

Technical Documentation

Simtec EB7500ATX Series Motherboards

Internal Pinout and Link Settings

Simtec Technical document EB7500ATX/2

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Internal front panel connectors:

PL6 Speaker

Mono Speaker connector capable of driving 1.1W in an 8 Ohm load. Speaker volume can be set by adjusting the trimmer R163. Anti-clockwise increases volume, clockwise decreases volume.

Pin	Function
1	speaker+
2	speaker-
3	speaker+
4	speaker-

PL24 IRDA - infra red serial port

Encoded IRDA serial connector

Pin	Function	Comment
1	Vcc	+5V supply
2	FIR	output (only with SMSC37C669FR fitted)
3	IRRX	input
4	GND	Ground
5	IRTX	output
6	XCVR/OFF	output

PL19 LED and LK - Power state LED and keyboard lock

Pins 1,2,3.

Front panel LED driven by power management controller. When the computer is in standby this LED will flash to indicate that mains power is still connected. The exact rate and pattern of the flashes can be configured. When the unit is on, the LED will be lit constantly.

Pins 4,5.

If a keyswitch is connected to these two pins, the Keyboard lock (LK) will completely disable both keyboard and mouse inputs. When the keyswitch is closed input will be disabled. When open, or when no switch is fitted, keyboard and mouse input will be enabled as normal.

Pin	Function	
1	LED+)
2	NC) LED
3	LED-)
4	Key Lock	input) LK
5	GND)

LK4 PWR - Soft Power on switch

When the computer is in “standby”, a momentary closure on the power switch connected between these pins will turn on the mains power. If it is pressed again, it will signal the computer to perform a system shutdown, turn off the power and enter it’s standby mode. If for some reason the system refuses to shut down automatically, holding the button continuously for four seconds will force the power to be turned off.

Pin	Function
1	Power on switch input
2	GND

LK3 HD - Hard disk and network activity LED

When a LED is connected to these pins, it will light when either on of the connected IDE devices is being accessed or when a network packet addressed to the computer has been received.

Pin	Function
1	LED+
2	LED-

LK5 RST - System reset button

The system reset button should be connected to these pins. When pressed, it will force the machine to reset and all data and programmes currently held in RAM will be lost. It should only be used on the rare occasions when the computer ceases to respond and escape, <ALT><BREAK> or <CTRL><BREAK> don’t work.

Pin	Function
1	Reset input
2	GND

LK9 WAKE - Remote Wake-on-lan connector

This connector is used to power an expansion card when main power is off and the system is in standby mode. If enabled in the power management setup, a positive going signal on the wake-up pin will power on the machine.

Pin	Function
1	+5V supply
2	GND
3	Wake-up input

LK11 VARFAN - Programmable 12V FAN

This connector can be used to power a small 12V FAN that draws less than 250mA. The speed can be controlled by software using the power monitor. The connector also has a TACHO input so that fans that support it can be monitored to verify rotational speed or to detect a rotor stall.

Pin	Function
1	GND
2	+FAN supply (0-10V)
3	Open collector TACHO input input/OC

LK6 12V FAN - unfused 12V supply for additional FAN

Pin	Function
1	GND
2	+12V supply
3	NC

LK1,2,17,18

These are for manufacturing and test only and should not be altered. **Do not fit any jumper caps to these pins.**

PL22 System ID bits

These pins may be populated by link caps and their state can be read back by software. These pins are not currently used. Fitting a link cap between a pair of pins will cause a logic zero to be read back for the corresponding bit position. When no cap is fitted, a logic "1" is returned.

Pin	Function	
1-2	VID0	
3-4	VID1	
5-6	VID2	
7-8	VID3 - Keyboard Fuse blown	*DO NOT FIT LINK*
9-10	VID4 - Joystick Fuse blown	*DO NOT FIT LINK*

PL12 CMOS protect and ROM size select

This setting of the link caps between pins 1-2 and 3-4 set the size of each ROM bank. The **RED** cap on on pins 5-6 is used to prevents CMOS RAM from being cleared by a holding <DELETE> or "R" on power on. When this link is removed, the CMOS is protected.

Pin	Function
1-2	ROMSEL 0
3-4	ROMSEL 1
5-6	ROMSEL 3 - CMOS protection

The size and type of ROMs can be set according to the link table below:

ROMSEL 1	ROMSEL 0	Setting
Fitted	Fitted	Bank0=16Mb/Bank1=16Mb - Bank 0 used to boot processor
Fitted	NF	Bank1=16Mb/Bank0=16Mb - Bank 0 and 1 swapped
NF	Fitted	Bank0=32Mb/Bank1 disabled
NF	NF	Bank1=32Mb/Bank0 disabled

ROMSEL1 and ROMSEL2 should not need to be changed. The machine will not work correctly if they are inappropriately set. *Default, all links are fitted.

LK10 OWB - One wire bus/Dallas ID socket

This socket accepts a Dallas serial number device and can be used to replace the machine's default serial number.

Pin	Function
1	GND
2	One wire signal bus in/out
3	+5V supply fed by 22 Ohm protection resistor

LK7,13 SERIAL/MIDI - selects between Serial 2 and MIDI 2

These links route the second UART signals of the SuperIO device to either the second serial connector (PL21) for a second serial port or to the second joystick port (PL2) for a second MIDI port.

By default, the signals are set for serial mode. The jumper cap positions for each mode for LK7 and LK13 are as follows:

Pin	Function
1-2, 1-2	SERIAL mode to second serial port
2-3, 2-3	MIDI mode to second midi port

PL4 AUX BAT/RAM CLR - CMOS RAM clear link and auxiliary battery connector

If enabled by software, the CMOS RAM may be cleared by moving the link cap from its parking position, pin 2-3 to position 3-4 while power is on. The cap should then be returned to its parking position after the RAM has been reset.

The header also serves as a connector for an standard 4.5v auxiliary battery pack which can be used to maintain the CMOS RAM and Realtime clock if the internal cell finally discharges after ten years of use. As replacing the RTC module may stop some protected software from running if a specific machine serial number is expected, an external battery should be used.

Pin	Function
1	+3.5-4.5v aux battery supply
2	NC) Parking position for
3	CMOS RAM clear (in)) RAM clear jumper cap
4	GND

PL2 JOYSTICK - secondary joystick connector

This second joystick port is connected to the 7500FE's analogue inputs and is completely independent of the external port. It can also provide an additional MIDI channel if LK7 and 13 are set appropriately.

Pin	Function
1	+5V supply (250mA fused)
2	+5V supply
3	JAB1 - Joystick A, button 1
4	JBB1 - Joystick B, button 1
5	JACX - Joystick A, x-axis
6	JBCX - Joystick B, x-axis
7	GND
8	MIDI_TX - Midi out
9	GND
10	JBCY - Joystick B, y-axis
11	JACY - Joystick A, y-axis
12	JBB2 - Joystick B, button 2
13	JAB2 - Joystick A, button 2
14	MIDI_RX - Midi in
15	+5V supply
16	NC

PL9 IIC - IIC serial communication bus

The IIC serial bus is a two wire synchronous serial bus devised by Philips Components as an efficient way to connect multiple low speed devices to a CPU. RISC OS' IIC bus brought out to a four pin header, providing power, clock, data and ground. Both clock and data signals have ESD clamp diodes to protect the inputs from excessive static discharge. For information on how to use the IIC bus, read the RISC OS programmers ref. manuals and consult the current IIC standard from Philips Semiconductors.

Pin	Function
1	+5V Supply
2	IIC Data in/out
3	IIC Clock in/out
4	GND

PL5 VOLUME - digital volume control

When a multimedia switch panel is connected to the digital volume port, the master volume of the sound system can be increased, decreased or muted by pressing the appropriate button which connects it's signal to ground. Holding a button down will continue to increase/decrease the volume until released or the maximum or minimum is reached.

Pin	Function
1	MUTE
2	UP
3	DOWN
4	GND

PL8,11 CD AUDIO

These two connectors are wired together to enable the sound output of a CD drive to be mixed with the internal sound so it can be fed through the speaker and LINE OUT. Two types are supported so that all common CD audio cables can be used. Use the connector that matches the pitch and wiring of your CD's cable.

As both sockets are wired together, only one socket should be used at any one time. **Do not connect a second drive to the other socket or damage to the device will occur.** Use the separate AUX AUDIO connector PL7 for an additional sound input (*SEE PL7 AUX AUDIO over restrictions if a wavetable card is fitted)

PL8 0.1 inch pitch CD audio connector

Pin	Function
1	Left Audio
2	GND
3	GND
4	Right Audio

PL11 2mm pitch CD audio connector

Pin	Function
1	Left Audio
2	GND
3	Right Audio
4	GND

- PL14 WAVETABLE EXPANSION - Wavetable connector
- PL7 AUX AUDIO - additional audio mixer input
- PL13 DSP - serial audio DSP interface

This connector will take a standard MIDI synth board. It feeds both power and the MIDI-out stream to the synth and routes its audio output through the sound mixer. If the wavetable connector is not used then the AUX AUDIO connector PL7 may be used as a second CD mixer input. The AUX AUDIO connector PL7 has the same pinout as PL8. PL13 is a serial audio link to the Audio codec. It should not be used.

LK14 DDC/12V - Monitor hardware configuration link

This link routes either a serial signal to the monitor to support the DDC "plug and play" protocol between the computer and an attached monitor, or routes a high impedance 10V to pin 12 of the video connector as previous Acorn RISC OS computers did. Unless this old behaviour is essential, it is recommended that the link be configured for DDC mode.

Pin	Function
1-2	High voltage signalling
2-3	DDC mode *DEFAULT*

PL21 SERIAL2 - second serial port

This header presents a fully buffered second serial port which is identical in function to the external port. To use this port requires a suitable block driver and that the SER/MIDI links (LK7,13) have their jumpers set to link pins 1-2.

Pin	Function	
1	DCD	in
2	RX	in
3	TX	out
4	DTR	out
5	GND	
6	DSR	in
7	RTS	out
8	CTS	in
9	RI	in
10	NC	

As with the external serial port, an active (positive) signal will trigger a wake-up serial event. If enabled and the machine is in standby, the power management unit will automatically switch on the machine.

PL25 Genlock

This 2mm pitch connector is compatible with previous RISC OS computers and provides the required signals to support Video Genlock or to drive an LCD display.

Pin	Function		
1	HSYNC	out	horizontal sync
2	VSYNC	out	vertical/composite sync
3	SYNCH	in	vertical synchronization input
4	GND		
5	HCLK	in	alternate pixel clock
6	ECLK	out	pixel clock
7	GND		
8	ED(0)	out	digital pixel data
9	ED(1)	out	
10	ED(2)	out	
11	ED(3)	out	
12	ED(4)	out	
13	ED(5)	out	
14	ED(6)	out	
15	ED(7)	out	
16	GND		

LK8,12,15,16,19 ROM select links

These should not be altered at any time unless instructed by your supplier. The jumper default settings are:

LK8 Pin 1-2

LK16 Pin 1-2

All other links in this group have no jumper caps fitted.

PL17,16**PRIMARY/SECONDARY - EIDE interface connectors**

The two connectors provide a standard IDE interface capable of supporting up to two devices (a master/slave pair) on each socket. Cables should be no longer than 75cm in length and be fitted to each socket so that the pin 1 markings match. The use of "bump" polarized connectors will help in this alignment. If for any reason the cable is reversed, an error message warning of an IDE bus fault will be given when the machine is next powered on and the interface is disabled. Both connectors have the following connections:

Pin	Function	
1	*RESET	out/OC
2	GND	
3	D(7)	in/out
4	D(8)	in/out
5	D(6)	in/out
6	D(9)	in/out
7	D(5)	in/out
8	D(10)	in/out
9	D(4)	in/out
10	D(11)	in/out
11	D(3)	in/out
12	D(12)	in/out
13	D(2)	in/out
14	D(13)	in/out
15	D(1)	in/out
16	D(14)	in/out
17	D(0)	in/out
18	D(15)	in/out
19	GND	
20	NC	
21	NC	
22	GND	
23	*IOW	out
24	GND	
25	*IOR	out
26	GND	
27	IORDY	OC
28	Cable select (390 Ohm to GND)	
29	NC	
30	GND	
31	IRQ	in
32	*IOCS16	OC
33	A(1)	out
34	*PDIAG	in/out
35	A(0)	out
36	A(2)	out
37	*CS(0)	out
38	*CS(1)	out
39	*DASP	in/out
40	GND	

Signals prefixed with "" indicate negative going logic.

PL15 FLOPPY - dual floppy disk interface

The FLOPPY connector will support up to two standard PC floppy disk drives with a suitably twisted “swap-over” cable. Single drives can be connected using either a straight or swap-over cable. Drives of a type used in previous RiscOS machines may be used but care should be taken when connecting them to make sure that the drive is set to DRIVE “B” or “1”.

It is always good practice to ensure the correct media is used in the drives, ie 2Mb HD disks used for 1.6 or 1.44Mb formats and 1Mb DD disks for 800K or 720K formats. Failure to do so may mean that your disc may not be read correctly on another machine especially if transferring files between a RISC OS machine and a PC.

Pin	Function	
2	DENSITYSEL	in/out
4	NC	
6	DRATE	in/out
8	INDEX	in
10	MTR0	out
12	DRIVE1	out
14	DRIVE0	out
16	MTR1	out
18	DIRECTION	out
20	STEP	in
22	WriteDATA	out
24	WriteGATE	out
26	TRACK0	in
28	WritePROTECT	in
30	ReadDATA	in
32	SIDE1	out
34	DiscCHANGED	in

All odd pins are connected to GND

PL3 ATX POWER - power feed from ATX PSU

A standard ATX power supply is used to feed the motherboard. Because of the board's low power consumption, it is recommended that a PSU of no more than 145W is used or a sufficient load on it's output be guaranteed to keep the outputs of the PSU stable.

Caution!

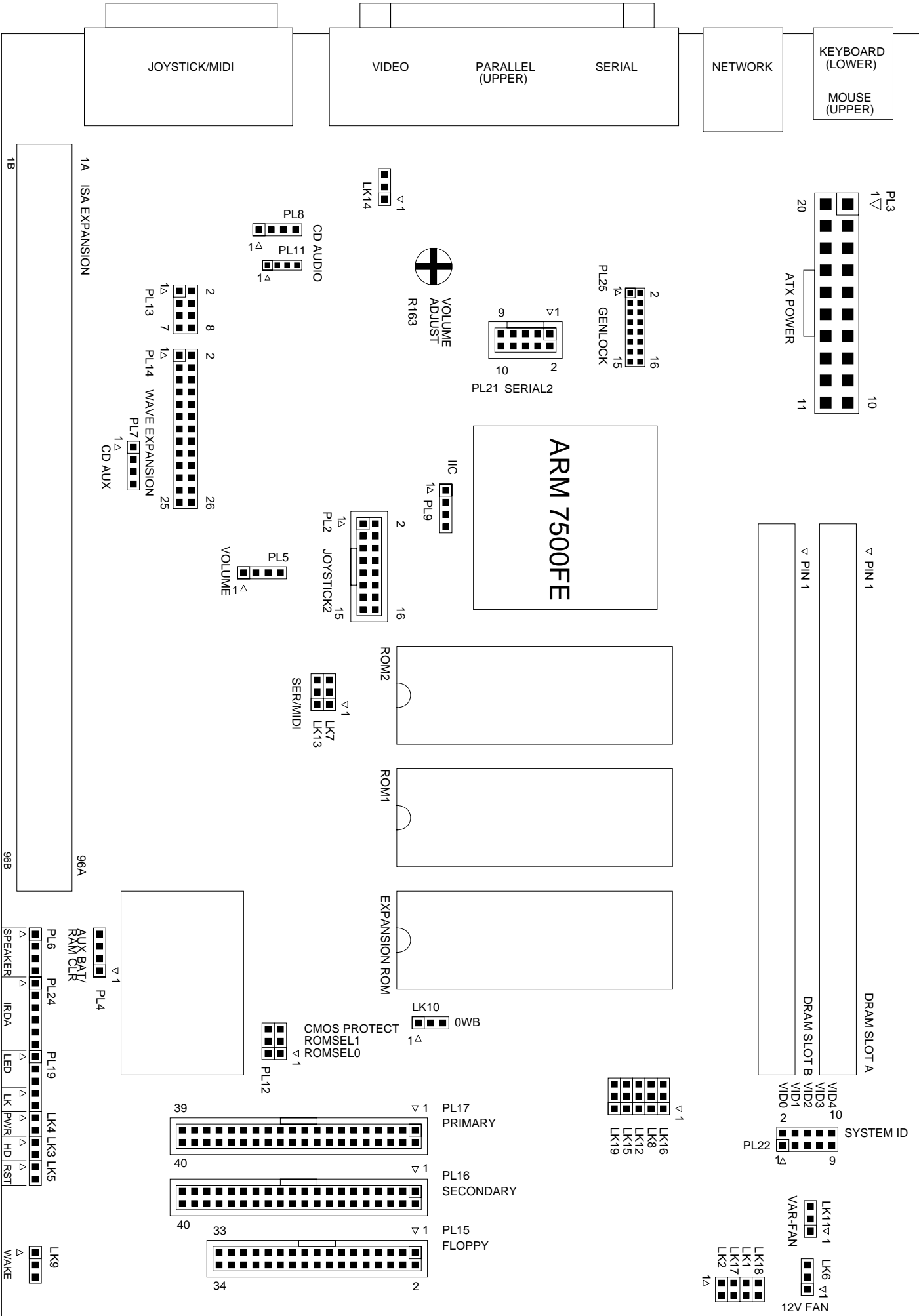
As the motherboard is powered continuously by the standby power supply of the PSU, before any work or upgrading is done on the motherboard, the PSU **should be disconnected from the mains** and allowed to discharge fully first. This may vary with the type of PSU used and **can take up to 30 seconds**. When discharged, the POWER LED will cease to flash.

Pin	Function
1	NC
2	NC
3	GND
4	+5V
5	GND
6	+5V
7	GND
8	DC OK
9	+5V standby
10	+12V
11	NC
12	-12V
13	GND
14	*PSU Enable
15	GND
16	GND
17	GND
18	-5V
19	+5V
20	+5V

The motherboard requires the following supplies:

Voltage	Current
+5V	1A
+5V Standby	150mA to 800mA (dependant on mouse/keyboard consumption)
-5V	0 to 500mA (used for ISA bus only)
+12V	100mA (used for serial and clean audio supply)
-12V	20mA (used for serial drivers)

These ratings must be increased if expansion cards are fitted.

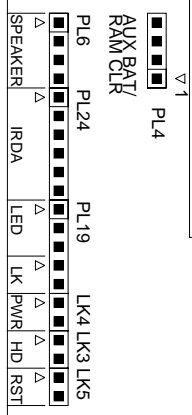
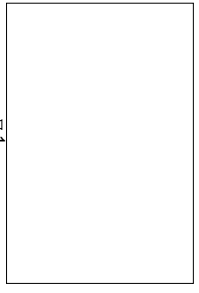
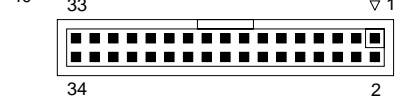
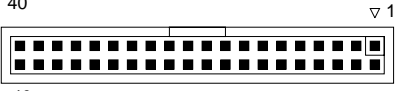
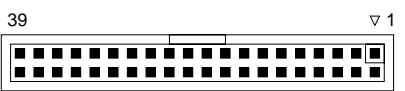
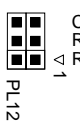
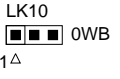
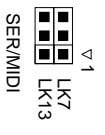
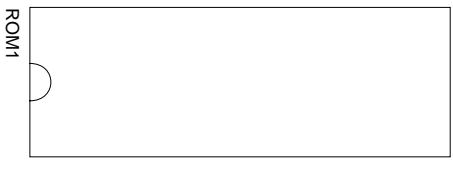
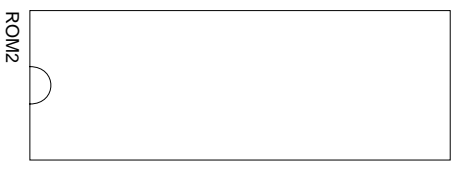
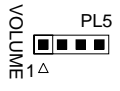
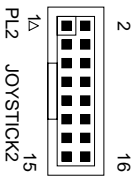
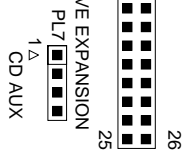
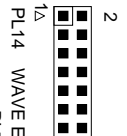
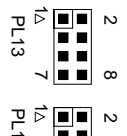
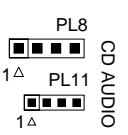
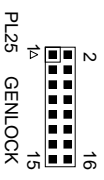
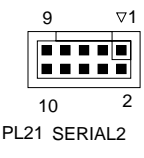
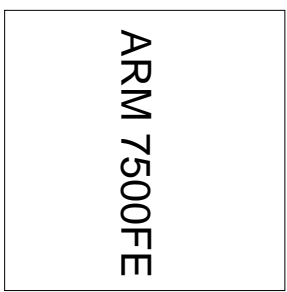
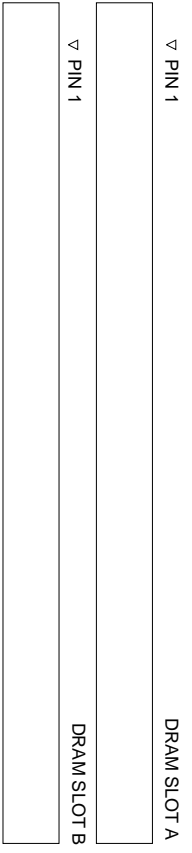
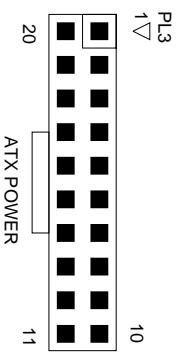


KEYBOARD (LOWER)
MOUSE (UPPER)

NETWORK

VIDEO
PARALLEL (UPPER)
SERIAL

JOYSTICK/MIDI



1A ISA EXPANSION

1B

96A

96B