CPC-2245 Series

486 Mini Biscuit PC with VGA/LAN

User's Manual

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Acknowledgements

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Packing list

Before installing your board, ensure that the following materials have been received:

- 1 CPC-2245 all-in-one single board computer
- 3 floppy disks (or one CD-ROM) including Ethernet utility programs, and SVGA utility programs and drivers for Windows 3.1/95/98/NT
- 1 warranty certificate
- This user's manual

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Technical support and sales assistance

If you have any technical questions about the CPC-2245 or any other Advantech products, please visit our support website at:

http://support.advantech.com.tw

For more information about Advantech's products and sales information, please visit:

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Contents

Figures

Tables

CHAPTER 1

General Information

This chapter provides background information for the CPC-2245.

Sections include:

- Card specifications
- Board layout

1.1 Introduction

Advantech's new mini biscuit PC, the CPC-2245, is truly an all-in one 486 processor-based single board computer. It comes equipped with 32 MB DRAM on board, an SVGA interface which supports CRT monitors with up to 4 MB display memory, a 10/100Base-T Ethernet interface, and a CompactFlash solid state disk socket. In addition, it is equipped with two RS-232 serial ports, one bidirectional printer port which supports SPP, ECP and EPP modes, an IDE HDD interface, a floppy disk controller, as well as one ISA interface for functional expansion. With its industrial grade reliability, the CPC-2245 can operate continuously at temperatures up to 60º C (140º F). This compact unit offers all these functions within the space of a 2.5" hard disk drive (68 x 100 mm). All these numerous features provide an ideal price/performance solution for commercial and industrial applications where stability and reliability are essential.

The CPC-2245 mini biscuit PC's power can be supplied through a SODIMM socket or an on-board power connector. Thus, the CPC-2245 can be embedded into the user's system board, or used as a single board application. The ISA bus, HDD, FDD and parallel interface are connected to the user's system board via a SODIMM socket. This form factor has the benefits of easy maintenance. A damaged card can be replaced within 30 seconds. Furthermore, the mini biscuit PC is easily upgraded from 486 to Pentium® without the need to change the user's system board.

The CPC-2245 provides many useful functions in a tiny card. It reserves a small PCI connector for other extension modules, such as the CPC-2520 VGA/LCD module. It provides more flexible functions to satisfy all users' different application requirements.

The CPC-2245 is **small-sized, highly integrated, easy to maintain, easy to upgrade, and easy to install**. These features make it ideal for applications such as **small industrial controllers, panel PCs, security systems, Internet gateways, instruments, medical equipment, building automation,** and so on.

1.2 Specifications

- **CPU:** STPC Client, 66 MHz
- **On-card cache:** 8 KB
- **BIOS:** 256 KB Flash BIOS
- **Chipset:** STPC Client
- **Super I/O chipset:** Winbond W83977F
- **RAM memory:** 32 MB EDO RAM on board
- **Solid state disk:** Supports one CompactFlash card as an emulated HDD
- **Watchdog timer:** 1.6 sec. intervals

ISA/IDE/FDD/parallel port (144-pin SODIMM socket)

- **I/O expansion:** 16-bit AT-bus
- **Enhanced IDE hard disk drive interface:** Supports up to two hard disk drives. BIOS auto-detect
- **Floppy disk drive interface/multi-mode parallel port:** FDD interface and parallel port share the same connector. The FDD and/or parallel port can be switched in BIOS setup
  - FDD interface supports up to two floppy disk drives, 5.25" (360 KB and 1.2 MB) and/or 3.5" (720 KB, 1.44 MB and 2.88 MB)
  - Parallel supports SPP, ECP and EPP

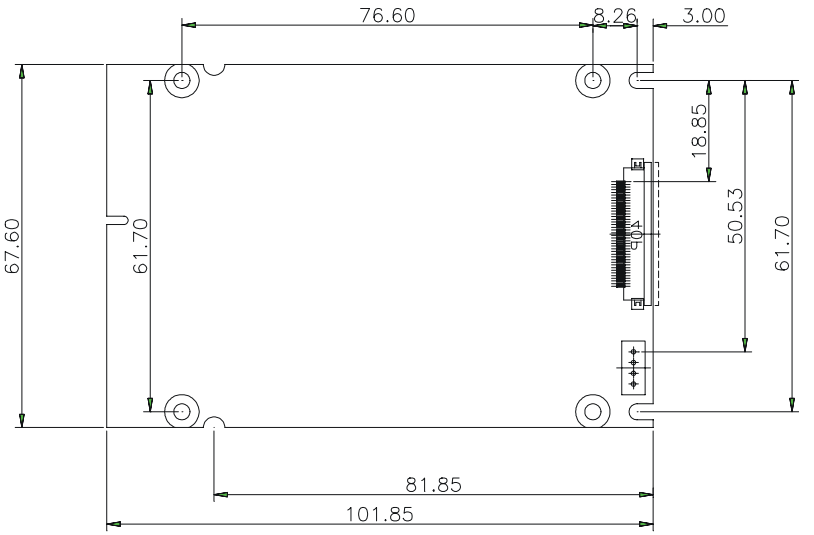
VGA/LAN/serial port/keyboard/mouse (40-pin FPC connector)

- **VGA with 64-bit windows accelerator**
  - **Display memory:** 4 MB share memory architecture (UMA structure)
  - **Display resolution:** 1280 x 1024 @ 64 K colors, 1024 x 768 @ 16 M colors
  - Automatically disables internal VGA if an external add-in VGA is plugged into the system
- **10/100Base-T Ethernet interface**
  - **Chipset**: RTL-8139A PCI local bus Ethernet controller
  - **Ethernet interface**: IEEE 802.3U compatible 100/10Base-T interface
- **Serial ports:** Two RS-232 serial ports
- **Keyboard and PS/2 mouse:** Supports standard PC/AT keyboard and PS/2 mouse
- **Power connector:** 4-pin mini power connector

Mechanical and environmental

- **Power supply voltage:** +5 V (4.75 ~ 5.25 V)
- **Max. power requirements:** +5 V @ 1.6 A
- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F)
- **Board size:** 68 x 100 mm
- **Weight:** 0.05 kg (0.11 lb)

1.3 Board layout: dimensions



CHAPTER 2

Installation

This chapter explains the setup procedures of CPC-2245 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.

2.1 Jumpers and connectors

On-board connectors link to external devices such as hard disk drives, keyboards, floppy drives, and so on. In addition, the board has jumpers for configuring your board for specific applications.

The table below lists the function of each of the board's jumpers and connectors. Later sections in this chapter give detailed information on each jumper setting, and instructions for connecting external devices to your card.

Table 2-1: Jumpers and connectors

Name	Function
CN1	PCI connector
CN2	CompactFlash socket
CN3	SODIMM gold finger (ISA/HDD/FDD/parallel/power)
CN4	I/O connector (LAN/VGA/RS-232/KB/mouse)
CN5	Power connector
J2	Clear CMOS
J3	Fan connector (reserved)

2.2 Board layout: jumper/connector locations

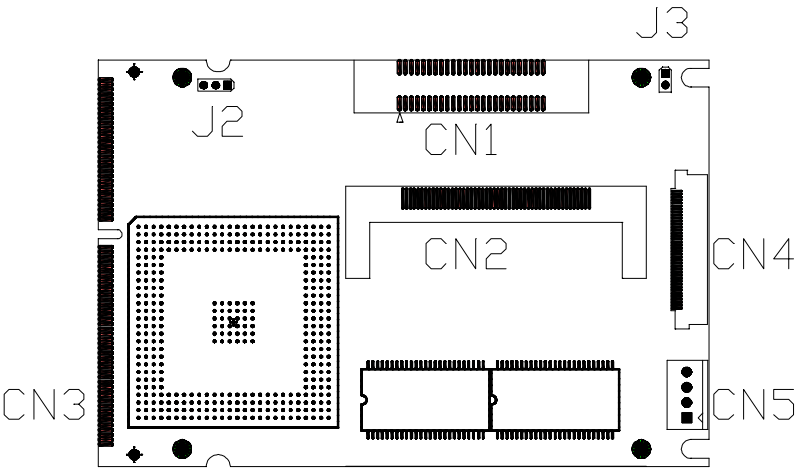


Figure 2-1: Board layout: jumper/connector locations

2.3 Safety precautions

Warning!

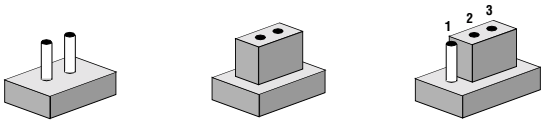
Always completely disconnect the power cord from your chassis whenever you are working on it. Do not --make connections while the power is on because sensitive electronic components can be damaged by the sudden rush of power. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.

2.4 Setting jumpers

You may configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electrical switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, you connect the pins with the clip. To "open" a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



Open **Closed** **Closed 2-3**

The jumper settings are schematically depicted in this manual as follows:

Open **Closed** **Closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

Generally, you simply need a standard cable to make most connections.

2.4.1 Clear CMOS (J2)

This jumper is used to erase CMOS data and reset system BIOS information.

The procedure for clearing CMOS is:

1. Turn off the system.
2. Short pin 2 and pin 3.
3. Turn on the system. The CMOS is now cleared.
4. Turn off the system. Short pin 1 and pin 2.
5. Turn on the system. The BIOS is now reset to its default setting.

Table 2-2: Clear CMOS (J2)

Function	1-2	2-3
Protect*	Closed	Open
Clear CMOS	Open	Closed

* default setting

2.5 CompactFlash interface (CN2)

This socket accepts an IDE-compatible CompactFlash memory card.

The CompactFlash interface uses a primary IDE channel, which should be set as the master channel.

2.6 ISA/IDE/floppy drive/parallel port (CN3)

The CPC-2245 provides a +5 V 16-bit ISA bus, one IDE channel (support two IDE devices), one parallel interface and one floppy interface (support two floppy drives). All these are provided via a 144-pin SODIMM gold finger (CN3), which can be plugged into a DODIMM socket on the user's system board. Users can choose suitable positions on their system board for their HDD, FDD or parallel connectors.

The floppy interface and parallel interface share the same pin assignment, so they cannot be used simultaneously. Users can select either an FDD or parallel port, by referring to their BIOS setup manual.

Table 2-3: ISA/IDE/floppy drive/parallel port connector (CN3)

Pin	Signal	Bus	Pin	Signal	Bus
1	+5 V	POWER	73	+5 V	POWER
2	ZW	ISA	74	RESET	IDE
3	SA18	ISA	75	RSTDRV	ISA
4	SA19	ISA	76	IRQ3	ISA
5	+5 V	POWER	77	GND	POWER
6	+5 V	POWER	78	DACK7	ISA
7	+5 V	POWER	79	DACK6	ISA
8	TC	ISA	80	DACK5	ISA
9	GND	POWER	81	DACK3	ISA
10	GND	POWER	82	DACK2	ISA
11	GND	POWER	83	DACK1	ISA
12	GND	POWER	84	DACK0	ISA
13	GND	POWER	85	HDCS0	IDE
14	GND	POWER	86	HDCS1	IDE
15	GND	POWER	87	GND	POWER
16	GND	POWER	88	IRQ7	ISA
17	IRQ6	ISA	89	IRQ9	ISA
18	IRQ5	ISA	90	IRQ10	ISA
19	IRQ4	ISA	91	IRQ11	ISA
20	SA10	ISA	92	SA11	ISA
21	SA9	ISA	93	SA8	ISA
22	SA14	ISA	94	SA13	ISA
23	SA17	ISA	95	SA16	ISA
24	SA12	ISA	96	SA15	ISA
25	IRQ12	ISA	97	IRQ15	ISA
26	SYSCLK	ISA	98	IRQ14	ISA
27	DRQ3	ISA	99	DRQ2	ISA
28	OSC (14 MHz)	ISA	100	DRQ5	ISA
29	DRQ1	ISA	101	DRQ6	ISA
30	DRQ0	ISA	102	DRQ7	ISA
31	HDACK	IDE	103	HDDRQ	IDE
32	HDIOW	IDE	104	HDIRQ	IDE
33	LA17	ISA	105	HDIOR	IDE
34	LA19	ISA	106	LA20	ISA
35	LA22	ISA	107	LA18	ISA

36	SA0	ISA	108	LA21	ISA
37	LA23	ISA	109	SA1	ISA
38	SA2	ISA	110	SA4	ISA
39	SA6	ISA	111	SA3	ISA
40	HDD0	IDE	112	SA7	ISA
41	HDD8	IDE	113	SA5	ISA
42	HDD2	IDE	114	HDD11	IDE
43	HDD1	IDE	115	HDD3	IDE
44	HDD6	IDE	116	HDD5	IDE
45	HDD10	IDE	117	HDD4	IDE
46	HDD7	IDE	118	HDD9	IDE
47	HDD14	IDE	119	HDD15	IDE
48	HDD13	IDE	120	HDD12	IDE
49	SD8	ISA	121	SD0	ISA
50	SD10	ISA	122	SD2	ISA
51	SD11	ISA	123	SD3	ISA
52	SD9	ISA	124	SD4	ISA
53	SD14	ISA	125	SD1	ISA
54	SD13	ISA	126	SD6	ISA
55	SD12	ISA	127	SD7	ISA
56	BALE	ISA	128	SD5	ISA
57	SD15	ISA	129	IOCHRDY	ISA
58	SMEMR	ISA	130	MEMW	ISA
59	SBHE	ISA	131	IOR	ISA
60	MEMR	ISA	132	MASTER	ISA
61	IOCS16	ISA	133	SMEMW	ISA
62	IOCHCK	ISA	134	MEMCS16	ISA
63	REFRESH	ISA	135	IOW	ISA
64	ACK	PRT	136	AEN	ISA
65	PE	PRT	137	BUSY	PRT
66	PD6	PRT	138	PD5	PRT
67	PD4	PRT	139	PD3	PRT
68	PD2	PRT	140	PD1	PRT
69	PD0	PRT	141	AUTOFD	PRT
70	STROBE	PRT	142	ERR	PRT
71	INIT	PRT	143	PD7	PRT
72	SLCTIN	PRT	144	SLCT	PRT

2.6.1 ISA bus

Table 2-4: ISA bus - CN3 cross reference table (ISA pin A)

ISA bus Pin	Signal	CN3 Pin	Signal
A1	I/O CHCK	62	IOCHCK
A2	SD7	127	SD7
A3	SD6	126	SD6
A4	SD5	128	SD5
A5	SD4	124	SD4
A6	SD3	123	SD3
A7	SD2	122	SD2
A8	SD1	125	SD1
A9	SD0	121	SD0
A10	I/OCHRDY	129	IOCHRDY
A11	AEN	136	AEN
A12	SA19	4	SA19
A13	SA18	3	SA18
A14	SA17	23	SA17
A15	SA16	95	SA16
A16	SA15	96	SA15
A17	SA14	22	SA14
A18	SA13	94	SA13
A19	SA12	24	SA12
A20	SA11	92	SA11
A21	SA10	20	SA10
A22	SA9	21	SA9
A23	SA8	93	SA8
A24	SA7	112	SA7
A25	SA6	39	SA6
A26	SA5	113	SA5
A27	SA4	110	SA4
A28	SA3	111	SA3
A29	SA2	38	SA2
A30	SA1	109	SA1
A31	SA0	36	SA0

Table 2-5: ISA bus - CN3 cross reference table (ISA bus pin B)

ISA bus		CN3	
Pin	**Signal**	**Pin**	**Signal**
B1	GND	9	GND
B2	RSTDRV	75	RSTDRV
B3	+5 V	1	+5 V
B4	IRQ9	89	IRQ9
B5	-5 V	-	-
B6	DRQ2	99	DRQ2
B7	-12 V	-	-
B8	0 WS	2	ZW
B9	+12 V	-	-
B10	GND	10	GND
B11	SMEMW	133	SMEMW
B12	SMEMR	58	SMEMR
B13	IOW	135	IOW
B14	IOR	131	IOR
B15	DACK3	81	DACK3
B16	DRQ3	27	DRQ3
B17	DACK1	83	DACK1
B18	DRQ1	29	DRQ1
B19	REFRESH	63	REFRESH
B20	CLK	26	SYSCLK
B21	IRQ7	88	IRQ7
B22	IRQ6	17	IRQ6
B23	IRQ5	18	IRQ5
B24	IRQ4	19	IRQ4
B25	IRQ3	76	IRQ3
B26	DACK2	82	DACK2
B27	T/C	8	TC
B28	BALE	56	BALE
B29	+5 V	73	+5 V
B30	OSC	28	OSC (14 MHz)
B31	GND	11	GND

Table 2-6: ISA bus - CN3 cross reference table (ISA bus pin C)

ISA bus Pin	Signal	CN3 Pin	Signal
C1	SBHE	59	SBHE
C2	LA23	37	LA23
C3	LA22	35	LA22
C4	LA21	108	LA21
C5	LA20	106	LA20
C6	LA19	34	LA19
C7	LA18	107	LA18
C8	LA17	33	LA17
C9	MEMR	60	MEMR
C10	MEMW	130	MEMW
C11	SD8	49	SD8
C12	SD9	52	SD9
C13	SD10	50	SD10
C14	SD11	51	SD11
C15	SD12	55	SD12
C16	SD13	54	SD13
C17	SD14	53	SD14
C18	SD15	57	SD15

Table 2-7: ISA bus - CN3 cross reference table (IDE pin D)

ISA bus		CN3	
Pin	**Signal**	**Pin**	**Signal**
D1	MEMCS16	134	MEMCS16
D2	I/OCS16	61	IOCS16
D3	IRQ10	90	IRQ10
D4	IRQ11	91	IRQ11
D5	IRQ12	25	IRQ12
D6	IRQ15	97	IRQ15
D7	IRQ14	98	IRQ14
D8	DACK0	84	DACK0
D9	DRQ0	30	DRQ0
D10	DACK5	80	DACK5
D11	DRQ5	100	DRQ5
D12	DACK6	79	DACK6
D13	DRQ6	101	DRQ6
D14	DACK7	78	DACK7
D15	DRQ7	102	DRQ7
D16	+5 V	5	+5 V
D17	MASTER	132	MASTER
D18	GND	12	GND

2.6.2 IDE interface

Users can attach two IDE devices to the IDE channel, one drive must be set as the master and another as the slave. You may do this by setting the jumpers on the drives. Refer to the documentation that came with your drive for more information.

A jumper diagram usually appears on the top side of a hard disk drive.

IDE hard drive connector

Table 2-8: IDE hard drive connector

IDE connector Pin	Signal	CN3 Pin	Signal	IDE connector Pin	Signal	CN3 Pin	Signal
1	IDE RESET	74	RESET	2	GND	13	GND
3	DATA 7 (*2)	46	HDD7	4	DATA 8 (*2)	41	HDD8
5	DATA 6 (*2)	44	HDD6	6	DATA 9 (*2)	118	HDD9
7	DATA 5 (*2)	116	HDD5	8	DATA 10 (*2)	45	HDD10
9	DATA 4 (*2)	117	HDD4	10	DATA 11 (*2)	114	HDD11
11	DATA 3 (*2)	115	HDD3	12	DATA 12 (*2)	120	HDD12
13	DATA 2 (*2)	42	HDD2	14	DATA 13 (*2)	48	HDD13
15	DATA 1 (*2)	43	HDD1	16	DATA 14 (*2)	47	HDD14
17	DATA 0 (*2)	40	HDD0	18	DATA 15 (*2)	119	HDD15
19	SIGNAL GND	14	GND	20	N/C	-	-
21	DMA REQUEST	103	HDDRQ	22	GND	14	GND
23	IO WRITE (*2)	32	HDIOW	24	GND	14	GND
25	IO READ (*2)	105	HDIOR	26	GND	15	GND
27	IO CHANNEL READY	129	IOCHRDY	28	GND (*1)	15	GND
29	HDACK	31	HDACK	30	GND	16	GND
31	IRQ	104	HDIRQ	32	N/C	-	-
33	ADDR 1	107	LA18	34	N/C	-	-
35	ADDR 0	33	LA17	36	ADDR 2	-	-
37	HARD DISK SELECT 0 (*2)	85	HDCS0	38	HARD DISK SELECT 1 (*2)	86	HDCS1
39	IDE ACTIVE			40	GND	16	-
41	VCC	6	+5 V	42	VCC	6	+5 V
43	GND	16	GND	44	N/C	-	-

*Note *1:* *IDE pin 28 must pull 470 ohms resistor to GND.*

*Note *2:* *33 ohms damping resistors is recommended to connect near IDE connector. Please refer to Fig. 2-2 below.*

*Note *3:* *We do not recommend connection to the following IDE HDD models of Seagate: ST 31276A, ST 31720A, ST 32531A, ST 33240A or ST 34340A*

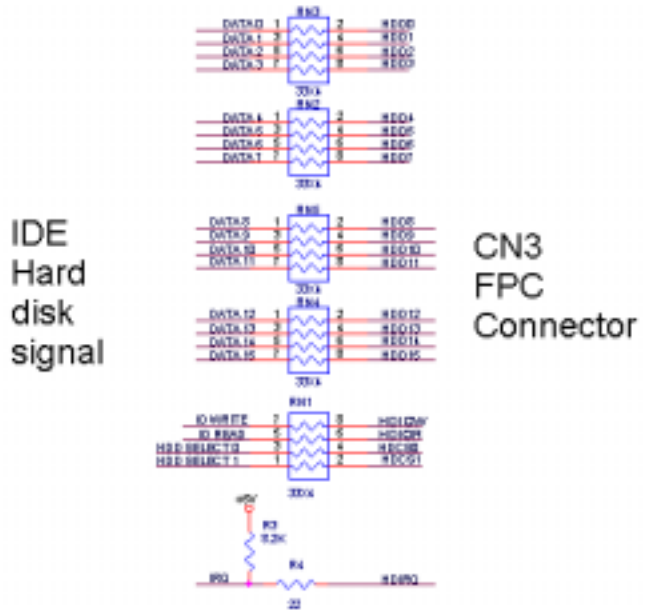


Figure 2-2: Damping resistor

2.6.3 Floppy drive

Users can attach up to two floppy disk drives to the CPC-2245 via a SODIMM socket. The CPC-2245 supports any combination of 5.25" (360 KB / 1.2 MB) and/or 3.5" (720 KB / 1.44/2.88 MB) drives.

The following table lists the pin assignments for the floppy disk connector:

Table 2-9: Floppy drive connector

FDD connctr. CN3				FDD connector		CN3	
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	GND	9	GND	2	High density	141	AUTOFD
3	GND	9	GND	4	N/C		
5	GND	10	GND	6	N/C		
7	GND	10	GND	8	Index	69	PD0
9	GND	11	GND	10	Motor enable A	66	PD6
11	GND	11	GND	12	Driver select B	64	ACK
13	GND	12	GND	14	Driver select A	143	PD7
15	GND	12	GND	16	Motor enable B	137	BUSY
17	GND	13	GND	18	Direction	71	INIT
19	GND	13	GND	20	Step pulse	72	SLCTIN
21	GND	14	GND	22	Write data	65	PE
23	GND	14	GND	24	Write enable	144	SLCT
25	GND	15	GND	26	Track 0	140	PD1
27	GND	15	GND	28	Write protect	68	PD2
29	GND	16	GND	30	Read data	139	PD3
31	GND	16	GND	32	Select head	142	ERR
33	GND	9	GND	34	Disk change	67	PD4

2.6.4 Parallel port

The parallel port is normally used to connect the CPU card to a printer through a DB25 connector. The CPC-2245 includes an on-board parallel port, accessed through a SO. DIMM golden finger. The parallel port is designated as LPT1 and can be disabled or changed to LPT2 or LPT3 in the BIOS setup manual.

Table 2-10: Parallel port connector

Printer port		CN3		Printer port		CN3	
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	/STROBE	70	STROBE	14	\AUTOFD	141	AUTOFD
2	DO	69	PD0	15	ERR	142	ERR
3	D1	140	PD1	16	\INIT	71	INIT
4	D2	68	PD2	17	\SLCTINI	72	SLCTIN
5	D3	139	PD3	18	GND	9	GND
6	D4	67	PD4	19	GND	9	GND
7	D5	138	PD5	20	GND	10	GND
8	D6	66	PD6	21	GND	10	GND
9	D7	143	PD7	22	GND	11	GND
10	\ACK	64	ACK	23	GND	11	GND
11	BUSY	137	BUSY	24	GND	12	GND
12	PE	65	PE	25	GND	12	GND
13	SLCT	144	SLCT				

2.7 VGA/LAN/serial ports/keyboard/ mouse (CN4)

The CPC-2245 provides a VGA interface, a 10/100 Base-T Ethernet, two RS-232 serial ports, one keyboard and one PS2 mouse through a 40-pins FPC connector (CN4). User can design their FPC cable for connecting CPC-2245's FPC connector to user's system board. User can choose suitable position to layout VGA, LAN, COM port, Keyboard and mouse connector on user's system board.

Table 2-11: FPC connector (CN4)

Pin	Signal	Pin	Signal
1	GND	21	DSR2
2	KBVCC	22	RX2
3	EXT RESET	23	CD2
4	DDC1	24	TX2
5	DDC0	25	RI2
6	V SYNC	26	CTS2
7	H SYNC	27	RTS2
8	BLUE	28	DTR2
9	GREEN	29	KBVCC
10	RED	30	MSDT
11	KBVCC	31	KBDT
12	GND	32	KBCK
13	RI1	33	MSCK
14	CTS1	34	GND
15	RTS1	35	TPT-
16	DTR1	36	TPT+
17	TX1	37	GND
18	CD1	38	TPR-
19	RX1	39	TPR+
20	DSR1	40	GND

2.7.1 VGA interface

The VGA connector is a 15-pin D-SUB connector. Users can follow a transfer table to layout these VGA signals to a standard 15-pin D-SUB connector.

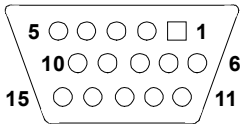


Table 2-12: VGA interface

VGA Pin	Signal	CN4 Pin	Signal	VGA Pin	Signal	CN4 Pin	Signal
1	RED	10	RED	9	Vcc	2	KBVCC
2	GREEN	9	GREEN	10	GND	1	GND
3	BLUE	8	BLUE	11	N/C	-	-
4	N/C	-	-	12	SDT	5	DDC0
5	GND	1	GND	13	H-SYNC	7	H SYNC
6	GND	1	GND	14	V-SYNC	6	V SYNC
7	GND	12	GND	15	SCK	4	DDC1
8	GND	12	GND				

2.7.2 Ethernet configuration

The CPC-2245 is equipped with a high performance 32-bit PCI-bus Fast Ethernet interface that are fully compliant with IEEE 802.3u 10/100Base-T specifications. Ethernet connector is a RJ-45 jack. User can follow a transfer table to connect Ethernet signals to a standard RJ-45 connector.

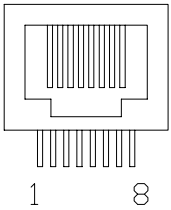


Table 2-13: Ethernet configuration

RJ-45 Pin	Signal	CN4 Pin	Signal	RJ-45 Pin	Signal	CN4 Pin	Signal
1	TD+	36	TPT+	2	TD -	35	TPT-
3	RD+	39	TPR+	4	NC	-	-
5	NC	-	-	6	RD-	38	TPR-
7	NC	-	-	8	NC	-	-

2.7.3 Keyboard and PS/2 mouse connector

The CPC-2245 provides a keyboard and PS2 mouse interface through a 40-pin FPC connector (CN4) for connection of PS/2 keyboard and PS/2 mouse.

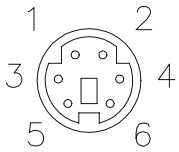
In most cases, especially in embedded applications, a keyboard is not used. The standard PC/AT BIOS will report an error or fail during power-on self-test (POST) after a reset if the keyboard is not present. The CPC-2245's BIOS "Standard CMOS Features" allows you to select "Halt on" under the "All, but keyboard" or "All, but disk/key" selection. This allows no-keyboard operation in embedded system applications without the system halting under POST (power on self test).

Table 2-14: PS/2 keyboard connector

PS/2 Keyboard		CN4		PS/2 Keyboard		CN4	
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	KB_Data	31	KBDT	4	Vcc	29	KBVCC
2	NC	-	-	5	KBCLK	32	KBCK
3	GND	34	GND	6	NC	-	-

Table 2-15: PS/2 mouse connector

PS/2 Mouse		CN4		PS/2 Mouse		CN4	
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	MDATA	30	MSDT	4	Vcc	29	KBVCC
2	NC	-	-	5	MCLK	33	MSCK
3	GND	34	GND	6	NC	-	-



2.7.4 Serial ports

The CPC-2245 offers two serial ports: COM1 and COM2, both in RS- 232. These ports let you connect to serial devices (a mouse, printers, etc.) or a communication network.

You can select the address for each port (For example, 3F8H [COM1], 2F8H [COM2]) or disable it, using the BIOS Advanced Setup program. Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

The IRQ and address range for both ports are fixed. However, if you wish to disable the port or change these parameters later, you can do this in the system BIOS setup. The table below shows the settings for the CPC-2245 board's ports:

Table 2-16: Serial port default settings

Port	Address	Default
COM1	3F8, 2F8, 3E8, 2E8	3F8/IRQ4
COM2	3F8, 2F8, 3E8, 2E8	2F8/IRQ3

The following table shows the pin assignments for the card's RS-232 port:

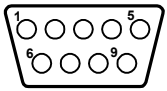


Table 2-17: COM1 RS-232 serial port connector

RS-232		CN4		RS-232		CN4	
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	DCD	18	CD1	6	DSR	20	DSR1
2	RX	19	RX1	7	RTS	15	RTS1
3	TX	17	TX1	8	CTS	14	CTS1
4	DTR	16	DTR1	9	RI	13	RI1
5	GND	37	GND				

Table 2-18: COM2 RS-232 serial port connector

RS-232		CN4		RS-232		CN4	
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	DCD	23	CD2	6	DSR	21	DSR2
2	RX	22	RX2	7	RTS	27	RTS2
3	TX	24	TX2	8	CTS	26	CTS2
4	DTR	28	DTR2	9	RI	25	RI2
5	GND	40	GND				

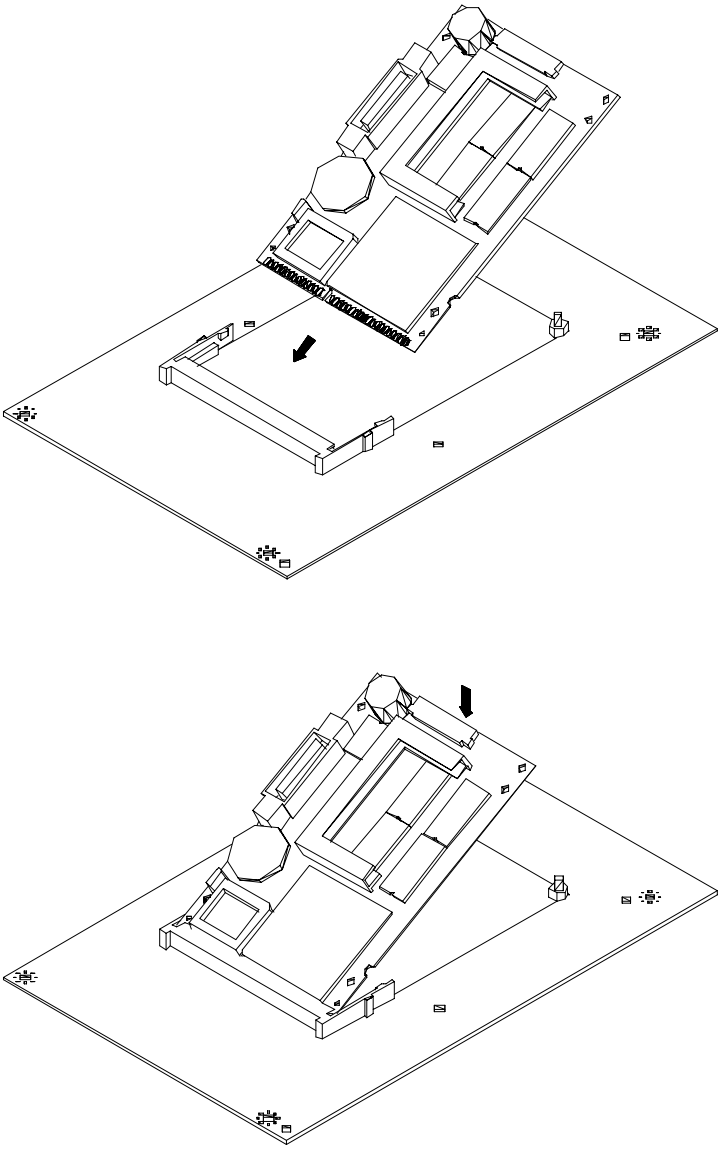
2.8 Power supply connector (CN5)

In single board computer without carrier applications, user may connect a power directly to the CPC-2245 board through CN5. See the following table for its pin assignments:

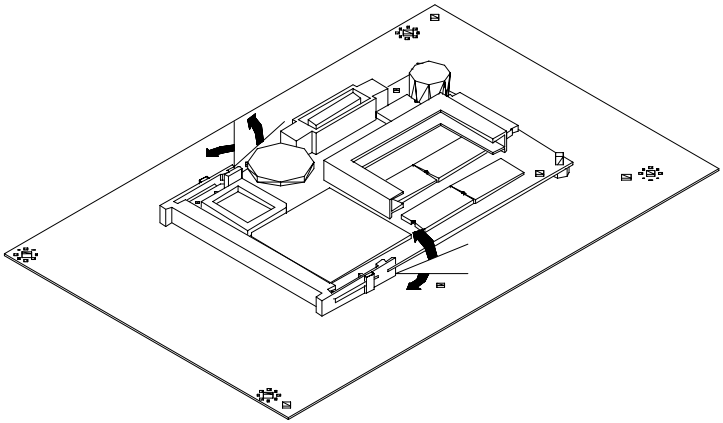
Table 2-19: Power supply connector (CN5)

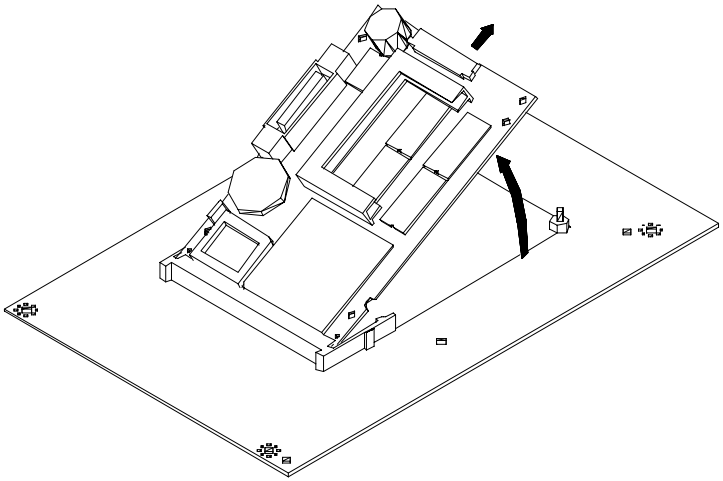
Pin	Function
1	+5 V
2	GND
3	GND
4	+5 V

2.9 Card installation

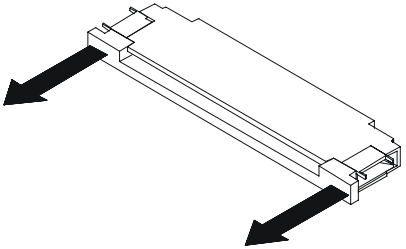


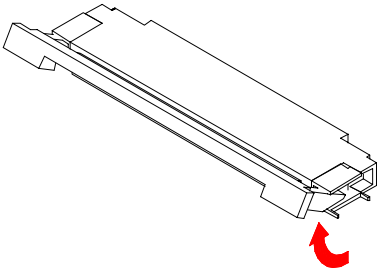
2.10 Card removal

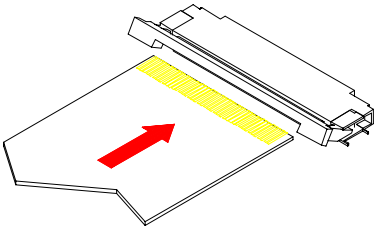


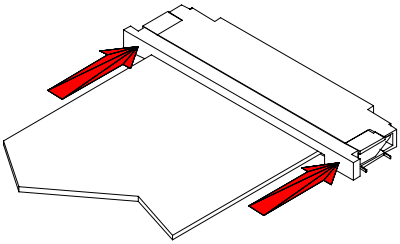


2.11 FPC cable installation









CHAPTER 3

Award BIOS Setup

This chapter describes how to set the BIOS configuration data.

3.1 General information

Award BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM so that it retains the setup information when the power is turned off.

3.2 Starting Award BIOS setup

As POST executes, the following appears:

```
Hit <DEL> if you want to run SETUP
Press <DEL> to run AWARDBIOS setup.
```

Award BIOS main menu

The Award BIOS setup screen appears as follows:

Figure 3-1: Main menu

3.3 Standard CMOS features

Choose the "Standard CMOS Features" option from the main menu, and the screen below will be displayed. This standard setup menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

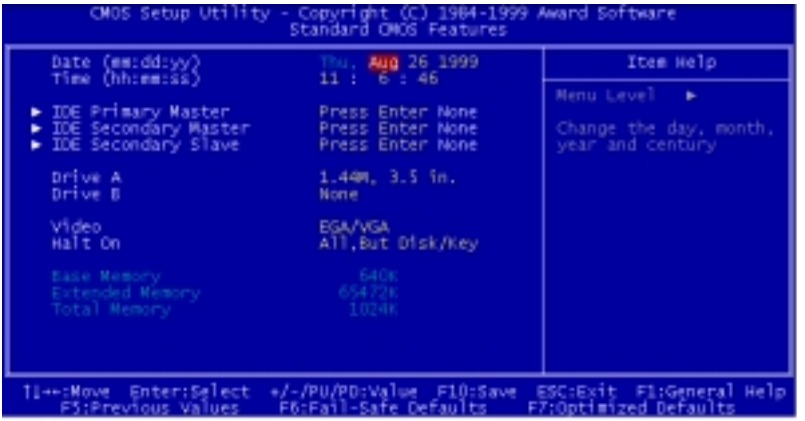


Figure 3-2: Standard CMOS setup screen

3.4 Advanced BIOS features

The screen below appears when choosing the "Advanced BIOS Features " item from the main menu. It allows the user to configure the CPC-2245 according to his particular requirements. Below are some major items that are provided in the Advanced BIOS FEATURES setup screen.

A quick booting function is provided for your convenience. Simply enable the Quick Power On Self Test item to save yourself valuable time.

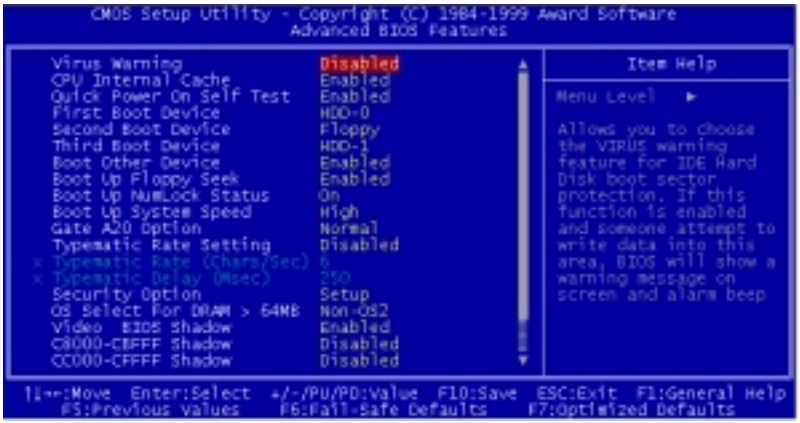


Figure 3-3: BIOS features setup screen

Virus Warning

While the system is booting up, and after boot-up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system. In this case, a warning message will be displayed. You can run the anti-virus program to locate the problem.

If Virus Warning is disabled, no warning message will appear if anything attempts to access the boot sector or hard disk partition.

Quick Power On Self Test

This option speeds up the Power-On Self Test (POST) conducted as soon as the computer is turned on. When enabled, BIOS shortens or skips some of the items during the test. When disabled, the computer conducts normal POST procedures.

Boot Sequence

This function determines the sequence in which the computer will search the drives for the disk operating system (i.e. DOS). The user can define boot sequences from following devices:

Floppy

HDD-0

SCSI

CDROM

HDD-1

HDD-2

HDD-3

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. A 360 KB type drive is 40 tracks; while 720 KB, 1.2 MB, and 1.44 MB type drives are all 80 tracks.

Enabled BIOS searches the floppy drive to determine if it is 40 or 80 tracks. Note that BIOS cannot differentiate 720 KB, 1.2 MB, and 1.44 MB type drives as they are all 80 tracks.

Disabled BIOS will not search for the floppy drive type by track number. Note that there will not be any warning message if the drive installed is 360 KB.

Boot Up NumLock Status

The default is On.

On Keypad boots up to number keys.

Off Keypad boots up to arrow keys.

Gate A20 Option

Normal The A20 signal is controlled by the keyboard controller or chipset hardware.

Fast (Default) The A20 signal is controlled by Port 92 or the chipset specific method.

Typematic Rate Setting

The typematic rate determines the characters per second accepted by the computer. The Typematic Rate setting enables or disables the typematic rate.

Typematic Rate (Chars/Sec)

BIOS fix the following input values (characters/second) for typematic rate: 6.

Typematic Delay (msec)

Typematic delay is the time interval between the appearance of the first and second characters, when holding down a key. The input value is: 250 (msec).

Security Option

This setting determines whether the system will boot up if the password is denied. Access to Setup is, however, always limited.

System The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.

Setup The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

OS Select for DRAM > 64 MB

This setting is under the OS/2 system.

Video BIOS Shadow

This determines whether video BIOS will be copied to RAM, which is optional according to the chipset design. When enabled, Video BIOS

Shadow increases the video speed.

C8000-CBFFF Shadow / CC000-CFFFF Shadow

These determine whether optional ROM will be copied to RAM in blocks of 16 KB.

Enabled	Optional shadow is enabled.
Disabled	Optional shadow is disabled.

3.5 Advanced chipset features

By choosing the "Advanced CHIPSET FEATURES" option from the Main menu, the screen below will be displayed.

This sample screen contains the manufacturer default values for the CPC-2245.

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen, because they provide the best operating conditions for your system.

Video Memory Size

The CPC-2245 adopts VGA share memory structure. Video memory size can be selected from 512 KB to 4096 KB. Onboard VGA video memory size should be zero, in order to release memory when the onboard VGA function is not used. Video memory size will be unchangeable and released automatically when the CPC-2520 LCD module is plugged into the CPC-2245.

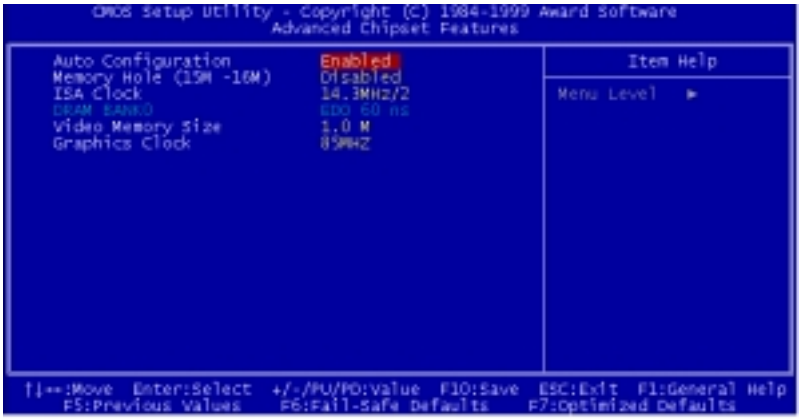


Figure 3-4: CHIPSET features setup screen

3.6 Integrated peripherals

Figure 3-5: Integrated peripherals

Onboard FDC Controller

This option enables the floppy drive controller on the CPC-2245.

The settings are Enabled, or Disabled.

Onboard Serial Port 1/2

This option enables serial port 1/2 on the board and specifies the base I/O port address for serial port 1~2.

The settings are Disabled, 3F8h/IRQ4, 3E8h/IRQ4, 2E8h/IRQ3, and 2F8h/IRQ3.

Onboard Parallel Port

This option enables the parallel port on the CPC-2245 and specifies the parallel port's base I/O address. The settings are Disabled, 378/IRQ7, 3BC/IRQ7 and FDD. The default setting is 378/IRQ7.

The CPC-2245's floppy interface and parallel port share the same pin assignment. When "On board Parallel port" is setting to FDD, floppy drive will be enabled and printer port will be disabled. If "On board Parallel port" is setting to either Disabled, 378/IRQ7 or 3BC/IRQ7, printer port will be enable but floppy drive will be disable.

Parallel Port Mode

This option specifies the parallel port mode. The settings are SPP, EPP, ECP and EPP+ECP.

Setting	Description
SPP	The normal parallel port mode is used.
EPP	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification.

EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device.

ECP The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve transfer rates of approximately 2.5 Mbs. ECP provides symmetric bidirectional communications.

3.7 Power management setup

The power management setup controls the CPU card's "green" features. The following screen shows the manufacturer defaults.

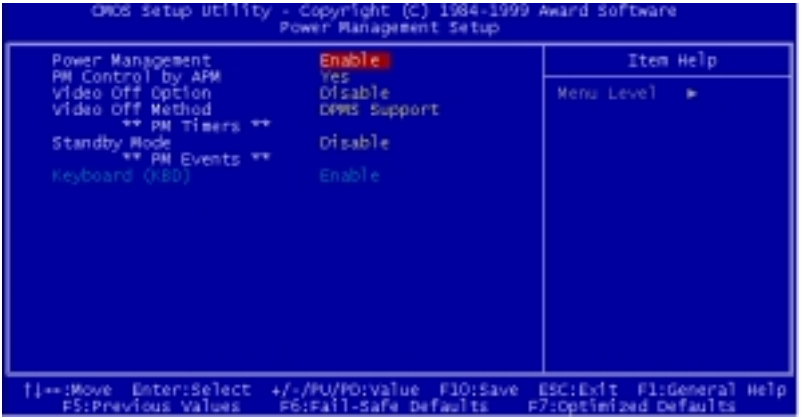


Figure 3-6: Power management setup screen

Power Management

Power management lets you set up your computer to save electricity when it is not actively in use by putting the system into progressively greater power saving modes. There are two selections for Power Management (Mode):

Disabled Turns off PM

Enabled Maximized power saving by activating maximum power saving settings after one minute of system inactivity.

When PM is set to Disabled, some items which are predefined will become unmodifiable.

Standby mode

This sets the period of system inactivity after which the system goes into Standby mode, the intermediate power saving state.

The settings range from 2 minutes to 16 minutes and can be set manually when power management is Enable. The default setting is Disabled. When the system goes into power saving mode, power management will skip to the next mode in the sequence if this is disabled.

3.8 PnP/PCI configuration setup

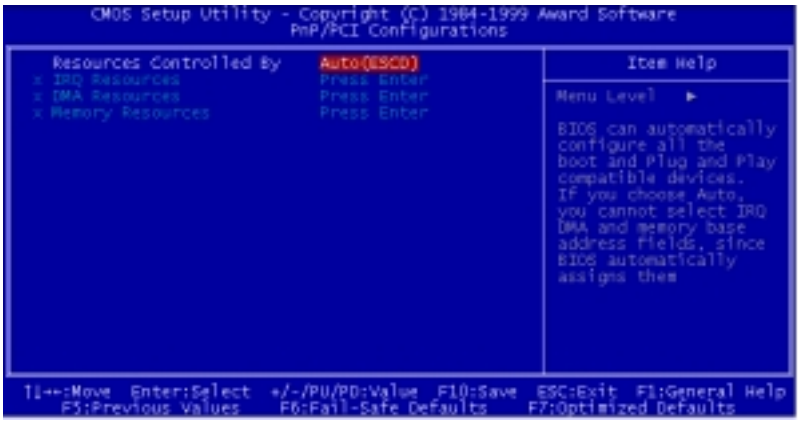


Figure 3-7: PCI configuration screen

Resources Control

When Resources Controlled by Auto(ESCD), BIOS can automatically configure all the boot and plug and play compatible devices. IRQ, DMA and Memory resources will become unmodifiable.

When Resources Controlled by Manual, IRQ, DMA and Memory resource can be set up manually.

IRQ resources

These fields indicate whether or not the displayed IRQ for each field is being used by a legacy (non-PnP card). Two options are available: PCI/ISA PnP or Legacy. The first option, the default setting, indicates that the displayed IRQ is not used to determine if an ISA card is using that IRQ. If you install a legacy ISA card that requires a unique IRQ, you must set the field for that IRQ to "Legacy". Say for example that you install a legacy ISA card that requires IRQ10. You must then set "IRQ10" assigned to "Legacy".

DMA resources

These fields indicate whether or not the displayed DMA for each field is being used by a legacy (non-PnP card). Two options are available: PCI/ISA PnP or Legacy. The first option, the default setting, indicates that the displayed IRQ is not used to determine if an ISA card is using that IRQ. If you install a legacy ISA card that requires a unique DMA, you must set the field for that IRQ to "Legacy".

Memory resources

Memory length can be reserved as 8 KB, 16 KB, 32 KB or 64 KB and its address can be selected from C8000 to DC000. Reserved memory address will not be modified when "Reserved Memory Base" is N/A.

3.9 Load fail-safe defaults

Load Fail-safe Defaults indicates the most appropriate values for the system parameters for stability. These default values are loaded automatically if the stored record created by the setup program becomes corrupted (and therefore unusable).

3.10 Load optimized defaults

"Load Optimized Defaults" loads the values required by the system for maximum performance.

3.11 Password setting

To change the password:

1. Choose the "SET PASSWORD" option from the main menu and press <Enter>.

The screen will display the following message:

Enter Password:

Press <Enter>.

2. If the CMOS is good or if this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

Confirm Password:

Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS.

The password must be no longer than eight (8) characters.

Remember, to enable the password seeting feature, you must first select either SETUP or SYSTEM in "Security Option" item of "Advanced BIOS features".

3.12 Save & exit setup

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.13 Exit without saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

CHAPTER 4

Software Configuration

This chapter details the software configuration information. It shows you how to configure the card to match your application requirements.

Sections include:

- Ethernet interface configuration

4.1 Ethernet software configuration

The CPC-2245 on-board Ethernet interface supports all major network operating systems. To configure the medium type, to view the current configuration, or to run diagnostics, do the following:

1. Power the CPC-2245 on. Ensure that the RSET8139.EXE file is located in the working drive.
2. At the prompt type RSET8139.EXE and press <Enter>. The Ethernet configuration program will then be displayed.
3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and Down keys. To change a selected item, press <Enter>, and a screen will appear with the available options. Highlight your option and press <Enter>. Each highlighted option has a helpful message guide displayed at the bottom of the screen for additional information.
4. After you have made your selections and are sure this is the configuration you want, press ESC. A prompt will appear asking if you want to save the configuration. Press Y if you want to save.

The Ethernet Setup Menu also offers three very useful diagnostic functions. These are:

1. Run EEPROM test
2. Run Diagnostics on Board
3. Run Diagnostics on Network

Each option has its own display screen that shows the format and result of any diagnostic tests undertaken.

CHAPTER 5

PCI Bus Ethernet Interface

This chapter provides information on Ethernet configuration.

- Introduction
- Installation of Ethernet driver for
  - MS-DOS and Windows 3.1
  - Windows 95
  - Windows NT

5.1 Introduction

The CPC-2245 is equipped with a high performance 32-bit Ethernet chipset which is fully compliant with IEEE 802.3 100 Mbps CSMA/CD standards. It is supported by major network operating systems. It is also both 100Base-T and 10Base-T compatible. The medium type can be configured via the RSET8139.exe program included on the utility disk.

5.2 Installation of Ethernet driver

Before installing the Ethernet driver, note the procedures below. You must know which operating system you are using in your CPC-2245, and then refer to the corresponding installation flow chart. Then just follow the steps described in the flow chart. You will quickly and successfully complete the installation, even if you are not familiar with instructions for MS-DOS or WINDOWS.

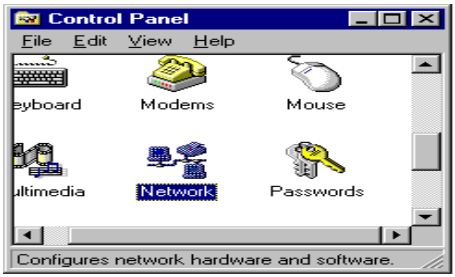
Note: The windows illustrations in this chapter are examples only. You must follow the flow chart instructions and pay attention to the instructions which then appear on your screen.

5.2.1 Installation for MS-DOS and Windows 3.1

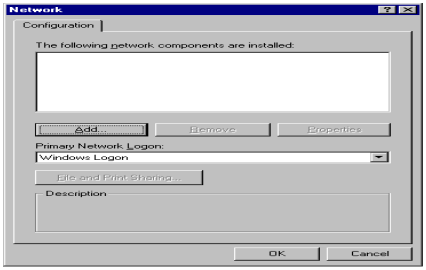
If you want to set up your Ethernet connection under the MS-DOS or Windows 3.1 environment, you should first check your server system model. For example, MS-NT, IBM-LAN server, and so on. Then choose the correct driver to install in your panel PC. The installation procedures for various servers can be found on the disk labeled: "RTL 8139A Driver #2".

5.2.2 Installation for Windows 95

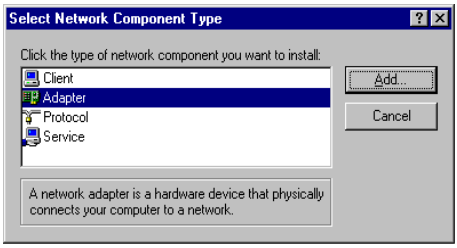
1. a. Select "Start", "Settings", "Control Panel".
   b. Double click "Network".



2. a. Click "Add" and prepare to install network functions.



3. a. Select the "Adapter" item to add the Ethernet card.



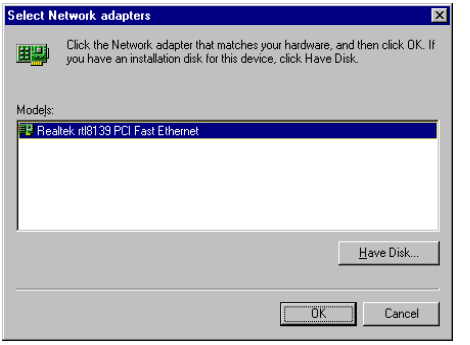
4. a. Click "Have Disk" to install the driver.

5.

a. Insert the disc labeled "RTL 8139A Driver #2" into drive A:.
b. Fill in the correct path.
c. Click "OK".

6.

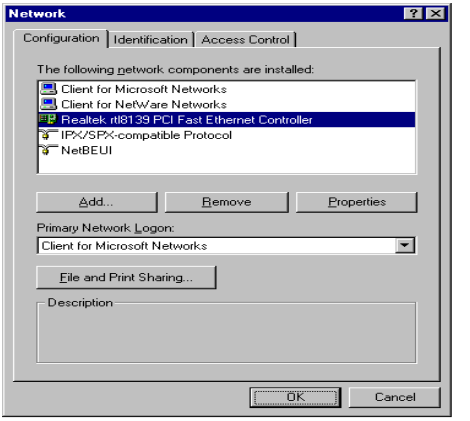
a. Choose the "Realtek" item.
b. Click "OK".



7.

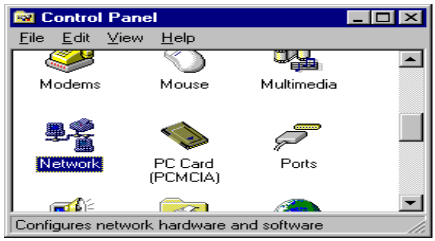
a. Make sure the configurations of relative items are set correctly.
b. Click "OK" to reboot.

END

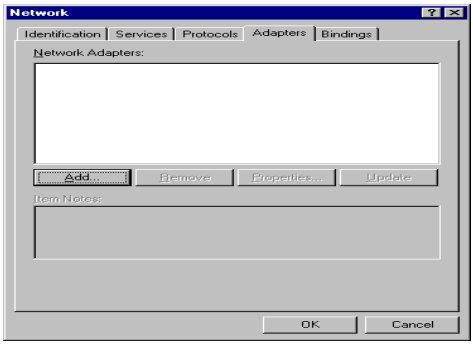


5.2.3 Installation for Windows NT

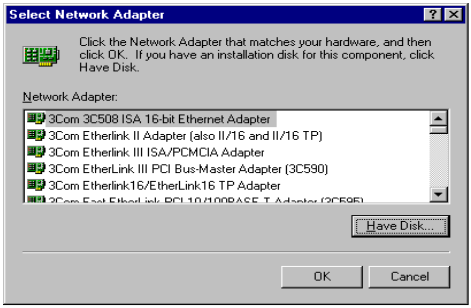
1. a. Select "Start", "Settings", "Control Panel".
   b. Double click "Network".



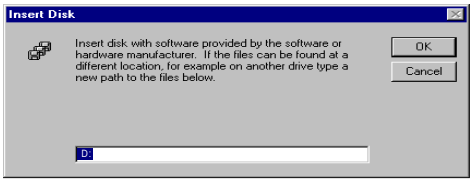
2. a. Choose the "Adapters" label.
   b. Click the "Add" button.



3. a. Press "Have Disk".



4. a. Type "D:".
   b. Press "OK".

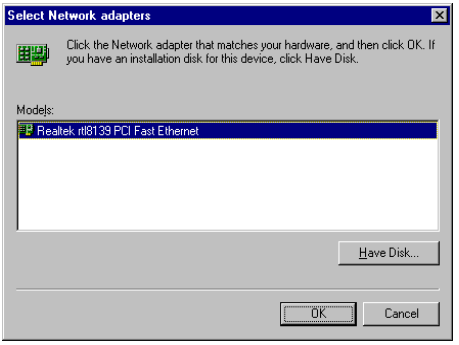


5.

a. Insert the disc labeled "RTL 8139A Driver #2" into drive A:.
b. Fill in the correct path.
c. Click "OK".

6.

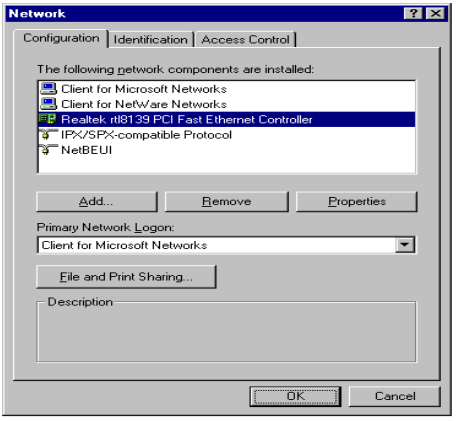
a. Choose the "Realtek" item.
b. Click "OK".



7.

a. Make sure the configurations of relative items are set correctly.
b. Click "OK" to reboot.

END



5.3 Further information

Realtek website: **www.realtek.com**

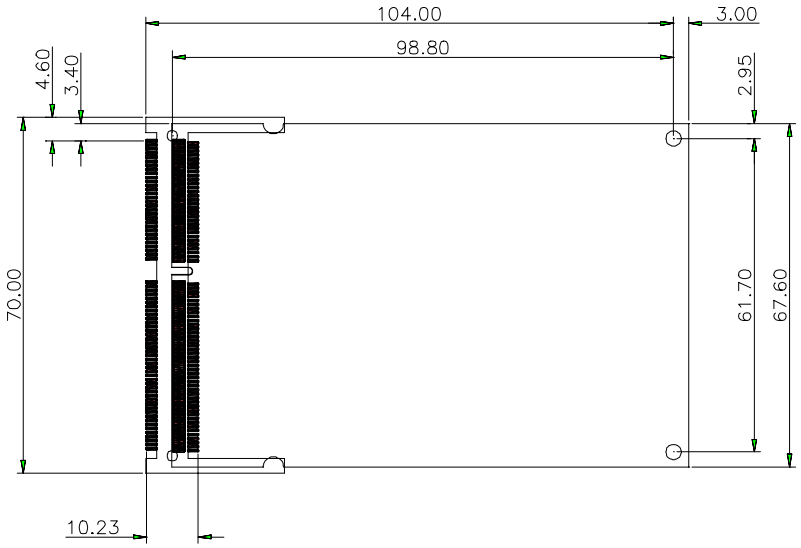
Advantech websites: **www.advantech.com**
www.advantech.com.tw

CHAPTER 6

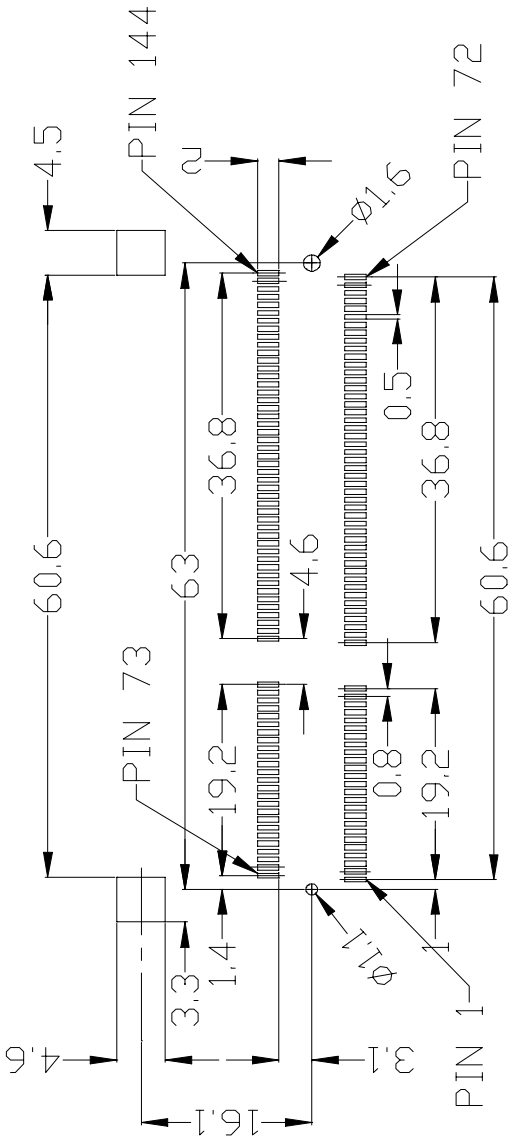
Board Diagrams

This chapter shows diagrams of the CPC-2245's carrier board. It includes specifications for the FPC cable, SODIMM socket, and mechanical diagrams.

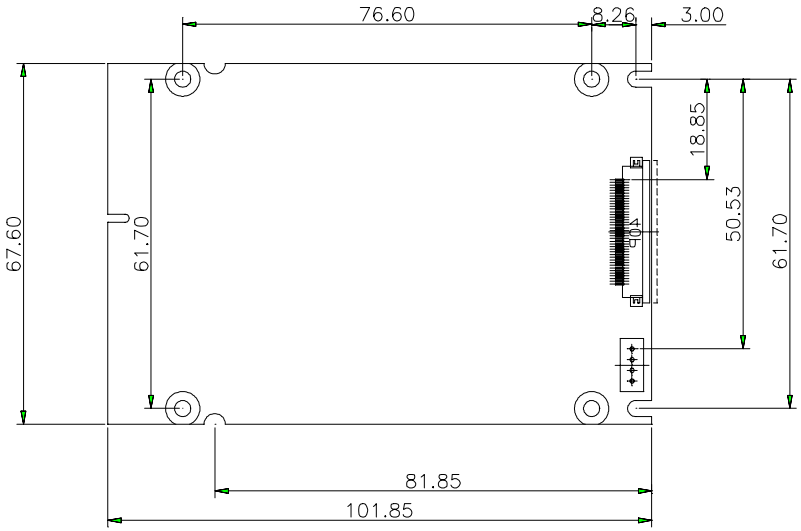
6.1 Board layout: SODIMM and screw hole locations



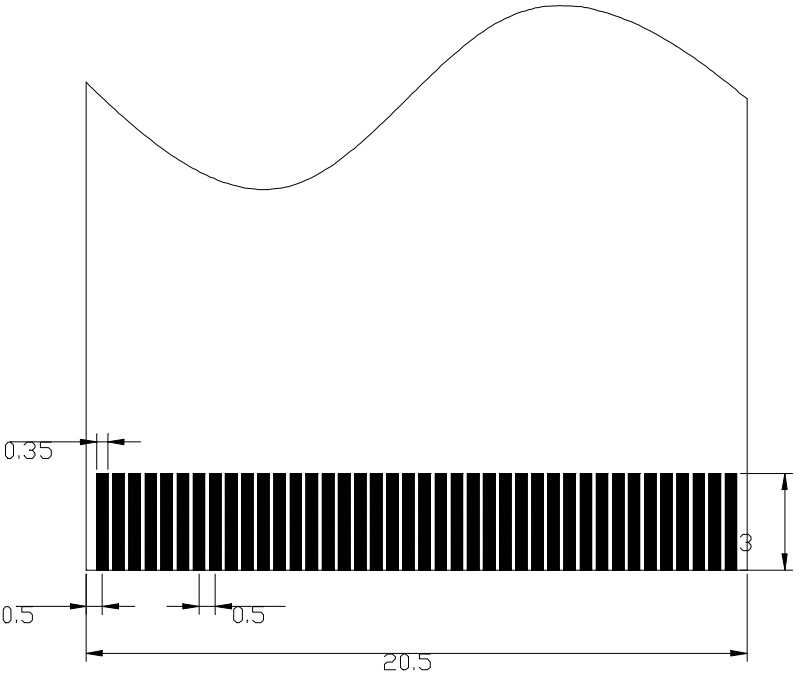
6.2 PCB layout: SODIMM mounting side



6.3 Board layout: FPC connector (CN4)

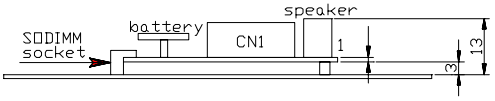


6.4 FPC/FFC cable layout: (CN4; 40-pin FPC connector)



6.5 Height limits (side view)

*1: At least 3.0 mm height is needed between the carrier board's surface and the bottom of CPC-2245.Therefore, SODIMM socket must meet this requirement. Some suggested suppliers are listed below.

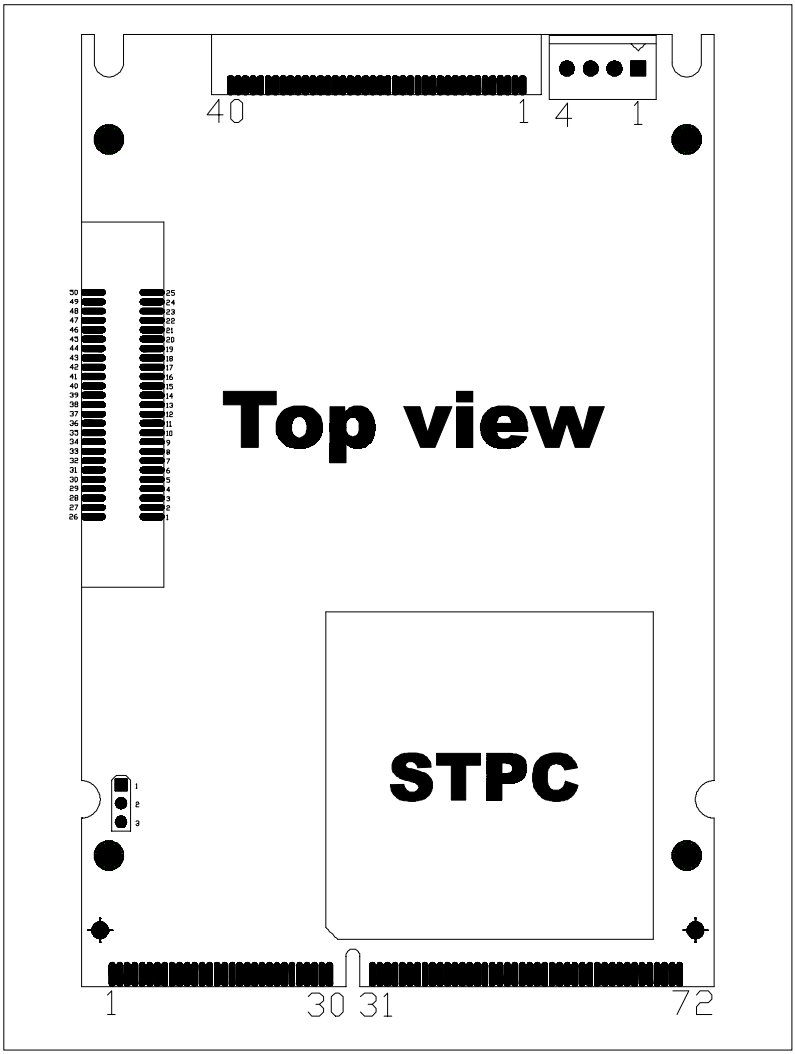


6.6 Component suppliers

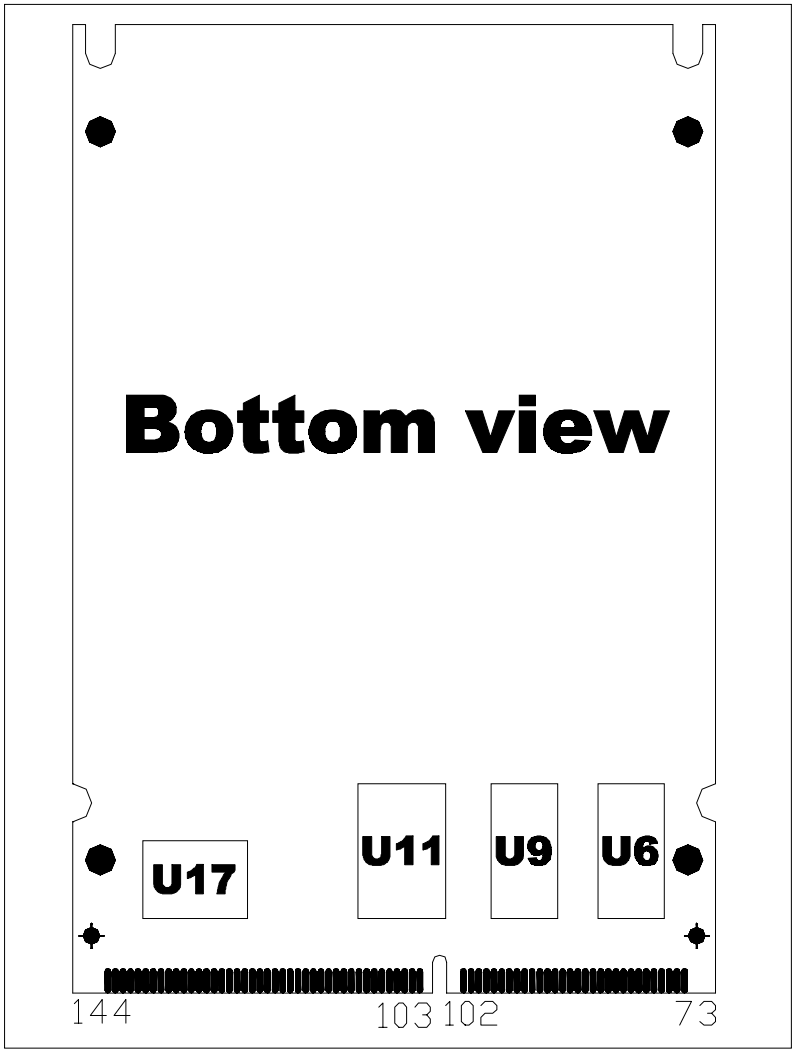
Location	Model number	Supplier
CN3 SODIMM socket	C-390112	AMP
CN4 40-pin FPC connector	IL-FPR-40S-HF	JAE
CN1 50-pin PCI connector	245077050112861	ELCO

* Advantech's part number for the CN3 SODIMM socket is 1651500002.

6.7 SODIMM gold fingers (top view)



6.8 SODIMM gold fingers (bottom view)



APPENDIX A

System Assignments

This appendix contains information of a detailed or specialized nature. It includes:

- System I/O ports
- DMA channel assignments
- Interrupt assignments
- 1st MB memory map

A.1 System I/O ports

Table A-1: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register,
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port 2 (LPT 3)
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT 2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

A.2 DMA channel assignments

Table A-2: DMA channel assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

A.3 Interrupt assignments

Table A-3: Interrupt assignments

Interrupt#	Interrupt source
IRQ 0	nterval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 8	Real-time clock
IRQ 12	PS/2 mouse (non-releasable)
IRQ 13	INT from co-processor
IRQ 14	Fixed disk controller (Primary)
IRQ 15	Fixed disk controller (Secondary)
IRQ 3	Serial communication port 2
IRQ 4	Serial communication port 1
IRQ 6	Diskette controller (FDC)
IRQ 7	Parallel port 1 (print port)

Note: The Ethernet function is auto-sensing.

A.4 1st MB memory map

Table A-4: 1st MB memory map

Addr. range (Hex)	Device
F000h - FFFFh	System ROM
C800h - EFFFh	System ROM
C000h - C7FFh	Expansion ROM
B800h - BFFFh	CGA/EGA/VGA text
B000h - B7FFh	Unused
A000h - AFFFh	EGA/VGA graphics
0000h - 9FFFh	Base memory