Up to four IDE drives can be detected, with parameters for each appearing in sequence inside a box. To accept the displayed entries, press the "Y" key to skip to the next drive, press the "N" key. If you accept the values, the parameters will appear listed beside the drive letter on the screen.

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.

VGA Drivers Installation

This section provides information on how to install the C&T 69000 VGA drivers that come with your IB710 board. Please follow the instructions set forth in this section carefully. If the VGA drivers come in floppy diskettes, it is recommended that you make a backup copy of the VGA drivers and put the backup copy in a safe place.

For your information, Windows 2000 can detect the C&T 69000 VGA hardware and install the drivers automatically from the Windows 2000 CD.

The following items are covered in this section:

Installing the Drivers for Windows 95/98.....	55
Installing the Drivers for Windows NT 4.0	56

Installing the Drivers for Windows 95/98

The following section describes the normal display driver installation procedures for Windows 95/98. Use the following procedures when installing the display drivers for Windows 95/98.

1. Click **Start**, then **Settings**, then **Control Panel**.
2. Double click **Display**.
3. Select the **Settings** tab, click the **Change Display Type** button.
4. Click the **Change** button under **Adapter Type**.
5. Click the **Have Disk** button and press **OK**.
6. Specify the path to the new driver and press <ENTER>:
Example 1: Insert the driver CD in the CD-ROM drive, and enter
d:\vga\ct69000\win95 (assuming D: is the CD-ROM drive.)
Example 2: If you're not sure exactly where the drivers are, click the
Browse button to find them.
7. The *Select Device* dialog box will appear. Select the hardware that corresponds to the one you installed in your machine and click **OK**.
8. Windows 95/98 will copy the display drivers to the proper directories on your system.
9. Continue by choosing **Close**. You will be asked to restart your machine. Do so accordingly.
10. After the system has restarted, you can go back into the **Display** applet and select alternate screen resolutions and color depths.

Installing the Drivers for Windows NT 4.0

Once you are in the Windows NT 4.0 environment, follow the procedures below to install the VGA drivers that come with your embedded board.

1. Click the **Start** button, then go to **Settings** and click on **Control Panel**.
2. Click on the **Display** icon to start the *Display Properties* window.
3. Click on the **Settings** tab, and then click on **Display Type**.
4. In the *Change Display Type* window, click on **Change Adapter Type**. This will bring up the *Select Device* window.
5. In the *Change Display* window, click on **Have Disk**. Enter the directory where the Windows NT driver files are located as **d:\vga\ct69000\winnt40** (assuming D: is the CD-ROM drive.) Then select **OK**, or press **ENTER**.
6. Select **Chips Video Accelerator** from the display list provided, then click **OK** or press **ENTER**.
7. You will then see a warning panel about Third Party Drivers. Click on **Yes** to finish the installation.
8. Once the installation is complete, the system must be shut down and restarted for the new drivers to take effect.
9. When the system has restarted, the default graphics mode (usually 640x480x256color) has been automatically selected. Click the **Start** button, and then go to **Settings** and click on **Control Panel**. Click on the **Display** icon to start the *Display Properties* window. Click on the **Settings** tab. A new screen setting can be selected using either of the following methods:
 - A. Use the slide-bar in the Desktop Area to select new setting.
 - B. Click on **List All Modes**. From the list provided, select a new setting, then click **OK** or press **ENTER**.
 - C. Click on **Test** to test the newly selected graphics mode. Follow the instructions given on screen. A test screen should appear, followed by the *Testing Mode* window. Click on **Yes** to continue. Click on **Apply** to switch to the new graphics mode. Graphics modes are changed dynamically on NT 4.0, so you do not need to shut down and restart for the new screen settings to work.

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Audio Drivers Installation

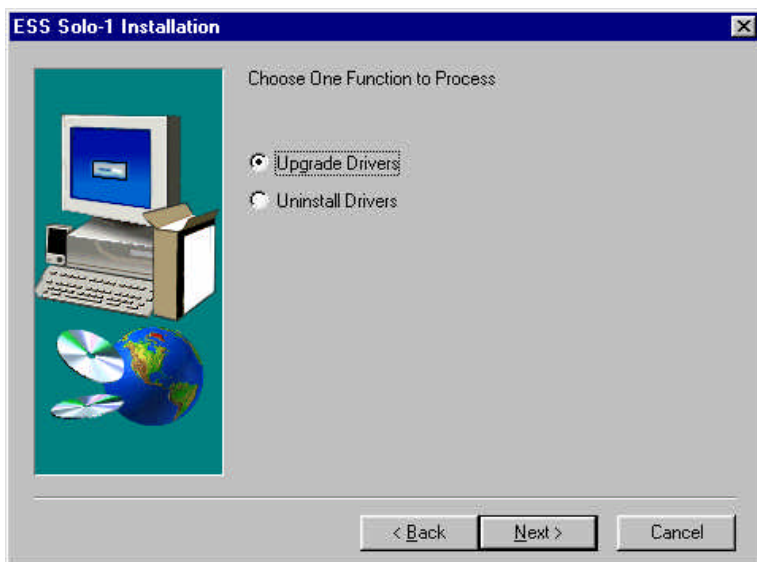
This section provides information on how to install the audio drivers for ESS Solo-1 ES1938S that come in floppy diskettes with your IB710 board. Please follow the instructions set forth in this section. It is recommended that you make a copy of the drivers and put the backup copy in a safe place.

The following items are covered in this section:

Installing the Audio Driver for Windows 95	59
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Installing the Audio Driver for Windows 95

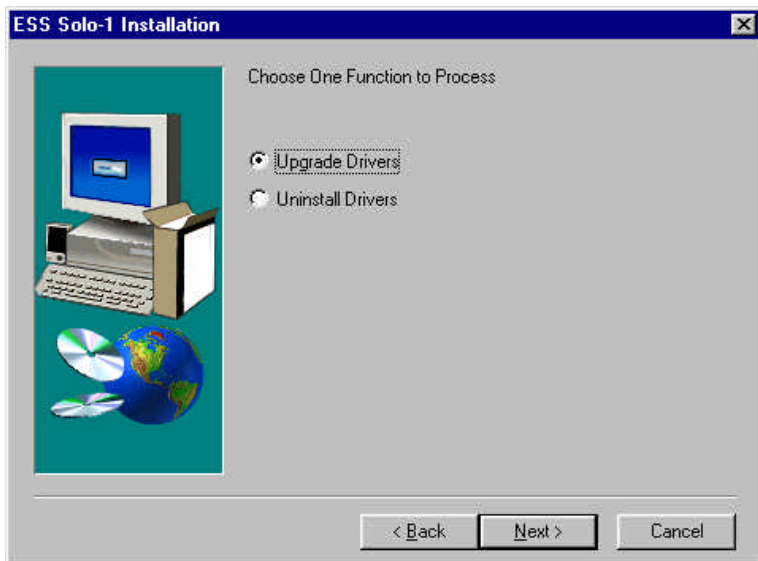
1. Turn on the computer and start Windows 95.
2. Insert the CD containing the ESS Solo-1 ES1938S audio drivers for Windows 95.
3. The CD autoruns and shows a screen with options for you to choose. Click on **Sound** and select **ESS Solo-1** to install the audio software and drivers. The welcome screen is then displayed.
4. Click the **Next** button to continue the installation process. When the ESS Solo-1 Installation window appears, select **Upgrade Drivers** and click the **Next** button.



5. After file copying is done, restart Windows 95.
6. When Windows restarts, it will detect a **PCI Multimedia Audio Device**. Insert the audio driver CD and click the **Next** button to start file copying, then click **Finish**.
7. When prompted to insert the Windows 95 CD, do accordingly and click **OK**. Key in the path (for example, d:\win95) where the Windows 95 files are located and click **OK**. The installation is complete.

Installing the Audio Driver for Windows 98

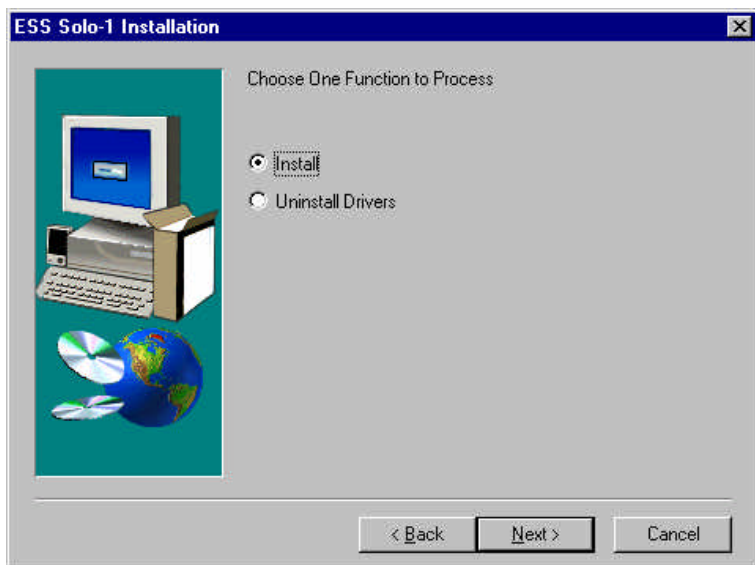
1. Turn on the computer and start Windows 98.
2. Insert the diskette containing the ESS Solo-1 ES1938S audio drivers for Windows 98.
3. The CD autoruns and shows a screen with options for you to choose. Click on **Sound** and select **ESS Solo-1** to install the audio software and drivers. The welcome screen is then displayed.
4. Click the **Next** button to continue the installation process. When the ESS Solo-1 Installation window appears, select **Upgrade Drivers** and click the **Next** button.



5. After file copying is done, restart Windows 98.
6. When Windows restarts, it will detect a *PCI Multimedia Audio Device*. Insert the audio driver CD and click the **Next** button. Click on the **Search for the best driver** checkbox, then click **Next**. Now install *The Update driver, ESSSolo-1 PCI Audio Device*. Click **Next** and then **Next** again to start file copying. After file copying is done, click **Finish**.
7. Now, Windows detects a new hardware which is the gameport joystick. Click **OK** and insert the Windows 98 CD and key in the path (for example, d:\win98) where the Windows 98 files are located and click **OK**. The installation is complete.

Installing the Audio Driver for Windows NT

1. Turn on the computer and start Windows NT.
2. Insert the diskette or CD containing the ESS Solo-1 ES1938S audio drivers for Windows NT.
3. The CD autoruns and shows a screen with options for you to choose. Click on **Sound** and select **ESS Solo-1** to install the audio software and drivers. The welcome screen is then displayed.
4. Click the **Next** button to continue the installation process. When the ESS Solo-1 Installation window appears, select **Upgrade Drivers** and click the **Next** button.



5. When the *Choose Driver Language* window appears, choose **English** and click the **Next** button to start file copying. After file copying is done, click **Finish** to restart Windows NT and for changes to take effect.

LAN Drivers Installation

This section describes LAN features and driver installation of the onboard Realtek RTL8139 Ethernet controller.

The following items are covered in this section:

Introduction.....	63
Features	63
Installing LAN Drivers for Windows 98/Windows 2000	64
Installing LAN Drivers for Windows 95.....	64
Installing LAN Drivers for Windows NT.....	65

Introduction

Realtek RTL8139 is a 32-bit 10/100MBps Ethernet controller for PCI local bus-compliant PCs. It supports bus mastering architecture, and auto-negotiation feature which make it possible to combine one common type of Ethernet cabling – an RJ-45 connector for twisted-pair cabling that can be used for both 10Mbps and 100Mbps connection. Extensive driver support for commonly used network operating systems is also provided.

Features

- Conforms to the Ethernet IEEE 802.3u standard
- Compatible with PCI Local Bus Revision 2.1 specification
- IEEE 802.3u Auto-Negotiation for automatic speed selection
- Supports Full-Duplex/Half-Duplex Operation
- Provides 32-bit bus mastering data transfer
- Supports 10Mbps and 100Mbps operation in a single port

The following section describes the installation driver procedure for Windows 98/Windows 2000, Windows 95, Windows NT, DOS, and Windows for Workgroup. To view the procedure of other operating systems, execute the **help8139.exe** in the diskette or CD supplied.

Installing LAN Drivers for Windows 98/Windows 2000

This section describes the procedure to install Windows 98 and Windows 2000 drivers for Realtek RTL8139 PCI Fast Ethernet controller.

1. Executing Windows 98/Windows2000 will auto-detect your system configuration and find the Ethernet hardware.
2. When asked to select the driver to install, select **Driver from disk provided by hardware manufacturer**.
3. Insert the CD containing the Realtek RTL8139 drivers into the CD-ROM drive and specify the setup file pathname as **d:\lan\realtek\win98** or **d:\lan\realtek\win2000** (assuming D: is your CD-ROM drive.)
4. After the driver files are copied, Windows 98/Windows2000 will appear with a message to insert Windows 98/Windows 2000 system disk to complete setup. Do so accordingly.
5. Windows 98/Windows2000 will finish other installation procedure automatically and ask you to restart the system.

Installing LAN Drivers for Windows 95

This section describes the procedure to install Windows 95 driver for Realtek RTL8139 PCI Fast Ethernet hardware.

1. Executing Windows 95 will auto-detect your system configuration and find the Ethernet hardware.
2. When asked to select the driver you want to install, select **Driver from disk provided by hardware manufacturer**.
3. Insert the CD containing the Realtek RTL8139 drivers into the CD-ROM drive and specify the setup file pathname as **d:\lan\realtek\win95** (assuming D: is your CD-ROM drive.)
4. Windows 95 will appear with a message to insert Windows 95 system disk to complete setup. Do so accordingly.
5. Windows 95 will finish other installation procedure automatically, and ask you to restart the system.

Installing LAN Drivers for Windows NT

This section describes the procedure to install Windows NT v3.5, v3.51 & v4.0 driver for Realtek RTL8139 PCI Fast Ethernet hardware.

When you are in Windows NT :

1. In the Main group of Windows NT, select the **Control Panel** icon.
2. In the *Control Panel* window, choose the **Network** icon.
3. In the Network Settings dialog box, choose the **Add Adapter** button.
The *Add Network Adapter* dialog box appears.
4. In the list of network cards, select **<other> Requires disk from manufacturer**, and then press **Enter** button.
5. Insert the CD containing the Realtek drivers, enter drive and pathname as d:\lan\realtek\winnt40 (assuming d: is the CD-ROM drive) where the setup file OEMSETUP.INF is located, and then choose the **OK** button.
6. The screen will appear *Select Line Speed* dialog box which is provided by RTL8139.SYS driver. The default value is *auto*. The RTL8139 PCI Fast Ethernet hardware and its driver RTL8139.SYS will auto-detect the line speed -- 10Mb or 100Mb, while the RTL8139.SYS is loading. The other values, *10* or *100*, are only used when you want to force RTL8139 PCI Fast Ethernet hardware to 10Mb or 100Mb.
7. The screen will show the *Input EthernetID* dialog box which is provided by RTL8139.SYS driver. This option is only required when you have more than one Realtek RTL8139 PCI Fast Ethernet hardware on the system. Select **SKIP** if only one Ethernet hardware installed on the computer.
8. After installation is complete, restart your system for changes to take effect.

Appendix

A. Post Codes

B. I/O Port Address Map

C. 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.

POST (hex)	Description
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 (Cyrilx or Intel) and CPU level (586 or 686).
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.

POST (hex)	Description
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.
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_Onboard_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 font 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. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used on the Embedded Little Board.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

C. 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 Embedded Little Board.

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