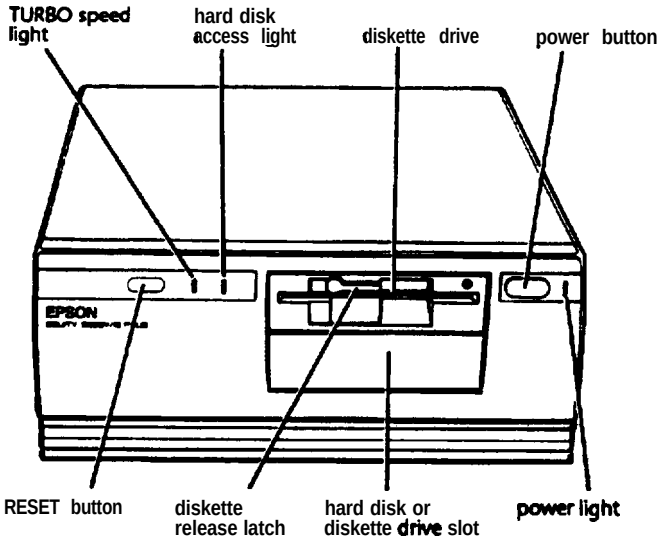
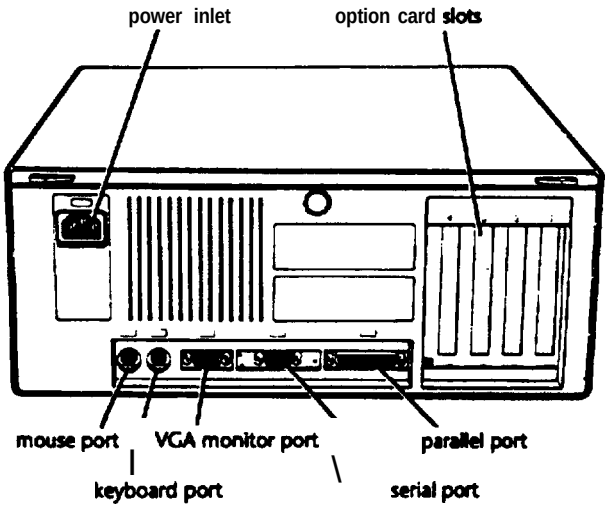




Computer Specifications

CPU and Memory

16-bit CPU	80386SX microprocessor, 20 MHz system clock speed, 20 MHz or 10 MHz processor speed; user selectable
	0 wait state memory access speed at 20 MHz
System memory	2MB RAM standard; expandable using 256KB, 1MB, or 4MB SIMMs up to 24MB (the first 16MB can be extended or expanded memory; above 16MB can be only expanded memory); SIMM access speed must be 80ns or faster
ROM	128KB (system BIOS and VGA BIOS)
Shadow RAM	0 wait state access speed; system ROM BIOS and video ROM can be copied into RAM through SETUP
Math coprocessor	80387SX, 20 MHz support; optional
Clock/calendar	Real-time clock, calendar, and CMOS RAM for configuration; battery backup
Battery	Replaceable, 3.6V lithium; 3-5 year life

Controllers

Diskette	supports up to two drives in any of four formats: 5¼inch, high-density, 1.2MB; 5¼-inch, double-density, 360KB; 3½inch, highdensity, 1.44MB; 3½-inch, double-density, 720KB; controller on main system board
Hard disk	Supports up to two drives; embedded IDE; interface on main system board

Interfaces

Monitor	Standard VGA with 256KB of video memory; supports up to 800 x 600 pixels in 16-color or Bray scale mode; 15-pin, D-shell connector
Serial	RS-232C, programmable, asynchronous; 9-pin, D-shell connector
Parallel	Standard 8-bit parallel, mono-directional; 25-pin, D-shell connector
Mouse	Mini DIN, 6-pin connector for PS/2 compatible mouse or other device
Keyboard	Mini DIN, 6-pin connector for PS/2 compatible keyboard
option slots	Four standard input/output expansion slots (three 16-bit ISA compatible and one 8-bit ISA compatible); 8 MHz bus speed
Speaker	Internal, programmable

Power Supply

Type	145W, fan-cooled
Input ranges	98-132 VAC and 195-264 VAC, 47 Hz to 63 Hz
Maximumoutputs	+5 VDC at 18 Amps, +12 VDC at 4.2 Amps -12 VDC at 0.3 Amps, -5 VDC at 0.3 Amps

Mass Storage

	Three half-height drives maximum (one vertical mount and two horizontal mounts) configurable using the following drive types:
Diskette drives	5¼-inch diskette drive, 1.2MB (high-density) storage capacity
	3½-inch diskette drive, 1.44MB (highdensity) storage capacity

	5¼-inch diskette drive, 360KB (double-density) storage capacity
	3½-inch diskette drive, 720KB (double-density) storage capacity
Hard disk drives	3½-inch form factor hard disk drive(s), up to half height size; the first mounted vertically, second mounted horizontally
Other devices	Half-height tape drive, CDROM, or other storage device; 5¼-inch form factor or 3½-inch with 5¼-inch mounting frames

Keyboard

	Detachable, two position; 101 sculpted keys
Layout	58-key QWERTY main keyboard; 17-key numeric/cursor pad; 10 cursor keys; additional 4-key cursor pad; 16 function keys (user-definable)
Function	Four levels (normal, shift, control, alternate); user-definable

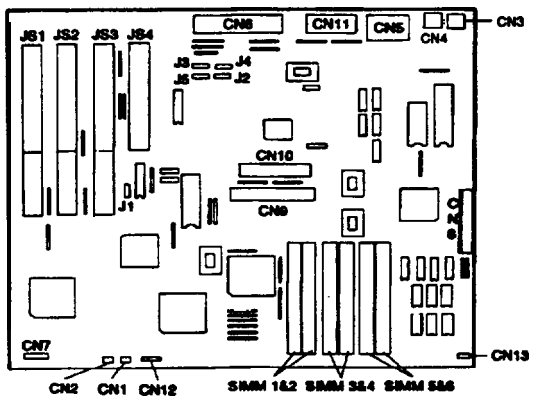
Environmental Requirements

Condition	Operating range	Non-operating range	Storage range
Temperature	41° to 95° F (5" to 35° C)	–4° to 140° F (–20° to 60° C)	–40° to 140° F (–40° to 60° C)
Humidity (non-condensing)	20% to 80%	10% to 90%	5% to 95%
Altitude	–330 to 9900 ft (–100 to 3000 m)	–330 to 11880 ft (–100 to 3600 m)	–330 to 39600 ft (–100 to 12000 m)
Maximum wet bulb	68° F (20° C)	104° F (40° C)	134° F (57° C)

Physical Characteristics

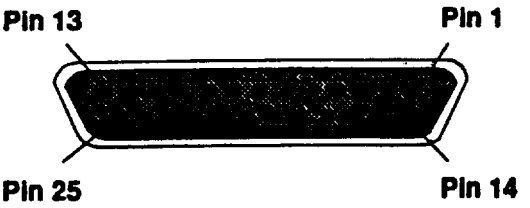
Width	14.75 inches (375 mm)
Depth	17.5 inches (444 mm)
Height	5.9 inches (150 mm)
Weight	Single diskette drive model without keyboard: 20.6 lb (9.4 kg)

System Board Interface Connectors



Connector Pin Assignments

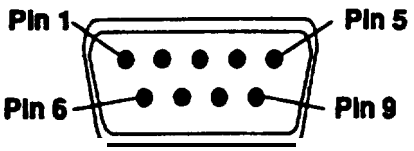
Parallel Port Connector, CN6



Parallel Port *Connector* Pin *Assignments*

Pin	Signal	Pin	Signal	Pin	Signal
1	Strobe	10	ACK	19	Signal GND
2	DATA0	11	BUSY	20	Signal GND
3	DATA1	12	PE	21	Signal GND
4	DATA2	13	SELECT	22	Signal GND
5	DATA3	14	AUTO	23	Signal GND
6	DATA4	15	ERROR	24	Signal GND
7	DATA5	16	INIT	25	Signal GND
8	DATA6	17	SELECTIN		
9	DATA7	18	Signal GND		

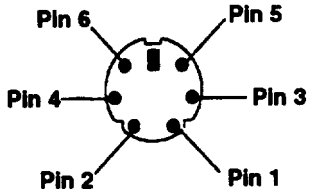
Serial Port Connector, CN11



Serial Port Connector Pin *Assignments*

Pin	Signal	Pin	Signal
1	Data carrier detect	6	Data set ready
2	Receive data	7	Request to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ringindiior
5	Not used		

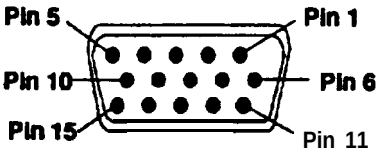
Keyboard and Mouse Connector, CN4 and CN3



Keyboard and Mouse Connector Pin Assignments

Keyboard		Mouse	
Pin	Signal	Pin	Signal
1	Keyboard data	1	Mouse data
2	Reserved	2	*Reserved*
3	Ground	3	Ground
4	+5 VDC	4	+5 VDC
5	Keyboard clock	5	Mouse dock
6	Reserved	6	Reserved

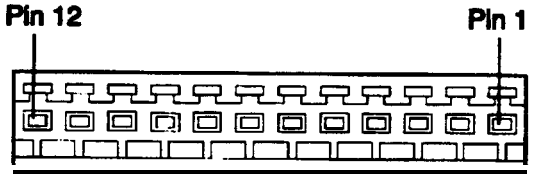
VGA Connector, CN5



VGA Connector Pin Assignments

Pin	Signal	Pin	Signal
1	Red video	9	Key
2	Green video	10	Sync return
3	Blue video	11	Reserved
4	Not used	12	Reserved
5	Ground	13	Horizontal sync
16	Red return	14	Vertical sync
7	Green return	15	Not used
6	Blue return		

Power Supply Connector, CN8



Power Connector Pin Assignments

Pin	Signal	Power Supply Connection
1	POWER GOOD	P4, Pin 1
2	+5 VDC	P4, Pin 2
3	+12 VDC	P4, Pin 3
4	-12 VDC	P4, Pin 4
5	GND	P4, Pin 5
6	GND	P4, Pin 6
7	GND	P5, Pin 1
8	GND	P5, Pin 2
9	-5 VDC	P5, Pin 3
10	+5 VDC	P5, Pin 4
11	+5 VDC	P5, Pin 5
12	+5 VDC	P5, Pin 6

System I/O Address Map

Hex Address	Assigned Device
000-01F	DMA controller 1, 8237A-5
020-03F	Interrupt controller 1, 8259A, Master
040-05F	Timer/counter, 8254-2
060-06F	Keyboard controller, 8742
070-07F	RTC, NMI mask register
080-09F	DMA page registers, 74LS612
092	Reserved by VTI for PS/2 compatibility
094	VGA, 82C452
0A0-0BF	Interrupt controller 2 (8259A-compatible)
0C0-0DF	DMA controller 2 (8237A-5-compatible)
0E8	Reserved by VTI for EMS index register
0E9	Reserved by VTI for EMS active set
0EA	Reserved by VTI for EMS data port low byte
0EB	Reserved by VTI for EMS data port high byte
0EC	Reserved by VTI for index register
0ED	Reserved by VTI for data port register
0EE	Reserved by VTI for fast A20
0EF	Reserved by VTI for fast reset
0F0	Clear math coprocessor busy (80387SX/20)
0F1	Reset math coprocessor (80387SX/20)
0F4	Reserved by VTI for slow CPU
0F5	Reserved by VTI for fast CPU
0F8-0FF	Math coprocessor (80387SX/20)
100-103	VGA, 82C452
1F0-1F8	Hard disk controller, primary
200-207	Game I/O
20C-20D	Reserved
21F	Reserved
278-27F	Parallel winter port 3
2B0-2DF	Alternate enhanced graphics adapter
2E2-2E3	Data acquisition adapter (adapter 0)
2F8-2FF	Serial port 2
300-31F	Prototype card
360-363	PC network (low address)
364-367	Reserved
368-36B	PC network (high &dress)
36C-36F	Reserved
378-37F	Parallel printer port 2
380-38F	SDLC, bisynchronous communication 2
390-393	Cluster
3A0-3AF	Bisynchronous communication 1
3B0-3BF	Monochrome display and printer adapter
3C0-3CF	Enhanced graphics adapter
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Floppy disk drive controller primary
3F8-3FF	Serial port 1
6E2-6E3	Data acquisition (adapter 1)
790-793	Cluster (adapter 1)
AE2-AE3	Data acquisition (adapter 2)
B90-B93	Cluster (adapter 2)
EE0-EE3	Data acquisition (adapter 3)
10ED	Reserved
1390-1393	Cluster (adapter 3)
22E1	GPIB (adapter 1)
2390-2393	Cluster (adapter 4)
42E1	GPIB (adapter 2)
46E8	VGA 82C452
62E1	GPIB (adapter 3)
82E1	GPIB (adapter 4)
83C6-83C9	VGA 82C452
A2E1	GPIB (adapter 5)
C2E1	GPIB (adapter 6)
E2E1	GPIB (adapter 7)

DMA Request Level

Level	Assigned Device
DRQ0 (CTRL1)	Spare
DRQ1 (CTRL1)	SDLC
DRQ2 (CTRL1)	Floppy controller
DRQ3 (CTRL1)	Spare
DRQ4 (CTRL2)	Cascade for CTRL1
DRQ5 (CTRL2)	Spare
DRQ6 (CTRL2)	Spare
DRQ7 (CTRL2)	Spare

Hardware Interrupts

IRQ No.	Function
NMI	Parity or I/O channel check
IRQ00	Timer output 0
IRQ01	Keyboard (output buffer full)
IRQ02	Interrupt from CTRL2 (cascade)
IRQ03	Serial port 2
IRQ04	Serial port 1
IRQ05	Parallel port 2
IRQ06	Floppy disk controller
IRQ07	Parallel port 1
IRQ08	Real-time clock
IRQ09	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Reserved
IRQ13	Coprocessor
IRQ14	IDE HDD controller
IRQ15	Reserved

Jumper Settings

Main System Board Jumper Settings

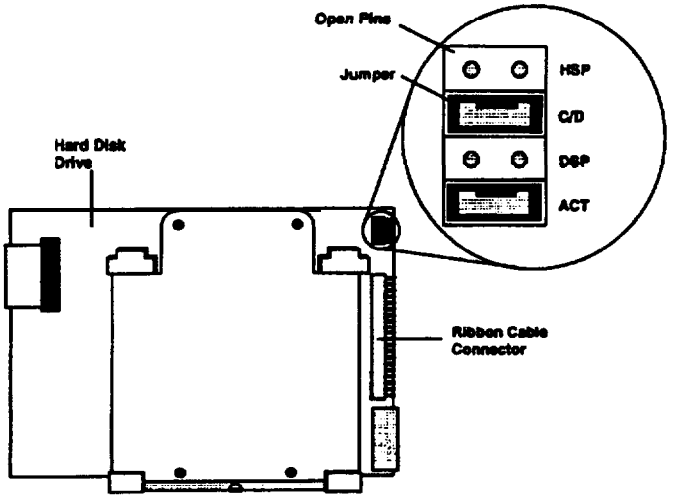
Jumper number	Jumper setting	Function
J1	A	Disables the built-in VGA display adapter so you can use a display adapter on an option card in your computer as your primary adapter
	B*	Enables the built-in VGA d&adapter
J2	A	Disables the password function
	B*	Enables the password function
J3	A*	A color monitor is installed
	B	A monochrome monitor is installed
J4	A'	Enables the built-in mouse connector
	B	Disables the built-in mouse connector so you can use a mouse or other pointing device connected to a port on an option card in your computer
J5	A*	Enables the IRQ9 signal for the built-in VGA display adapter
	B	Enables the the IRQ9 signal for a display adapter on an option card

* Factory settings

IDE HDD Jumper Settings

Jumper positions	One hard disk drive	Two hard disk drives: master	Two hard disk drives: slave
HSP	—	—	
cm	X	X	
DSP	I -	I X	I -
ACT	X	X	X

Xi Jumper in thii position
— = No jump in this position



SIMM Installation

SIMM configuration for the Equity 320sx PLUS

Bank 1 sockets SIMM1	SIMM2	Bank 2 sockets SIMM3	SIMM4	Bank 3 sockets SIMM5	SIMM6	Total Memory
K	K	K	K			3MB
1	1					4MB
1	1	K	K	K	K	5MB
1	1	1	1			6MB
1	1	1	1	1	1	8MB
4	4					10MB
4	4	K	K	K	K	11MB
1	1	4	4			12MB
4	4	4	4			18MB *
1	1	4	4	4	4	20MB *
4	4	4	4	4	4	24MB *†

K = 256KB SIMM M = 1MB SIMM 4 = 4MB SIMM

* If you install this amount of system memory, only 16MB of it can be used as extended memory. Any memory above 16MB must be used as expanded memory.

† If you install 24MB of total memory on SIMMs, the computer disables the 2MB of memory soldered on the main system board.

See "System Board Interface Connectors" above to locate the SIMM sockets.

Hard Disk Drive Types

The following table lists the types of hard disk drives you can use in your computer. Check this table and the documentation supplied with your hard disk to find the correct number for the type of hard disk drive(s) installed in your computer. You need to enter this number when you set the hard disk drive configuration in the SETUP program

Hard disk drive types

Type no.	Cylinders	Heads	Sectors (Sec)	Precomp (WPcom)	Landing zone	Size (in MB)	Drive name
1	306	4	17	128	305	10	
2	615	4	17	300	615	20	ST225, ST4026, WD-93024
3	615	6	17	300	615	31	
4	940	8	17	512	940	62	
5	940	6	17	512	940	47	
6	615	4	17	none	615	20	
7	462	8	17	256	511	31	
8	733	5	17	none	733	30	ST-4038
9	900	15	17	none	901	112	
10	820	3	17	none	820	20	
11	855	5	17	none	855	35	
12	855	7	17	none	855	50	
13	306	8	17	128	319	20	
14	733	7	17	none	733	43	
15							-reserved-
16	612	4	17	0	663	20	
17	977	5	17	300	977	41	CP-3044
18	977	7	17	none	977	57	
19	1024	7	17	512	1023	60	
20	733	5	17	300	732	30	
21	733	7	17	300	732	43	
22	733	5	17	300	733	30	
23	306	4	17	0	336	10	Compatible IBM
24	977	5	17	none	976	41	ST-4051
25	1024	9	17	none	1023	77	ST-4096, CDC-94155
26	980	5	17	none	980	41	CP-3044 translate mode
27	969	10	17	none	969	80	CP-3184 translate mode
28	1224	15	17	none	1223	152	Maxtor 2190
29	683	16	38	none	683	203	CP-3204 default mode
30	832	6	33	none	832	80	CP-3184 default mode
31	482	25	17	none	482	100	CP-3104 UNIX mode
32	925	9	17	none	926	69	CDC-9415
33	981	5	17	none	981	41	Miniscribe 8051A Tran
34	678	36	17	none	678	203	CP-3204 UNIX mode
35	1024	12	17	none	1024	102	
36	1024	14	17	none	1024	119	
37	1024	16	17	none	1024	136	
38	1024	7	35	none	1024	123	HH-2120 (ESDI)
39	1024	5	17	none	1023	43	HH-1050
40	820	6	17	none	820	41	ST-251
41	615	6	17	none	615	31	OPC 30MB
42	754	11	17	128	754	69	Fujitsu 80M (M2243AS)
43	1314	7	17	1314	1314	76	Miniscribe
44	615	6	26	none	615	47	Seagate 40MB
45	820	6	26	544	819	62	
46	642	8	17	128	664	43	NEC D-3142
47	—	—	—	—	—	—	User defined type
60	776	8	33	none	775	100	CP-3104
64	683	16	38	none	683	203	CP-3204

Installation/Support Tips

Mouse and Keyboard

— When attaching the mouse and keyboard connectors, be careful to attach them to the proper connectors. Although they are physically identical, they are not interchangeable.

Installing Floppy Disk Drives

— When installing a floppy disk drive as drive B, remember to set the drive select jumper to the second position and attach the pass-through connector on the floppy drive controller cable to the drive, not to the end connector.

— If the drive does not function normally, make sure that the drive type has been correctly selected in SETUP. Also check that any special drivers that may be necessary have been installed correctly.

Installing Hard Disk Drives

— It is recommended that a 16-bit, AT-type hard disk controller be used in the Equity 320sx PLUS if you are installing a drive that cannot use the internal hard disk controller. Also remember to disable the onboard hard diik controller when installing such a drive.

— If you are having difficulty in formatting the hard disk drive, try starting over with the Format option in diagnostics.

Setup

— When installing a hard disk drive, be sure to consult the drive type tables for the type which fits the drive you are installing. If there is no match for your drive, use the User Definedoption.

Adding Memory Modules

— The total amount of memory must be one of the following: 2MB, 3MB, 4MB, 5MB, 6MB, 8MB, 10MB, 11MB, 12MB, 18MB, 20MB, or 24MB.

— 256KB, 1MB, and 4MB SIMMs can be used. They must be fast-page mode and have an access speed of 80ns or faster.

Software Problems

— When installing a copy-protected software package on the Equity 320sx PLUS, first try the installation at 20MHz. If this does not work properly, try switching to 10MHz for the installation. If you are still unable to load the program at 20MHz, try loading at 10MHz and then switching to 20MHz.

— When using a software package that uses a keydisk as its copy-protection method, try loading it at 20MHz. If this does not work, enable the Auto Speed option in SETUP.

Power-on Password

— If you set a power-on password, make sure you do not forget it. If you do, it will be necessary to disable it by moving jumper J2 on the main circuit board to the A position

Information Reference List

Engineering Change Notices

None.

Technical Information Bulletins

None

Product Support Bulletins

None.

Related Documentation

TM-320SX+	Equity 320sx PLUS Service Manual
PL-320SX+	Equity 320sx PLUS Parts Price List
Y740991001	Equity 320sx PLUS User s Guide
Y740991002	Equity 320sx PLUS VGA Utilities