SNX 460/RS 460/RM SYSTEMA (CONDOR)

CHARACTERISTICS

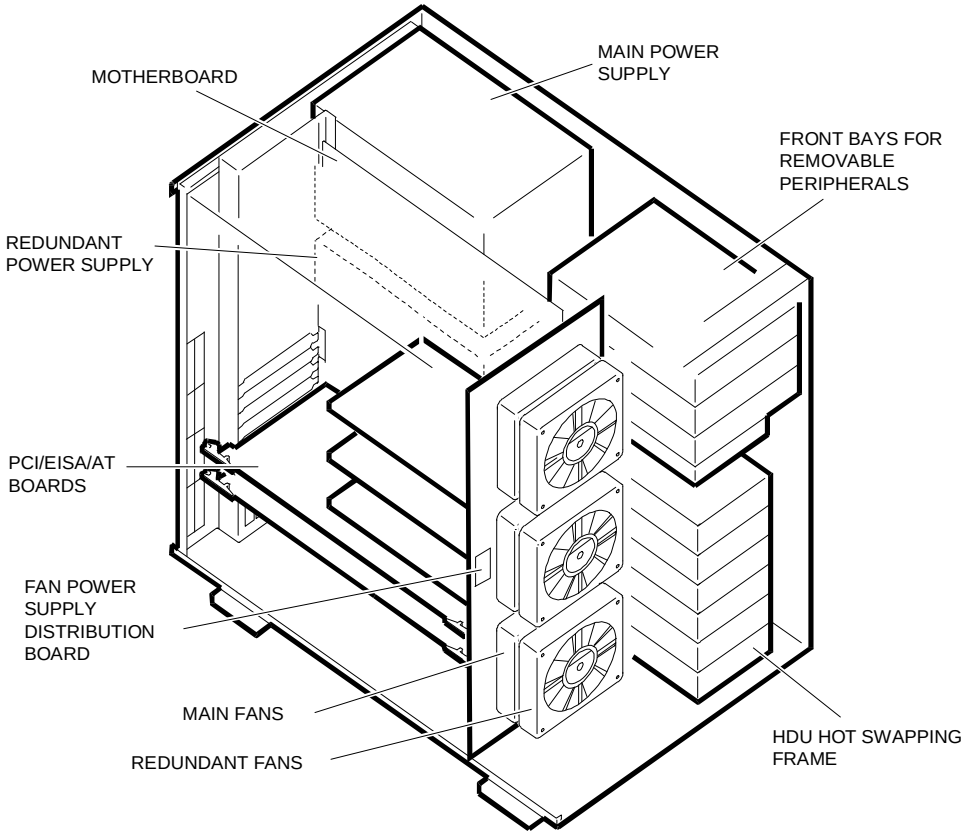
Microprocessor	**SNX 460/RS/RM 166:** 166/66 MHz Intel PENTIUM PRO **SNX 460/RS/RM 200:** 200/66 MHz Intel PENTIUM PRO
Multiprocessor	Up to two CPU boards. Each CPU board can accommodate up to two Pentium PRO processors totalling a maximum of four processors per system
Chipset	Intel Orion
Quad-bus symmetrical SMP architecture	- 64-bit Pentium PRO System Bus (for CPU, memory and PCI bridge boards), peak transfer rate of up to 533 MB/sec - 32-bit primary PCI (Peripheral Component Interconnect), 132 MB/sec - 32-bit secondary PCI (Peripheral Component Interconnect), 132 MB/sec - 32-bit EISA (Extended Industry Standard Architecture), 33 MB/sec
Expansion slots	3 Pentium PRO System Bus, 3 primary PCI, 4 secondary PCI, 3 EISA, 1 dual EISA/PCI
Cache memory	16 KB of primary + 512 KB of second level write back, parity protected, synchronous cache integrated in the Pentium PRO processor
ECC RAM	32 MB to 1 GB (with 3.3 V DIMMs) on the motherboard 32 MB to 2 GB (with 3.3 V DIMMs) with a memory expansion board
Cabinet	**SNX 460/RS:** SILVER Wide box **SNX 460/RM:** 19" RACK Wide box
Video controller	Embedded on the motherboard, SVGA, compatible with the VGA modes
Video memory	1 MB
SAR feature	The Server Automatic Restart (SAR) feature hardware support is provided by the motherboard. Following a system hang caused by hardware or software failures, this feature allows the automatic reset of the system with a successive reboot to render the system available again within a short period of time and without requiring any manual intervention.
Configuration of resilience systems	With the RAID DPT SCSI Wide controller for the HDUs and onboard Lance controller or, for OS/2 and SCO 3.2.4.2, the GO2109 for the removables The specific mechanical structure of the SILVER and RACK cabinets, in association with HDU redundancy (RAID-1 and RAID-5), allows the hot swapping of faulty hard disks and the automatic reconstruction of the data on the new drive.
Configuration of non-resilience systems	With the Lance SCSI Wide controller embedded on the motherboard for HDUs and removables, or an onboard Lance for the HDUs and a GO2109 for the removables In this case, HDU hot swapping is not supported.
Redundant systems	Possiblity of redundant basic module and PEM configurations consisting of two power supplis and two fan assemblies so that if any of the primary modules fail, all system activites can continue as normal.
Disk Duplexing	Feature which consists of dividing the basic module SCSI channel with six HDUs into two separate channels with three HDUs each. Each channel is connected to a dedicated SCSI controller in order to create two mirrored HDU/controller channels. Software support is provided by the O.S.
Peripheral Expansion Module PEM RS/RM Wide	This optional external module can only host HDUs and increases the system's mass storage capacity. The PEM for RS systems derives from the SILVER Wide box, the PEM for RM systems is available in Rack Wide version and can host up to 12 HDUs (twice as much as the system). The PEM Wide can only be connected to the RAID DPT SCSI controller and therefore the HDUs can always be hot swapped. Up to four PEMs can be connected to the system.

Dual Host	Possibility of dual host configurations using the RAID DPT SCSI controller for the management of the HDUs in the PEM. The configuration consists of two basic modules connected to 1 or 2 Wide PEMs; in case and one of the two systems fails, the other can take control of the HDUs shared in the PEM.
Uninterruptible Power Supply	External, battery-equipped, Standard and Rack UPS models are available which provide constant power supply to the system in the event of AC line voltage failures. To safeguard the integrity of the data stored on the hard disks in the event of line voltage failures, resilience systems equipped with the SCSI RAID DPT controller must be have a UPS.

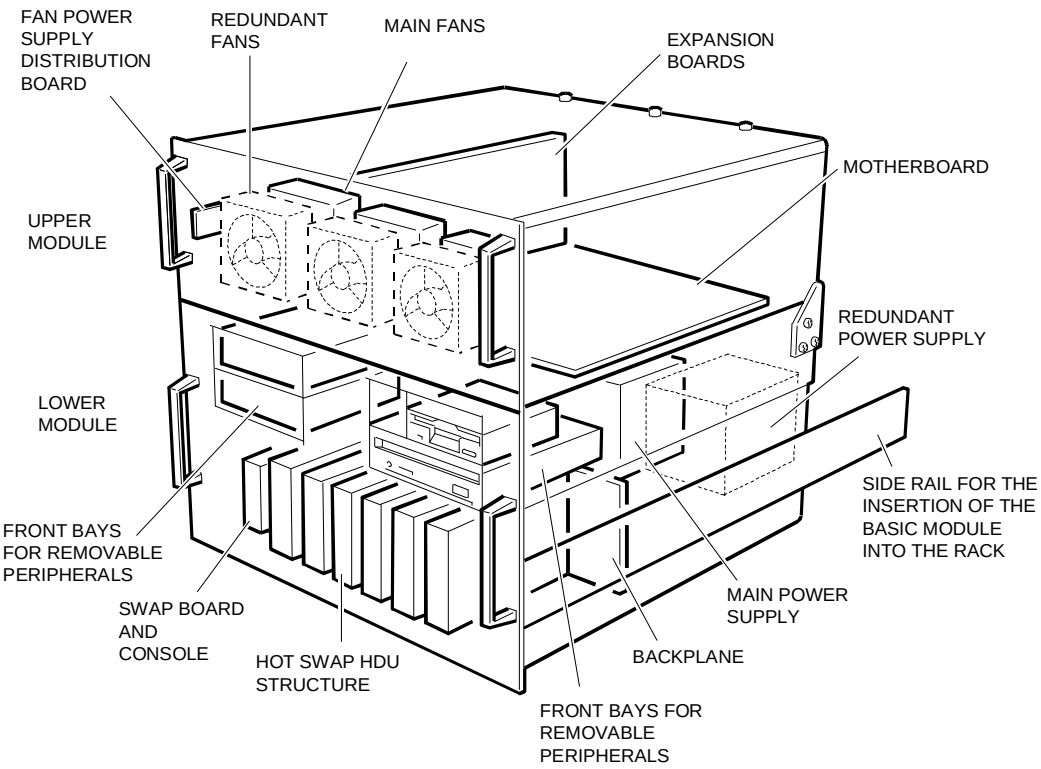
Note: *The systems in a 19" rack differ from those in a Silver box for the possibility of being hosted in a Rack module which also contains other components such as monitor, keyboard, UPS, PEM.*

Note: *The commercial name of the SNX 460/RS Systema and SNX 460/RM Systema remains unchanged for the 166 MHz and 200 MHz versions. For simplicity and whenever necessary, this guide will distinguish between these versions as follows:*
- SNX 460/RS/RM 166 (166 MHz versions)
- SNX 460/RS/RM 200 (200 MHz versions)

SNX 460/RS BASIC MODULE



SNX 460/RM BASIC MODULE



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UPDATE LEVELS OF THE MAIN COMPONENTS ON THE FIRST SERIES SNX 460/RS/RM 166

MOTHERBOARD BA2263 Rev G	**CPU BOARD** GO2065 Rev E	**TERMINATOR CARD** MI2100
BIOS Rev. 1.0	**RAID DPT SCSI CONTROLLER** GO2098 lev. 02 FW F74	**POWER SUPPLY** PS45 lev. 03
CONFIG. ON ORCHESTRA Conf. 0.20, Diagn. 1.0 upd 1	**SYSTEM TEST** Rel. 1.0	

Note: *All the evolutions of the above components are explained in the respective sections further on.*

OPERATING SYSTEMS

	Release Tested with Product Availability	Certific. for Single Proc. Systems	Certific. for Multipro. Systems	Additional SW for Multiproc. Systems	Notes
Windows 95		Yes	No		For single-user, single-task, graphics environments.
Windows NT Server and Service pack 3 / 4	3.51	Yes	Yes	O.S. Included	For network management.
NetWare 4.x	4.1 SMP	Yes	Yes	SMP	For network management. The SMP for symmetrical multiprocessing is on the Orchestra CD-ROM.
UnixWare	2.01	Yes	Yes	O.S. for up to 2 CPUs included. For the 3rd and 4th, Unixware Applic. Server	For multiple-user, multiple-task environments. Unixware Application Server is distributed by Novell.
SCO Unix and SCO Open Server Enterprise	3.2.4.2 3.0.0	Yes	Yes	UOD393C	For multiple-user, multiple-task environments. The UOD 393C patch is distributed by SCO.
SCO Open Server and Supplement release 5.0.0d	5.0	Yes	Yes	O.S. Included	For multiple-user, multiple-task environments. Supplement Release 5.0.0d is distributed by SCO.
OS/2 R2.1 +Fix Pack98 +Lan Server 4.0	2.11 SMP	Yes	Yes		For single-user, multiple-task environments.
OS/2	3.0 (Warp)	Yes	Yes		For single-user, multiple-task environments.

MONITORS

MODEL	DESCRIPTION	SUPPLIER	PDG NAME
MDU 1441/LE	14" VGA low emission positive monochrome monitor. Label: MDU 1441E/PH01	Philips	DSM 26-314/LE
CDU 1448G/LO	14", VGA Plus, SVGA, 0.28 dp, MPR II/PS color monitor	Lite-On	DSM 50-148
CDU 1448G/HY	14", VGA Plus, SVGA, 0.28 dp, MPR II/PS color monitor	Hyundai	DSM 50-149
CDU 1460/MS	14", VGA Plus, SVGA, 0.28 dp, MPR II/ PS/DDC1, 64 KHz, Multifunct. color monitor	Hyundai	DSM 50-144
CDU 1564/MS	15", flat screen, VGA Plus, SVGA, 0.28 dp, MPR II/O.S., FTS, Multisync. color monitor	Hyundai	DSM 50-151
CDU 1786/D	17", flat screen, VGA Plus, SVGA, 0.25 dp, MPR II/PS/DDC1, 82 KHz Diamond, Tron Tub. color monitor	Mitsubishi	DSM 50-175
CDU 1448/MS	14" VGA Plus; SVGA, 0.28 dot pitch, MPR II/PS/DDC, 48 KHz, multifunct. color monitor	Lite-On	DSM 60-400
CDU 1564/OD	15" flat screen, VGA Plus, SVGA, 0.28 dot pitch, MPR II/DCC1, 28/64 KHz	Goldstar	DSM 60-510

KEYBOARD AND MOUSE

PDG	DESCRIPTION
ANK 27-101/N	101-key compact keyboard + cable. Contains the BU's power cord.
ANK 27-102/N	102-key compact keyboard + cable. Contains the BU's power cord.
ANK 27-104	104-key compact keyboard + cable (for Brazil). Contains the BU's power cord.
ANK 28-101	101-key S-compact keyboard + cable. Contains the BU's power cord.
ANK 28-102	102-key S-compact keyboard + cable. Contains the BU's power cord.
ANK 60-104	104-key WIN95 keyboard + cable. Contains the BU's power cord.
ANK 60-105	105-key WIN95 keyboard + cable. Contains the BU's power cord.
GRD 50-S35/3T	Three-button high resolution mouse + management software

Note: *The WIN95 keyboards do not contain the basic module's power cord in their box. This power cord must be ordered separately using code CBL 2307.*

MAGNETIC PERIPHERALS

MODEL	TYPE	INT.	CAP.	SIZE	PDG NAME
Y-E Data YD-702D-6037D Y-E Data YD-702D-6537D Sony MPF520-3 Mitsumi D359T3 Mitsumi D359T5 Epson SMD 1340 P-031	MFD	SA450	1.44 MB	3.5"	Under BU
Wangtek 5150 ES-ACA	STU	SCSI	150/250 MB	5.25" HH	STS 26-150
Wangtek 5525 ES-ACA	STU	SCSI	320/525 MB	5.25" HH	STS 26-321
Wangtek 51000HT (std. front panel) Tandberg TDC4120	STU	SCSI	1/1.2 GB	5.25" HH	STS 1G-95
Hewlett Packard HP C1536A	DAT	SCSI	2/8 GB	3.5"	DAT 4000/S
Hewlett Packard HP C1536A Sony SDT-4000 (with 5.25" bay mechanical adapter)	DAT	SCSI	2/8 GB	3.5"	DAT 4000DDS
Hewlett Packard HP C1533A	DAT	SCSI	4/16 GB	3.5"	DAT DDS2-4G
Hewlett Packard HP C1533A Sony SDT-7000 (with 5.25" bay mechanical adapter)	DAT	SCSI	4/16 GB	3.5"	DAT 8000DDS2
Panasonic CR-504-J (4X) Sony CDU76S-01 (4X)	CD-ROM	SCSI	650 MB	5.25" HH	CDR 4S-500
Panasonic CR-506-B (8X)	CD-ROM	SCSI	650 MB	5.25" HH	CDR 8S-500
Seagate ST31051WC (SCA conn.)	Wide 5400 rpm HDU	SCSI	1.05 GB	3.5" x 1"	HDR 1G
Seagate ST32151WC (SCA conn.)	Wide 5400 rpm HDU	SCSI	2.1 GB	3.5" x 1"	HDR 2G
Seagate ST32550WC (SCA conn.)	Wide 7200 rpm HDU	SCSI	2.1 GB	3.5" x 1"	HDR 2G72
Seagate ST15230WC (SCA conn.)	Wide 5400 rpm HDU	SCSI	4.2 GB	3.5"x 1.6"	HDR 4G
IBM DCAS 34330 (SCA conn.)	Wide 5400 rpm HDU	SCSI	4.2 GB	3.5"x1"	HDR 4G54-80
Seagate ST32171WC (SCA conn.)	Ultra-Wide 7200 rpm HDU	SCSI	2.1 GB	3.5" x 1"	HDR 2G72-UW
Seagate ST34371WC (SCA conn.)	Ultra-Wide 7200 rpm HDU	SCSI	4.2 GB	3.5"x 1"	HDR 4G72-UW
Seagate ST19171WC (SCA conn.)	Ultra-Wide 7200 rpm HDU	SCSI	9.1 GB	3.5"x1.6"	HDR 9G72-UW

Notes: *- The HDUs compatible for the system and for the PEM are hot-swappable models fitted on an appropriate slide-in support and equipped with an 80-pin SCA (Single Connector Attachment) interface for direct connection to the system and PEM backplane*
- In RAID configurations, use HDUs with the same speed (all 5400 RPM or all 7200 RPM).
- Ultra Wide HDUs work in the Fast Wide mode if connected to a Fast Wide SCSI controller
- The 9.1 GB ST19171WC HDU can only be fitted in the rack BUs if these modules are located in an area with a temperature of ≤ 25 degrees Centigrade.

ELECTRONIC BOARDS

BOARD NAME	DESCRIPTION	BUS	PDG NAME
BA2263/2323/ 2310	Motherboard with 15 expansion slots, 8 sockets for system DIMMs for a capacity ranging from 32 to 1024 MB, SCSI Wide controller, SVGA controller, 1 MB video memory, 512 KB BIOS Flash EPROM, floppy disk controller, 2 serial ports, parallel port, keyboard and mouse management	-	Under BU
GO2065-166	SNX 460/RS/RM 166 CPU board with a 166/66 MHz Pentium PRO processor installed in ZIF Socket 7, a second ZIF socket for the installation of a second optional 166/66 MHz Pentium PRO processor and 512 KB of second level cache embedded in each processor. One or two CPUs can be installed on each board, for a total of 4 processor per system.	Sys Bus	Under BU or APU SNX66/460
	Additional 166 MHz Pentium PRO processor with a passive heatsink and a VRM.	-	APU 166 PENT6-P
GO2065-200	SNX 460/RS/RM 200 CPU board with a 200/66 MHz Pentium PRO processor installed in ZIF Socket 7, a second ZIF socket for the installation of a second optional 200/66 MHz Pentium PRO processor and 512 KB of second level cache embedded in each processor. One or two CPUs can be installed on each board, for a total of 4 processor per system.	Sys Bus	Under BU or APB 200/P6-P512
	Additional 200 MHz Pentium PRO processor with a passive heatsink and a VRM.	-	APU 200 P6-P512
ME2047	Memory expansion board with eight DIMM sockets for a system memory capacity ranging from 32 MB to 1024 MB. This kit also contains the Configuration Utility diskette rel. 1.04.	Sys Bus	MEM 7000
GO2109 (Lance)	Single-channel single-ended SCSI Wide controller based on the Adaptec AIC 7870 (Lance) chip	PCI	SCC PCI 114W
GO2098 (PM3334W) (RAID DPT)	Single-/tri-channel single-ended SCSI Wide controller, for all systems, allowing RAID-0, 1, 5 arrays for the hot swapping of hard disks. The second and third channels are optional and are provided by an additional board installed in the specific slot on the controller. This controller also has four ECC cache memory sockets; one socket containing 4 MB is always present.	PCI	Under BU or DCR PCI1/3W
IF2048 (SX4030/1W)	Piggy back board for the second SCSI Wide channel (external only), on the GO2098, internal SCSI Wide cable for the connection between the board and SCSI connector flush with the system case.	-	EXP 2NDSCSIW
IF2049 (SX4030/2W)	Piggy back board for the second and third SCSI Wide channel (external only), on the GO2098, internal SCSI Wide cable for the connection between the board and SCSI connector flush with the system case.	-	EXP 2&3SCSIW
GO2173 (PM3334UW) (RAID DPT)	Single-/tri-channel single-ended Ultra Wide SCSI controller allowing RAID-0, 1, 5 arrays for the hot swapping of hard disks. The second and third channels are optional and are provided by an additional board installed in the specific slot on the controller. This controller also has four ECC cache memory sockets; one socket containing 4 MB is always present. Note: Used until GO2098 is no longer in stock.	PCI	DCR PCI1/3UW
IF2065 (SX4030/1UW)	Piggy back board for the second SCSI Ultra-Wide channel (external only), on the GO2173, internal SCSI Wide cable for the connection between the board and SCSI connector flush with the system case.	-	EXP 2NDSCSIUW

BOARD NAME	DESCRIPTION	BUS	PDG NAME
IF2066 (SX4030/2UW)	Piggy back board for the second and third Ultra-Wide SCSI channel (external only), on the GO2173, two internal SCSI Wide cables for the connection between the board and SCSI connectors flush with the case.		EXP 2&3SCSIUW
MEM 2027 (SM4000/4)	One 4 MB ECC SIMM for cache memory expansion on the RAID DPT controllers. Maximum expansion is obtained by adding three kits, for a total of 16 MB. Only 4 MB and 16 MB configurations are supported.	-	RACME 04
IF2046/2067	SCSI Wide backplane connecting the HDU to the SCSI controller and to the power supply.	-	Under BU, PEM Wide
IF2031	Swap Board for the console LED interface.	-	Under BU and PEM
IF2022	Jumper Board joining the the backplane's two SCSI buses. Used in non-duplexing configurations.	-	Under BU and PEM
IF2024	Terminator Board used to terminate the two basic module's backplane SCSI buses. For duplexing configurations only. It also contains the internal SCSI Wide cable for backplane - SCSI controller connections.	-	DUPKIT240W DUP KIT240RM/W
IF2015	Fan power distribution board.	-	Under BU
IF2035	Power supply parallelism board for RS systems. In addition to the board, the redundancy kit also includes the second PS45 power supply, three fans with related support, motherboard-IF2034 connection cable, IF2034-SCSI backplane connection cable, current share cable for the connection of two power supplies. The board is also provided in the PEM RS redundancy kit.	-	RED KIT200
IF2034	Power supply parallelism board for RM systems. In addition to the board, the redundancy kit also includes the second PS45 power supply, three fans with related support, motherboard-IF2034 connection cable, IF2034-SCSI backplane connection cable, current share cable for the connection of two power supplies. The board is also provided in the PEM RM redundancy kit.	-	RED KIT240RM
GO2057 (Stallion)	32-channel RS232D multiport board. The kit also contains the cable for connection to the DBOX.	EISA	C-MUX8-32E
BOX 800	8-way RS232D distribution box for the Stallion (max 4)	-	DBOX 800
BOX 1600	16-way RS232D distribution box for (Max 2)	-	DBOX 1600
(supplier Olicom)	Token Ring 16/4 LAN controller	PCI	OC 3137
(supplier Z'NYX)	Ethernet COMBO (10BaseT + COAX) LAN controller	PCI	ZX312
(supplier 3Com)	Etherlink III, 10Base_T LAN controller	EISA	3C592 TPO
(supplier 3Com)	Etherlink III, 10Base_T + COAX LAN controller	EISA	3C592 COMBO
(supplier 3Com)	Etherlink III, 10Base_T LAN controller	PCI	3C900 TPO
(supplier 3Com)	Etherlink III, 10Base_T + AUI + COAX LAN controller	PCI	3C900 COMBO
(supplier 3Com)	Etherlink III, 16-bit, 10Base_T LAN controller. Used only in dual host configurations with ADHA, and only if there is no other Ethernet 10Base_T LAN controller board installed in the system	ISA	3C509 TPO
(supplier 3Com)	Fast Ethernet 10/100 LAN controller	PCI	3C905 TX
(supplier 3Com)	FDDILink-F 32-bit LAN controller	EISA	3C771A
(supplier 3Com)	FDDILink-UTP 32-bit LAN controller	EISA	3C775A

Note: *Different LAN and WAN controller boards can be installed in the system; the above table lists the more recent boards, listed in the PdG.*

The following table lists the certified network boards, released with the product, with the different operating systems. All the boards listed in the previous table are, however, compatible.

BOARD	SCO 5.0	SCO 3.2.4.2	UNIXWARE 2.1	NT 3.51	OS/2 2.11 OS/2 WARP	NETWARE 4.1
3C590		OK(1)			OK	OK
3C595	OK		OK			OK
3C579			OK			
3C592	OK	OK	OK			
OC3136				OK(2)	OK(2)	
OC3137				OK		
OC3135						OK
OC2123						OK
NE2000						OK
NE3200						OK
ZX312				OK		OK
NCU9180				OK		
INTEL 10/100				OK		

(1) = OK with the driver unloaded from BBS
(2) = The board must be used on the primary bus

POWER SUPPLIES AND SPS

POWER SUPPLY	OUTPUT VOLT.	TOLERANCE	MAX. CURR.	TOT. POW.	INPUT VOLT.	FREQ.	CABINET
PS45	+5 V +12 V -12 V -5 V +5 Aux +3.43 V Fan Out.	+5% -4% +5% -4% +10% -10% +5% -5% +5% -5% +5% -4% -6.4 V / -13.5 V	52 A 11 A 0.5 A 0.2 A 0.6 A 36.4 A 1.6 /3.6	450 W	100-120 Vac 200-240 Vac	50/60 Hz	Base and PEM

Note: *The Fan Output voltage is controlled by a sensor that checks the temperature of the air inside the power supply.*

UPS	TOT POW.	VER.	INPUT VOLTAGE	OUTPUT VOLTAGE	CAB.
APC - SMART UPS 1000 VA (*)	670 W	100/120 Vac	100/120 Vac 50/60 Hz	100/115 Vac 50/60 Hz	External
APC - SMART UPS 1400 VA (*)	950 W	220/240 Vac			
APC - SMART UPS 2200 VA (*)	1600 W		220/240 Vac 50/60 Hz	225/240 Vac 50/60 Hz	
APC - SMART UPS 3000 VA (*)	2250 W				

(*) = Models also existing in a 19" RACK version for connection to the SNX 460/RM.

Note: *By connecting the UPS and system by means of the RS232 serial interface and with the support of the PowerChute Plus software, specific for each operating system and available on diskette, a complete setting of the UPS hardware can be made. This program displays the status of the UPS on the system monitor, but its main feature is to perform a programmed system shutdown in the event of extended line voltage failures. It is also runs a number of personalized operations and functions*

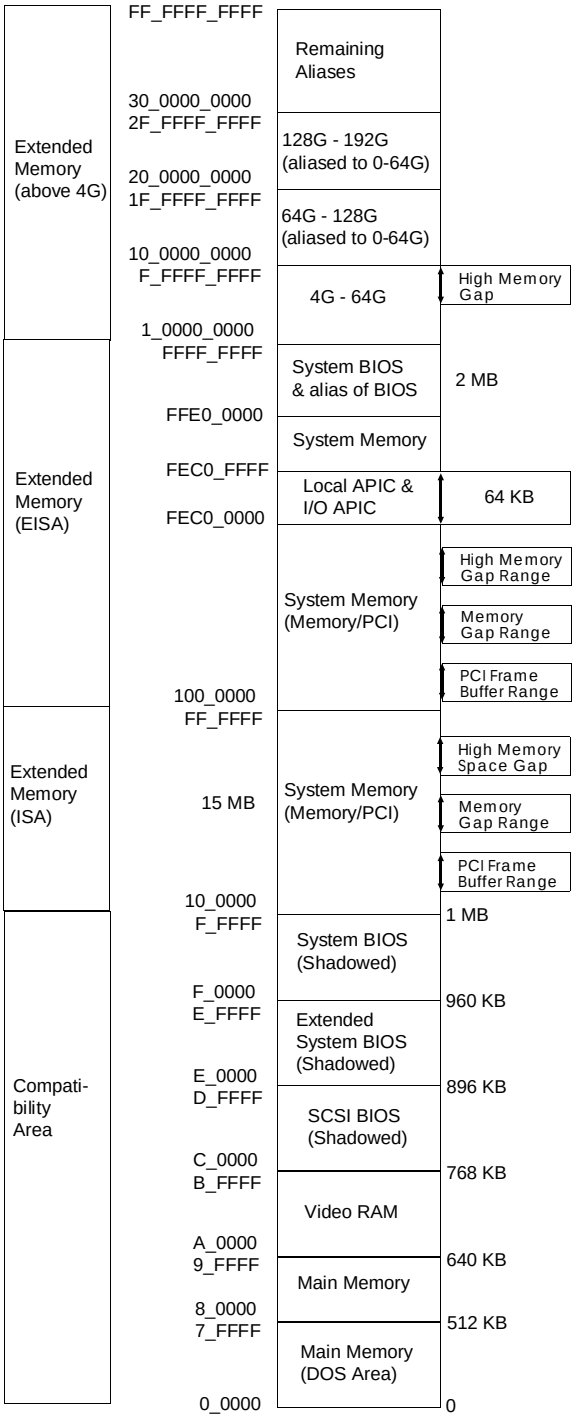
Note: *The UPS model is selected according to the power required by the system, and must be backed up by any external module connected to it such as, for example, a PEM.*

Note: *The UPS can be connected to the network by plugging a LAN board into the specific slot in the UPS itself.*
The batteries on these UPSes can also be replaced without removing power from the load.

SERIAL AND PARALLEL CONNECTION CABLES

PDG	VAR.	DESCRIPTION	LENGTH (m)	CONNECTORS
CBL 2934	-	Cross-wired serial cable for DBOX to printer connections	3	RJ45 - Cannon 8 M - 25 M
CBL 2935	-	Straight serial cable for DBOX to printer connections	3	RJ45 - Cannon 8 M - 25 M
CBL 2938	-	Cross-wired serial cable for DBOX to WS or printer connections	3	RJ45 - Cannon 8 M - 25 F
CBL 5360	-	Cross-wired serial cable for serial port to printer connections	3	Cannon D-shell 25 M - 9 F
CBL 5361	-	Straight serial cable for serial port to modem connections	3	Cannon D-Shell 25 M - 9 F
CBL 5362	-	Cross-wired serial for serial port to WS or printer connections	3	Cannon D-shell 25 M - 9 F
CBL 2491	CAV145	Parallel cable for parallel port to peripheral connections	1.5	Cannon - Centronics 25 M - 36 M
	CAV146		3	
CBL 2858	CAV 143	Straight serial extension cable for modem or printer connections. Used as an extension for cables CBL 5360, CBL 2934, CBL 5361 and CBL 2935.	3	Cannon - Cannon 25 F - 25 M
	CAV 144		6	

INTERRUPT LEVELS



NAME	STATUS	FUNCTION	NOTES
NMI		Fatal errors: ECC error in RAM or on CBUS-II, bus time out, CPU board parity error	Parity error, channel control, bus master timeout, debugging port
IRQ0	Reserved	System timer	Internal timer used by the BIOS
IRQ1	Reserved	Keyboard	
IRQ2	Free		Used as alternative to IRQ9

IRQ3		COM2	Also used for the console
IRQ4		COM1	Also used for the console
IRQ5	Free		Free or SCSI controller
IRQ6		Floppy disk controller	
IRQ7		LPT1	
IRQ8	Reserved	Real Time Clock	
IRQ9	Free		Used as alternative to IRQ2. IRQ9 is preferably used on ISA LAN boards
IRQ10		Dagger SCSI Controller	Free or Dagger SCSI controller
IRQ11	Free		Used for EISA LAN or COM1
IRQ12		PS/2-compatible mouse	
IRQ13	Reserved	Numeric coprocesors	
IRQ14	Free		
IRQ15		RAID SCSI controller	Free or RAID SCSI controller

Note: *IRQs 2 and 9 belong to the same line and must therefore be used in alternative to each other.*

DMA CHANNELS

DMA	FUNCTION	DMA	FUNCTION
0	Free	4	Reserved
1	Free or parallel port if the extended mode (ZIPPY) is enabled	5	Free
2	FDU transfers	6	Free
3	Free	7	Free

SYSTEM MEMORY MAP

DEVICE ADDRESSES ON THE PCI BUS AND PENTIUM PRO SYSTEM BUS

Device No	Bus No	Location	Component
0H	0	Primary PCI bus	Non-existent
1H	0	Primary PCI bus	PCI connector J20
2H	0	Primary PCI bus	PCI connector J19
3H	0	Primary PCI bus	PCI connector J12
4H	0	Primary PCI bus	PCI connector J13
5H	0	Primary PCI bus	PCI-EISA Bridge (PCEB)
06H-0FH	0	Primary PCI bus	Non-existent
10H-13H	0	Pentium PRO System Bus	Non-existent
14H	0	Pentium PRO System Bus	OMC
15H-18H	0	Pentium PRO System Bus	Non-existent
19H	0	Pentium PRO System Bus	OPB compatibility
1AH	0	Pentium PRO System Bus	Secondary OPB
1BH-1FH	0	Pentium PRO System Bus	Non-existent
0H	1	Secondary PCI bus	SCSI controller AIC7870
1H	1	Secondary PCI bus	PCI connector J14
2H	1	Secondary PCI bus	PCI connector J16
3H	1	Secondary PCI bus	PCI connector J17
4H	1	Secondary PCI bus	PCI connector J18
5H-0FH	1	Secondary PCI bus	Non-existent
10H-1FH	1	Pentium PRO System Bus	Non-existent

POWER ON DIAGNOSTIC MESSAGES

ERROR MESSAGES	DESCRIPTION
SYSTEM BOOTSTRAP ERROR MESSAGES	
Non-System Disk or Disk Error Replace Disk and Strike Any Key	A damaged diskette, or one without the bootable file, has been inserted in drive A at system power on. The diskette must be replaced by a suitable diskette. It may also be that the drive and the diskette are not compatible, that the drive is not set correctly in the ROM Setup utility, check.
No ROM BASIC Available - RESET	There is an error in the system BIOS if the error presists after a reset. Replace the CPU board and rewrite the BIOS flash EPROM.
CPU CACHE MEMORY TEST ERROR MESSAGES	
Primary Cache Addr Line Error	Primary cache error. Run the diagnostics, replace the processor or the CPU board.
Primary Cache INVD Error	Primary cache error. Run the diagnostics, replace the processor or the CPU board.
Primary Cache Flush Error	Primary cache error. Run the diagnostics, replace the processor or the CPU board.
Primary Cache Read/Write Error	Primary cache error. Run the diagnostics, replace the processor or the CPU board.
Secondary Cache Addr Line Error	Secondary cache error. Run the diagnostics, replace the processor or the CPU board.
Secondary Cache Read/Write Error	Secondary cache error. Make sure that the jumper setting on the CPU board complies with cache memory capacity. Replace the cache module.
Secondary Cache Copy-Back Error	Secondary cache error. Run the diagnostics, replace the processor or the CPU board.
Secondary Cache Gate A20 Line Error	Secondary cache error. Run the diagnostics, replace the processor or the CPU board.
Secondary Cache Shadow RAM Error	Secondary cache error. Make sure that the jumper setting on the CPU board complies with cache memory capacity. Replace the cache module.
CPU ERROR MESSAGES	
CPU x Selftest xxx MHz Error Ckpt: xxH Error	Replace the processor and the CPU board.
DMA REGISTER ERROR MESSAGES	
DMA Address Register Error	DMA controller error. Run the diagnostics, replace the motherboard.
DMA Count Register Error	DMA controller error. Run the diagnostics, replace the motherboard.
DMA Mask Register Error	DMA controller error. Run the diagnostics, replace the motherboard.
DMA Page Register Error	DMA controller error. Run the diagnostics, replace the motherboard.
DMA Stop Register Error	DMA controller error. Run the diagnostics, replace the motherboard.
EISA/PCI ERROR MESSAGES	
ID Configuration Error in slot(s): xx	The slot x EISA ID stored in EEPROM does not match the true EISA ID. Either a new EISA board is installed in the slot or an existing board has been removed. Check by running the ECU.
ID Timeout Error in slot(s): xx	Timeout during the reading of the EISA ID of the board installed in slot x. Make sure the board is inserted in the slot, replace the board or the motherboard.
RAM/ROM Attribute Conflict Error in slot(s): xx	The memory attribute assigned to the board installed in slot x is in conflict with the attribute available for this memory range. Run the ECU.

ERROR MESSAGES	DESCRIPTION
C000: Seg RAM/ROM Attrib Conflict Error in slot(s): xx	The C000 range is set as RAM in slot x but the user configured the C000 range for shadowing purposes (as a ROM). Run the ECU.
C800: Seg RAM/ROM Attrib Conflict Error in slot(s): xx	The C000 range is set as RAM in slot x but the user configured the C000 range for shadowing purposes (as a ROM). Run the ECU.
D000: Seg RAM/ROM Attrib Conflict Error in slot(s): xx	The C000 range is set as RAM in slot x but the user configured the C000 range for shadowing purposes (as a ROM). Run the ECU.
D800: Seg RAM/ROM Attrib Conflict Error in slot(s): xx	The C000 range is set as RAM in slot x but the user configured the C000 range for shadowing purposes (as a ROM). Run the ECU.
Incomplete Configuration Error in slot(s): xx	The configuration in EEPROM of the board installed in slot x is incomplete. Run the ECU.
Invalid Configuration Error in slot(s): xx	Configuration error in EEPROM relating to the board installed in slot x. Run the ECU.
Invalid DMA Configuration Error in slot(s): xx	DMA configuration error in EEPROM relating to the board installed in slot x. Run the ECU.
Invalid IRQ Configuration Error in slot(s): xx	IRQ configuration error in EEPROM relating to the board installed inslot x. Run the ECU.
Invalid Memory Configuration Error in slot(s): xx	Memory configuration error of the board installed in slot xx. Configure the board.
Invalid Port Configuration Error in slot(s): xx	I/O port configuration error in EEPROM relating to the board installed in slot x. Run the ECU.
Invalid Slot Init Error in slot(s): xx	The POD have detected a configuration error in EEPROM relating to the board installed in slot x. Run the ECU.
Video RAM Attribute Error in slot(s): xx	The video RAM of the board installed in slot x is incorrectly set as a read-only or as a cacheable memory (video RAM is read/write only, and not cacheable). Run the ECU.
PCI Configuration in slot xx	Configuration error. Insufficient system memory or buffer allocation error. Run the ECU to manually solve this configuration conflict.
FLOPPY DISK ERROR MESSAGES	
Floppy Disk CMOS Count Config Error	The floppy disk drive number configured in the EEPROM is not the same as the one detected by the POD. Run the ROM Setup utility, check the FDU signals and power cables.
Floppy Disk Type Configuration Error	The floppy disk drive number configured in the EEPROM is not the same as the one detected by the POD. Run the ROM Setup utility.
Floppy Disk Controller Config Error	The floppy controller is not configured correctly. Run the ROM Setup utility.
Floppy Disk ESC Enable/Disable Error	The floppy disk controller has not been enabled by the ESC; replace the motherboard.
Floppy Disk Port 3F3h Media Sensing Error	Port 3F3h, which contains information on the type of floppy disk and support installed, has failed a compatibility test. Run the ROM Setup Utility, replace the motherboard.
Floppy Disk Port 3F3h Read/Write Error	Read/write operations on floppy disk port 3F3h are not performed correctly during the POD. Run the ROM Setup Utility, replace the motherboard.
KEYBOARD/ MOUSE ERROR MESSAGES	
Keyboard Controller Communication Error	Communication error with the keyboard controller. Run the diagnostics, check keyboard connection, replace the cable, keyboard, or motherboard.
Keyboard Controller Selftest Error	The keyboard controller selftest has failed. Run the diagnostics, replace the keyboard.
Keyboard Clock/Data Line Error	The keyboard control signals are interrupted or shorted. Run the diagnostics, check the keyboard connection, replace the cable, the keyboard, then the motherboard.

ERROR MESSAGES	DESCRIPTION
Keyboard Interrupt Error	Interrupt test failure on the keyboard controller. Run the diagnostics, replace the motherboard.
Keyboard Controller Error	Keyboard controller error. Run the diagnostics, replace the motherboard
Keyboard Selftest Error	The keyboard self-test has failed. Run the diagnostics, replace the keyboard or the motherboard.
Keyboard Stuck Key Code: xxh Error	Stuck key condition detected on the keyboard; the scan code of the stuck key is displayed in the hex format. Run the diagnostics, replace the motherboard.
Pointing Device Error	Error during the mouse test. Run the diagnostics, replace the mouse, then the motherboard
Keyboard/Pointing Device Fuse Error	Keyboard/mouse fuse blown. Replace it.
COPROCESSOR ERROR MESSAGES	
Math Coprocessor Stack Error	Internal processor error. Run the diagnostics, replace the processor or the CPU board.
Math Coprocessor Trig Error	Internal processor error. Run the diagnostics, replace the processor or the CPU board.
Math Coprocessor Logarithm Error	Internal processor error. Run the diagnostics, replace the processor or the CPU board.
Math Coprocessor Exception Error	Internal processor error. Run the diagnostics, replace the processor or the CPU board.
Math Coprocessor Interrupt Error	Internal processor error. Run the diagnostics, replace the processor or the CPU board.
Math Coprocessor Config Error	The coprocessor is configured as being present, but it is not found, or the coprocessor is configured as being not present but has been found. Run the ROM Setup Utility, then replace the CPU board.
MEMORY TEST ERROR MESSAGES	
Base Memory Adapter Parity Error in Slot: xx	Memory access error. Check the installation of the DIMMs. Replace the DIMMs, memory board or motherboard.
Base Memory Address Line Error at Addr: xxxxxxxxh Wrote: xxxxxxxxh Read: xxxxxxxxh	Memory access error. Check the installation of the DIMMs. Replace the DIMMs, memory board or motherboard.
Base Memory Dword Access Error at Addr: xxxxxxxxh, Wrote: xxxxxxxxh Read: xxxxxxxxh	Memory access error. Check the installation of the DIMMs. Replace the DIMMs, motherboard or memory expansion board.
Base Memory Read/Write Error at Addr: xxxxxxxxh, Wrote: xxxxxxxxh Read: xxxxxxxxh	Memory access error. Check the installation of the DIMMs. Replace the DIMMs, motherboard or memory expansion board.
Base Memory System Parity Error at Addr: xxxxxxxxh, Wrote: xxxxxxxxh Read: xxxxxxxxh	Memory access error. Check the installation of the DIMMs. Replace the DIMMs, motherboard or memory expansion board.
Base Memory Configuration Error	The base memory capacity configured is different than the capacity actually installed. Run the ROM Setup Utility and this error condition is automatically corrected.
Extended Memory Configuration Error	The extended memory capacity configured is different than the capacity actually installed. Run the ROM Setup Utility and this error condition is automatically corrected.
Memory Miscompare Error	The base or extended memory capacity configured is different than the capacity actually installed. Run the ROM Setup Utility and this error condition is automatically corrected.
Extended Memory Adapter Parity error in Slot: xx	Parity error on the EISA/ISA board installed in slot x. Run the ECU, replace the board installed in slot xx, replace the motherboard.
Extended Memory Dword Access Error at Addr: xxxxxxxxh Wrote: xxxxxxxxh Read: xxxxxxxxh	The DRAM word access control signals are interrupted or shorted. Run the diagnostics, replace the motherboard or the memory expansion board.

ERROR MESSAGES	DESCRIPTION
Extended Memory Address Line Error at Addr: xxxxxxxxh Wrote: xxxxxxxxh Read: xxxxxxxxh	The DRAM address signals are interrupted or shorted. Run the diagnostics, replace the CPU board.
Extended Memory Read/Write Error at Addr: xxxxxxxxh Wrote: xxxxxxxxh Read: xxxxxxxxh	DRAM read/write error or EEPROM configuration error. Check the configuration, run the diagnostics, replace the DIMMs, replace the motherboard.
Extended Memory System Parity Error at Addr: xxxxxxxxh Wrote: xxxxxxxxh Read: xxxxxxxxh	System memory parity error. Check the installation of the DIMMs on the CPU board, run the diagnostics, replace the DIMMs, the motherboard or the memory expansion board.
Total Memory Configuration error	The total memory capacity configured is different that the capacity actually installed. Run the ROM Setup Utility and this error condition is automatically corrected.
Unable to Enter Protected Mode	Run the diagnostics, replace the motherboard.
Unable To Clear Parity/IOCC Error	Parity error during I/O access (depends on the previous error). Run the diagnostics, replace the motherboard.
REMOTE TERMINAL, SERIAL PORT PARALLEL PORT ERROR MESSAGES	
Remote Terminal Configuration Error	Invalid terminal type or COM port selection, or the COM port selected is disabled or not available, or there is no terminal connected to the COM port. Run the Configuration Utility.
Remote Terminal Hardware Error	The COM port selected does not work. Replace the motherboard.
Remote Terminal Installation Error	The remote terminal feature has been requested but there is no I/O device (monitor/keyboard, remote terminal via COM2 or remote terminal via COM1) available. Run the Configuration Utility.
Serial Port x Address Conflict Error	Address conflicts between the motherboard serial port and the COMx serial port on the expansion ISA board. Run the ECU.
Serial Port x IRQ Config Error	COMx serial port IRQ configuration error. Run the Setup Utility.
Serial Port x Reg Read/Write Test Error	COMx serial port hardware error. Run the diagnostics, replace the motherboard.
Serial Port x MODEM Loopback Test Error	COMx serial port hardware error. Run the diagnostics, replace the motherboard.
Serial Port x FIFO Buffer Test Error	COMx serial port hardware error. Run the diagnostics, replace the motherboard.
Serial Port x Interrupt Test Error	COMx serial port hardware error. Run the diagnostics, replace the motherboard.
Parallel Port Address Conflict Error	I/O address conflicts between the motherboard parallel port and another board installed on the ISA bus. Run the ECU.
Parallel Port IRQ Config Error	Reconfigure the parallel port.
Parallel Port Compatible Mode Error	Parallel port hardware error. Run the diagnostics, replace the motherboard.
Parallel Port Extended Mode Error	Parallel port hardware error. Run the diagnostics, replace the motherboard.
PASSWORD ERROR MESSAGES	
Invalid Password	Enter the correct password; if it is not known, move jumper JP1 on the motherboard.
SYSTEM HALTED!	Message displayed after three incorrect password entries; if the password is not known, move jumper JP1 on the motherboard.

ERROR MESSAGES	DESCRIPTION
SYSTEM ERROR MESSAGES	
CPU Exception Error Has Occurred CPU Exception: xxh POD Checkpoint: xxxxh CPU Error Code: xxh Phisical Address: xxxx.xxxxh CS:EIP=...	Reinitialize the system; replace the CPU board if the problem persists.
Received 65536 spurious interrupts!! SYSTEM HALTED!!	Reinitialize the system; replace the CPU board if the problem persists.
Unable to clear the error condition	Reinitialize the system; replace the CPU board if the problem persists.
FATAL ERROR, System Halted! BIOS Microcode Update FAIL: CPU x	Reinitialize the system; replace the CPU board if the problem persists.
CPU or TERM Card #x Presence Error FATAL ERROR. System Halted	Check for the presence in the system of a a second CPU board or of the terminator board.
Configuration Bypass Jumper Installed	Jumper JP1 is present.
CMOS Battery Lost Power	Discharged RTC CMOS RAM battery condition detected. Replace the motherboard and run the ECU.
CMOS Clock/Calendar Error	The Real Time Clock cannot keep the correct date and time. Run the ROM Setup Utility. If the error persists, replace the RTC chip, then the motherboard.
CMOS Checksum Error	An error has been found during a check on the consistency of the data stored in CMOS RAM. Run the ECU, run the diagnostics, replace the motherboard.
Configuration Memory Checksum Error	Reconfigure the system.
Fail-Safe Timer Error	The EISA timer test has failed. Run the diagnostics, replace the motherboard.
CMOS Video Shadow RAM Config Error	EEPROM configuration error for video shadowing. Run the Setup Utility.
ACFG (Auto Config) Error	Error during the internal self-configuration process. Insufficient system memory or buffer allocation error. Run the ECU to maually solve the configuration conflict.
PCI Configuration Error	
Hardware Error(s) Detected... Run Diagnostics Program	A hardware error has been detected in the system. Run the diagnostics.
Configuration Error(s) Detected... Run System Configuration Program	A configuration error has been detected. Run the ECU.
PnP Configuration Error	Error during the internal self-configuration process. Insufficient system memory or buffer allocation error. Run the ECU to maually solve the configuration conflict.
xxxxh Segment Shadow RAM Disabled/Error	An error has been detected during option ROM shadowing in segment xxxxh. Incorrect optional board configuration, run the ECU.
ONBOARD LANCE SCSI CONTROLLER, OPTIONAL LANCE GO2109 AND GO2172 SCSI CONTROLLERS ERROR MESSAGES	
BIOS Not Installed	There are no BIOS-supported SCSI devices connected to the controller.
Host Adapter Configuration Error	SCSI controller configuration error. Run the ECU or the ROM Setup Utility.
Can’t Locate Host Adapter	The Adaptec BIOS is unable to communicate with the SCSI board. Replace the SCSI controller.
Device Connected, but Not Ready	The SCSI device has failed the Test Unit Ready command during initialization. Check the connections and run the test on the device.

ERROR MESSAGES	DESCRIPTION
Start Unit Request Failed	The SCSI device has failed the Start Unit command during initialization. Check the connections and run the test on the device.
Time-out Failure During SCSI Inquiry Command!	The Lance SCSI controller did not issue the interrupt when the Inquiry SCSI command is sent during initialization. Replace the SCSI controller.
Time-out Failure During SCSI Test Unit Ready Command	The Lance SCSI controller did not issue the interrupt when the Test Unit SCSI command is sent during initialization. Replace the SCSI controller.
Time-out Failure During SCSI Start Unit Command	The Lance SCSI controller did not issue the interrupt when the Start Unit SCSI command is sent during initialization. Replace the SCSI controller.
Invalid Hard Disk CMOS Config Error	Reconfigure the system.
INTERPROCESSOR INTERRUPT ERROR MESSAGES	
APIC interrupt selftest Error	
APIC IPI transmit Error	
APIC Inter-Processor Interrupt Error	
VIDEO ERROR MESSAGES	
Video Configuration Error	Configuration error. Run the ROM Setup to change the video configuration.
Video Option ROM Checksum Error	Run the BIOS Flash again or replace the CPU or motherboard.
WARNING MESSAGES	
Warning: Some non-default advanced system performance settings have been chosen. These could cause the system to hang.	Run the ROM Setup Utility. Use the Default option also in the Advanced Features.
MICROPROCESSOR RUN-TIME ERROR MESSAGES (AFTER THE POD)	
ERROR - CPU Machine Check Condition Occurred	An internal CPU failure has occurred. The specific cause and addrss are indicated in one of the following messages. If the failure is fatal, the message will be preceded by the word LOCKED.
LOCKED	
Interrupt Acknowledge Cycle at Address: xxxxxxxxh	Replace the processor(s) or the CPU board.
Special Cycle at Address: xxxxxxxxh	Replace the processor(s) or the CPU board.
I/O Read Cycle at Address: xxxxxxxxh	Replace the processor(s) or the CPU board.
I/O Write Cycle at Address: xxxxxxxxh	Replace the processor(s) or the CPU board.
Code Read Cycle at Address: xxxxxxxxh	Replace the processor(s) or the CPU board.
Unknown Cycle at Address: xxxxxxxxh	Replace the processor(s) or the CPU board.
Memory Read Cycle at Address: xxxxxxxxh	Replace the processor(s) or the CPU board.
Memory Write Cycle at Address: xxxxxxxxh	Replace the processor(s) or the CPU board.
FATAL ERROR, System is Halted	Last message displayed after the indication of the address and of the type of CPU cycle. Indicates an unrecoverable error.
NMI RUN-TIME ERROR MESSAGES (AFTER THE POD)	
NMI Interrupt: Unknown Source	An error has been detected but not its source; remove the boards installed on the EISA and PCI buses one at a time, then replace the motherboard.
NMI Interrupt: I/O Channel Check in slot: xx	An error has been detected during the check made on the I/O channel of the board installed in slot xx. Replace the board, then the motherboard.

ERROR MESSAGES	DESCRIPTION
NMI Interrupt: EISA System Software Generated NMI	The EISA subsystem software has generated an NMI. Replace the processor(s), the CPU board, the motherboard.
NMI Interrupt: EISA DMA Bus Time-out in slot: xx	EISA bus timeout error for the board installed in slot xx. Replace the board, then the motherboard.
NMI Interrupt: EISA Failsafe Timer Time-out	EISA Filesafe Timer timeout error. Replace the motherboard.
Unable to Clear the Error Condition	The system is unable to clear the error condition.
System is Halted - Please Reset	Last message displayed after one of the above messages.

Note: *The error messages relating to the RAID DPT SCSI controller are listed in Appendix C under the section dealing with this specific controller.*

SYSTEM CONFIGURATION UTILITIES

The system configuration utilities consist of two to four programs depending on whether the system is equipped with the RAID SCSI controller or not. The first program, called Built-In ROM Setup, resides in the system BIOS EPROM and can therefore be activated directly from the keyboard. The second and third programs called EISA Configuration Utility (ECU 3.x) and Storage Manager, respectively, are stored on the Orchestra CD-ROM provided in the system Starter Kit. The fourth program, called DPT Configuration Utility, resides in the firmware of the RAID DPT controller and can therefore be activated directly from the keyboard.
The Built-IN ROM Setup program is described in Appendix E, the Storage Manager in Appendix F, while general information on the Starter Kit as far as software configuration is concerned is provided below.

ORCHESTRA SYSTEMA CD-ROM

The Orchestra CD-ROM kit consists of the following disks:

- **Orchestra Systema Boot.** 3.5" 1.44 MB diskette which is used to boot to system and access the contents of the Orchestra Systema CD-ROM. This disk also contains the A:\CFG\SYSTEM.SCI file containing the current system configuration.
- **Orchestra Systema Diagnostics.** 3.5" 1.44 MB diskette (five languages) containinga set of low level tests for the hardware modules installed in the system. To run a more extended test on the system, the field engineer can use the System Test diskette which differs from the diagnostic diskette provided in the kit mainly for the addition of certain destructive tests that could be dangerous to be used at user level.
- **Orchestra Systema CD-ROM.** CD-ROM containing all the software that can be installed on the systems (for example drivers) including the available configuration utilities. In an appropriate directory, this CD-ROM also contains a library of EISA and ISA configuration files which includes the *.CFG files for the different expansion boards that can be added to the system and that are therefore not present in the directory of the configurator.
  The user interface, called Orchestra Systema, is only available in English. This CD-ROM allows the following major functions:
  - Provide information on the configuration of EISA and ISA boards by means of the **EISA Configuration Utility** (ECU).
  - Automatically configure the EISA boards.
  - Provide information on the jumper settings of the more renown optional ISA boards.
  - Provide information on the resources assigned to PCI and P&P ISA boards.
  - By running the **Storage Manager Utility** (available for systems equipped with the RAID SCSI controller), check the hardware configuration of the RAID DPT SCSI controllers and of the devices connected to them, configure Disk Arrays and run SCSI subsystem diagnostics.
  - Report of any configuration conflict and attempt to solve it automatically.
  - Provide and support the configuration files (CFG) contained on the CD-ROM.
  - Create and update the System Configuration Information file (SYSTEM.SCI) on the boot diskette as backup for the system non-volatile memory.
  - Provide the online documentation relating to the boards installed in the basic module.

– **Install the Resilience Support software package** (only for systems in a resilience configuration) which in turn consists of the OLIHIT and OLISAR software packages.

  OLIHIT, together with the swap board, allows the management of dangerous situations caused by high temperatures or by the redundant components present in the system and PEM. The following are checked in particular:
  - High temperatures, in the basic module and PEM
  - Power supply failures, in redundant systems and PEMs
  - Fan failures, in redundant systems and PEMs

  When any of the above events occurs, the OLIHIT software takes the following actions:
  - Sends messages to the user
  - Records the failure in the error log file
  - Shuts down the operating system in the more dangerous cases, such as high temperatures or fan failures.
  - Automatically turns the system off when the UPS is not present.

  OLISAR allows the management of the SAR (Systema Automatic Restart) feature which is a hardware/firmware/software mechanism capable of automatically restarting the system after a hang caused by hardware/software failures. The main purpose of the OLISAR package is to reduce the time between the moment at which the event occurred and the moment of operator intervention. When enabled and activated, the SAR feature performs the following operations:
  - Starts a hardware counter.
  - Resets the system when the counter reaches a determined value.

  OLISAR can determine the number of resets to be performed before powering off the system and the time span between the system hang and the reset. The SAR feature is initially disabled and can only be enabled via software.

– Install the **Server View** software that provides, within a local area network, an intelligent monitoring and signalling system that allows a visual check to be made on the network servers through a Windows workstation.

CONFIGURATION OF OPTIONAL BOARDS

Any system device requires the availability of resources to use in order to work and communicate with other devics. Basically there is the need to define which interrupts, memory addresses and DMA channels must be assigned to this device. The term device refers to a component integrated on the motherboard, the motherboard installed on the bus and the different peripherals connected to the system. System configuration means assigning these resources without generating conflicts between the different devices.

This product line uses the Plug and Play (PnP) technology that, along with the system BIOS, allows the automatic configuration of PCI and Plug and Play ISA AT boards according to the resources available. Furthermore, thanks to the ECU, this technology allows the automatic configuration of EISA boards and also provides configuration information for earlier ISA AT boards that are configured by means of jumpers or DIP-switches so that conflicts with other system devices are avoided.

CONFIGURATION OF PCI AND ISA AT PLUG AND PLAY BOARDS

These boards are implemented with specific hardware through which they can communicate with the system. By means of this hardware, the boards can inform the system of the resources they need and of possible alternatives.

The system BIOS implements a code which is capable of supporting this technology. Each time the system is activated, during the POD this code controls all the expansion boards and devices installed, detects the resources that are available in NVRAM and automatically assigns these resources in the best possible way. In case of unresolvable conflicts during the division of these resources, the BIOS is capable of relinquishing the control over to the EISA Configuration Utility (ECU). The utility will require operator intervention who at this point will decide how to solve the conflicts.

During the POD configuration phase all the resources that can be automatically modified by the BIOS are considered as available. Therefore by installing a new board it may be possible that the resources assigned to PCI and ISA PnP boards previously insalled in the system are changed.

At the end of installation it is possible to activate the Built-in ROM Setup or EISA Configuration Utility which, along with the Configuration Manager, displays the resources that have been automatically assigned by the BIOS. Some of these resources can also be modified by using the utility, and any changes made are only accepted if they do not generate conflicts with other devices. If they do, the previous BIOS values are restored the next time the system is powered on.

Even when a PCI or ISA P&P board is removed, this board needs to be physically removed from the bus and the system rebooted so that it is automatically cleared from the configuration.

Note: *Even though being PCI boards, the SCSI controllers have certain parameters (such as the termination or ID) that must be set or of which the default values have to be checked by means of the configuration utility.*

CONFIGURATION OF EISA AND ISA BOARDS

The EISA Configuration Utility (ECU) allows the automatic configuration of EISA boards and guides the user in the configuration of non-Plug and Play ISA AT boards.

Each optional EISA or ISA board comes with a diskette containing a file (.CFG extension) with information on the resources needed for the configuration of the board and on the alternative values. The ECU is capable of reading this information and of assigning automatically, in the case of EISA boards, or suggesting, in the case of ISA boards, the resources for the determined board without generating any conflict. If there are jumpers or DIP-Switches on the board (usually EISA boards do not have any), the ECU is capable of indicating any setting according to how the resources have been assigned.

The system configuration utility has a database with the configuration data of the more common EISA and ISA AT boards. Before physically installing a board, its related .CFG file needs to be added to the database if it is not already present.

During the ECU configuration phase, all the resources that can be modified automatically are considered as being available. Therefore by installing a new board it may be possible that the resources assigned to boards previously installed in the system are changed. In the case of ISA boards with jumpers or DIP-Switches, a check must be made to see whether the settings are still valid or not. To avoid this inconvenience, by means of a specific command, block all the configuration parameters of the boards that must be configured manually through jumpers or DIP-Switches, or block all the configuration parameters assigned. The configuration needs to be unblocked during the solving of any conflict between resources.

At the end of the configuration process all data are stored in the motherboard EEPROM so that the system resources are checked each time the system is bootstrapped. The data are also stored in the System Configuration Information file (SYSTEM.SCI) contained in the System Configuration diskette or in the Orchestra Systema Boot diskette. This file is automatically updated at each successive configuration.

Note: *All User Disk functions are self-explanatory and aided by an online Help facility which can be invoked by pressing the F1 key. The Utility can therefore be run correctly by simply following the instructions displayed.*

NOTES ON THE CONFIGURATION OF LINE BOARDS WITH AT INTERFACE

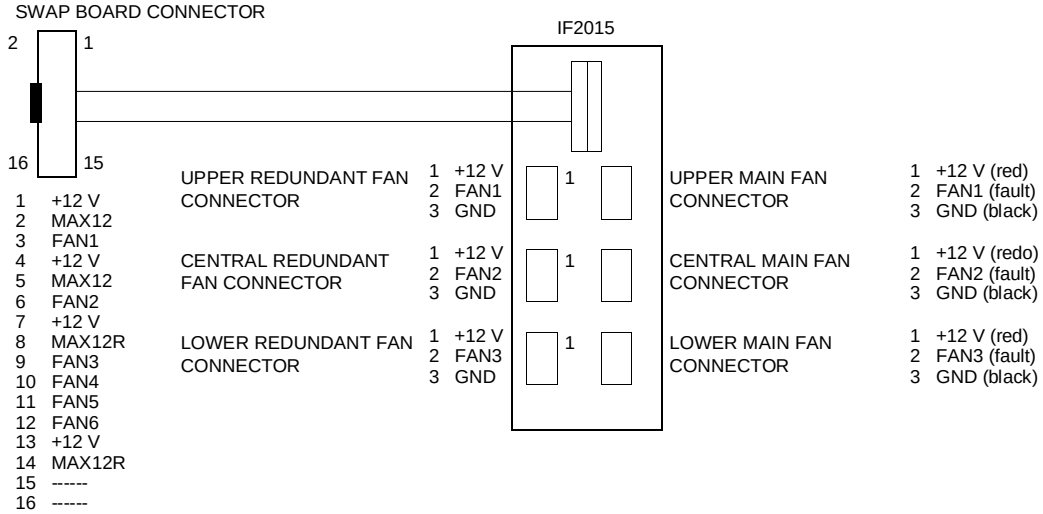
The Multiport and LAN/WAN boards with AT interface installed in this system can only be mapped in megabyte F since the memory map views the first megabyte as being entirely occupied by system memory and therefore there is no way of creating a 128 KB memory gap from 512 to 640 KB and a 96 KB gap from 800 to 896 KB.

The installation of EISA boards does not require, however, the opening of system memory spaces as they can be mapped beyond the maximum memory capacity that can be installed in the system.

ORCHESTRA SYSTEMA CD-ROM EVOLUTION

DATE	REL.	REASON FOR CHANGE
6/96	1.3	New Orchestra Systema CD-ROM code 2692500 G and boot floppy code 2693248 M. The following main programs are on the CD-ROM: - Configuration Utility rel 0.20 based on MCS ECU ver. 3.01. - EVD drivers 1.07 upd2 - SCSI drivers rel 1.21L - Storage Manager rel. 2.2 - Resilience Support rel. 2.3 with SAR support except for SCO 3.2.4.2 - Server View rel 2.02 - Power Chute rel 4.2.1 UPS driver for the following O.S.: SCO UNIX 3.2.4.2, SCO Open Server R5.0, SCO UnixWare 2.1, OS/2 R2.1 V2.11, OS/2 R3.0 Warp. - Power Net rel 1.0 UPS driver for the following O.S.: Windows NT 3.51, NetWare 3.12, NetWare 4.1. - ZNIX V1.0 driver for the ZX312 LAN controller. This version of Orchestra is also used on the SNX 140/S 160/S; the specific software for each system, for example the Configuration Utility, is automatically loaded.
9/96	1.5	New Orchestra CD-ROM code 2692506 N-01 and boot floppy code 2693287 C releases with the following differences: - Configuration Utility rel. 1.02: - OLI0809.cfg: solves system hangs with Storage Manager and 128 MB of memory. - OLI7850.ovl, OLI7870.ovl: some entries like "Enable Translate for HDU > 1 GB" are always set to Enabled; entry "Include in BIOS Scan" is reintroduced. - NetStrada 7000 system name added. - Support for the AIC 7880 Ultra Wide SCSI controller. - All Dagger/Lance/Ultra configuration files include BIOS adapter enabling and boot enabling/disabling from CD. - Possibility of configuring the DPT controller I/O port to FC00/F400/EC00 E400/DC00/D400/CC00/C400 when the board is not on the primary PCI bus, to prevent the DPT SmartROM from hanging. - Resilience Support rel. 2.4 - Solves problems with Olihit - OLISAR availablility for all operating systems, OLIECC excluded - Solves the problems with the Help in all the O.S. - Server View rel 2.1 This Orchestra release must be distributed with systems equipped with a BIOS release equivalent to or higher than 2.02. This version of Orchestra is also used on the SNX 1x0/S and 160/RS/RM; the specific software for each system, for example the Configuration Utility, is loaded automatically.

DATE	REL.	REASON FOR CHANGE
3/97	1.6	New Orchestra CD-ROM code 2692535 Z and boot floppy code 2692138 N releases with the following differences: - Configuration Utility rel 1.03: - The "Primary Operating System" option includes the "Multi-Processor" or "Single-Processor" entries according to the operating system kernel. - Introduction of the support for NT 4.0. - Removed the SMP package for NetWare 4.1 (the multiprocessor version is rel. 4.11). - Support for the Ultra SCSI controller. - Resilience Support rel 2.6 - Description of NetStrada 5000 and 7000 in the package documentation. - Server View rel 2.3 - Recognition and management of NetStrada 5000 and 7000 systems. - Support for the servers with the OS/2 operating system - Improvements to the management station graphical interface. - Addition of the SAR OFF utility. This Orchestra release is introduced together with BIOS rel. 2.03. This version of Orchestra is also used on the SNX 1x0/S, 160/RS/RM, NetStrada 5000/7000; the specific software for each system, for example the Configuration Utility, is loaded automatically. **Note:** The Starter Kit that includes Orchestra 1.6 also contains an additional floppy labelled "SNX 460 RS/RM Supplemental disk for NT 3.51" code 2692268 K, as support to the installation of NT 3.51 in the presence of the Adaptec AIC 7870-7880.

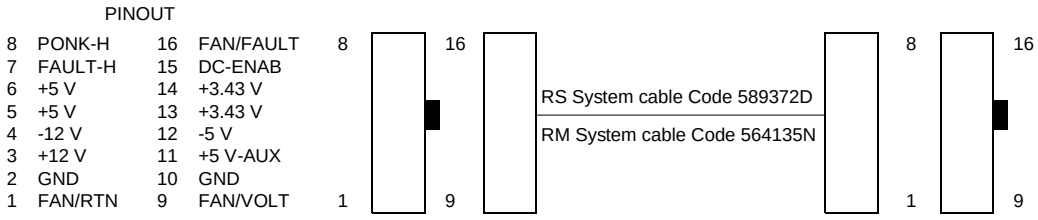


USER DIAGNOSTICS EVOLUTION

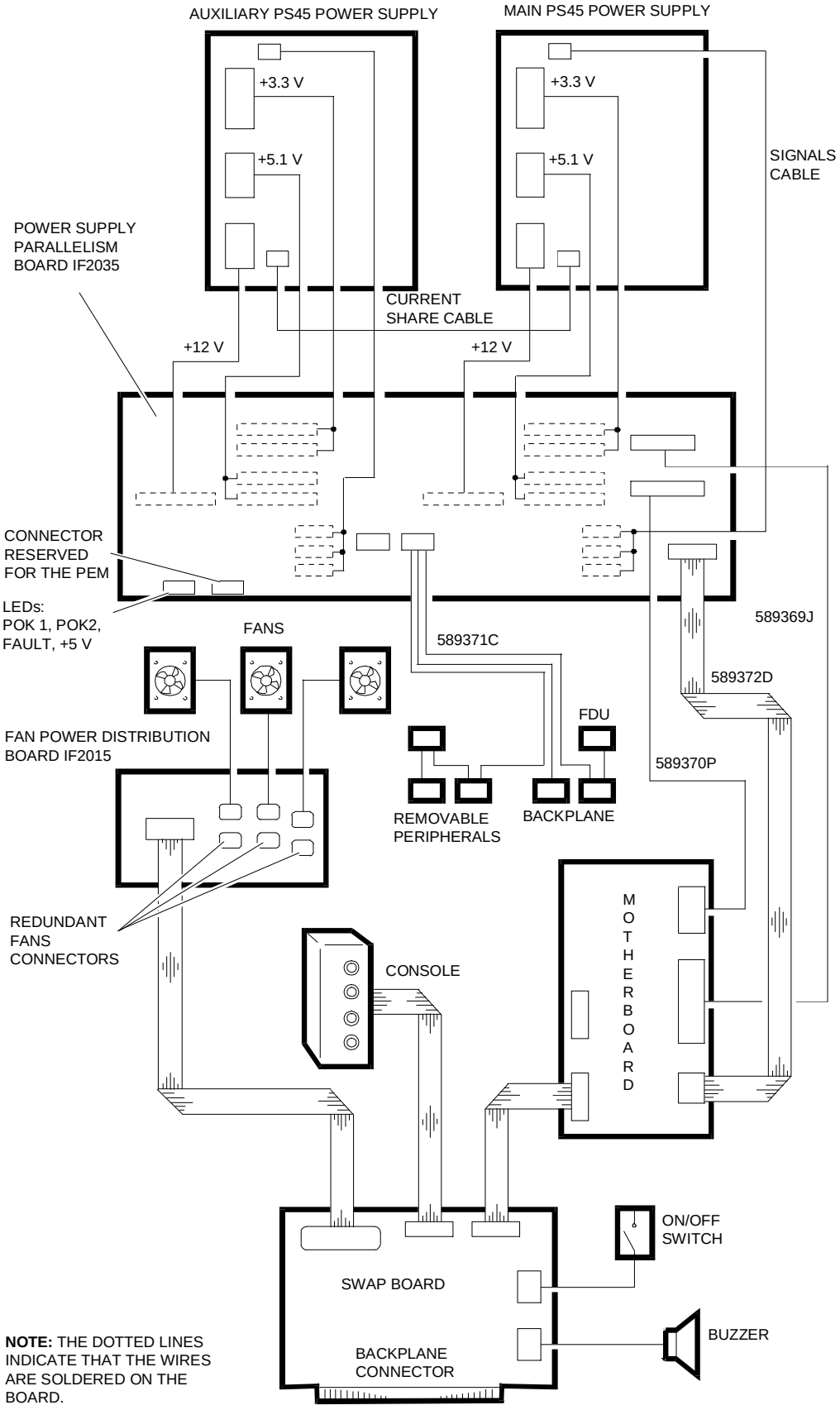
DATE	REL.	REASON FOR CHANGE
6/96	1.0 up1	New User Diagnostics diskette
9/96	1.01	New User Diagnostic diskette release code 2693286 G: - Solves the problems with the HDU_DIA diagnostic in the presence of a DAT connected to the SCSI channel. - Disables the interrupt test of the CPU_DIA diagnostic - CDR_DIA, STR_DIA, DAT_DIA, HDU_DIA, SPCI_DIA link with SCSI library rev. 0.30.
12/96	1.02 upd 1	New User Diagnostic diskette release code 2692140 Q: - Solves the problems with the CPU_DIA diagnostic with 4 CPUs - CDR_DIA, STR_DIA, DAT_DIA, HDU_DIA, SPCI_DIA link with SCSI library rev. 0.32.

SYSTEM TEST EVOLUTION

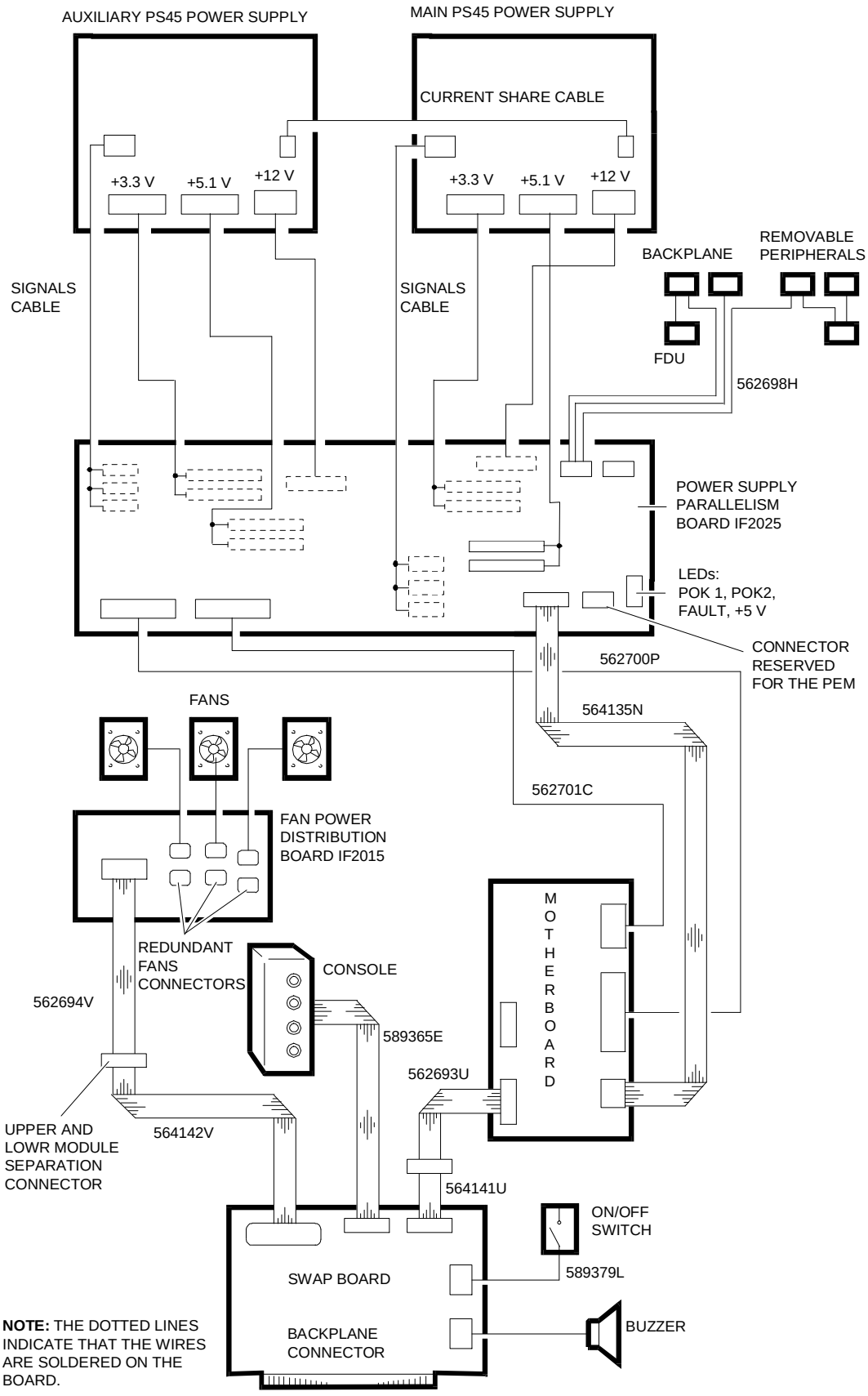
DATE	REL.	REASON FOR CHANGE
6/96	1.01	New System Test.
12/96	1.02	New release.



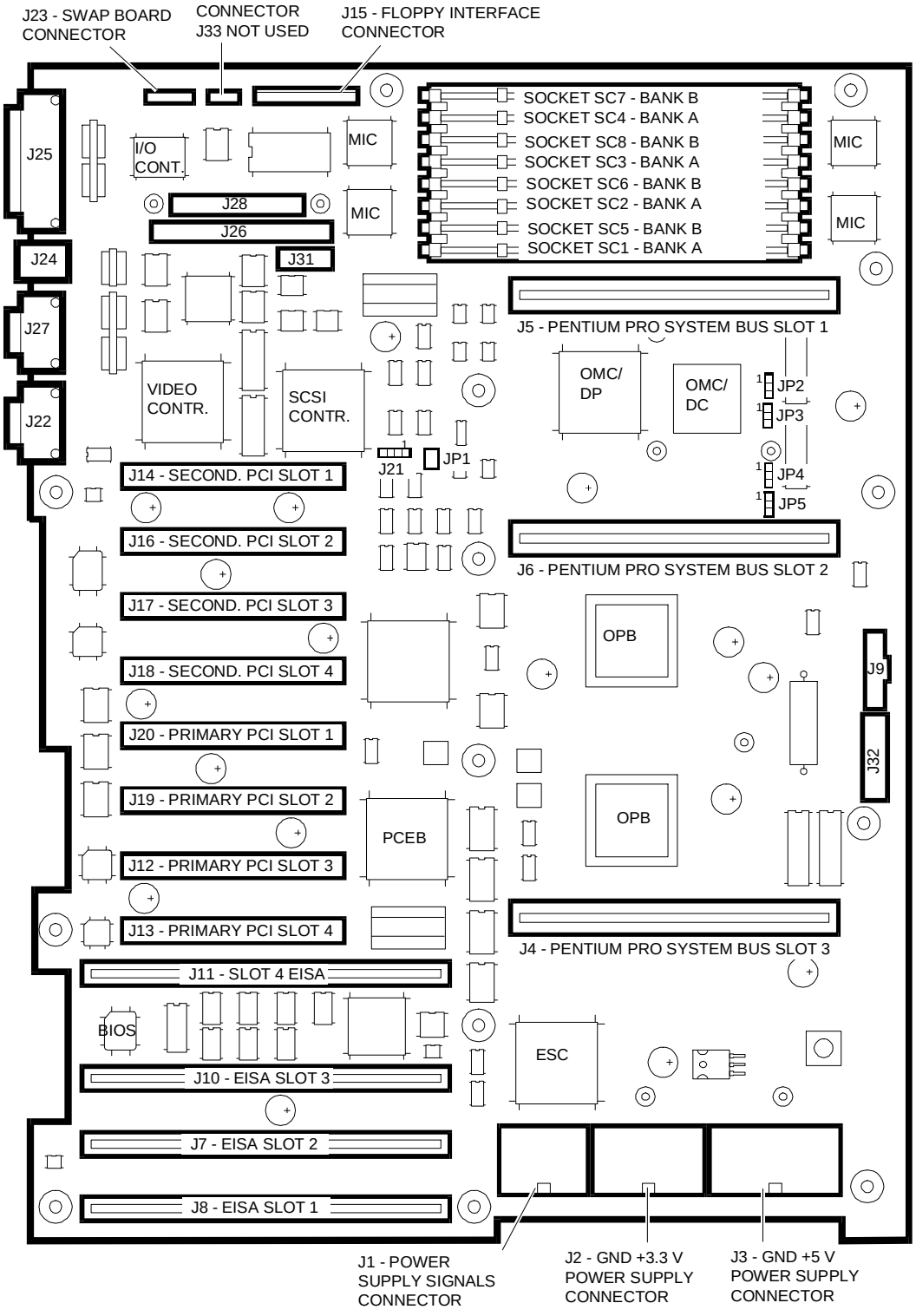
REDUNDANCY



NOTE: THE DOTTED LINES INDICATE THAT THE WIRES ARE SOLDERED ON THE BOARD.


AUXILIARY PS45 POWER SUPPLY
MAIN PS45 POWER SUPPLY
CURRENT SHARE CABLE
+3.3 V
+5.1 V
+12 V
+3.3 V
+5.1 V
+12 V
BACKPLANE
REMOVABLE PERIPHERALS
SIGNALS CABLE
SIGNALS CABLE
FDU
562698H
POWER SUPPLY PARALLELISM BOARD IF2025
LEDs: POK 1, POK2, FAULT, +5 V
CONNECTOR RESERVED FOR THE PEM
562700P
564135N
FANS
562701C
FAN POWER DISTRIBUTION BOARD IF2015
MOTHERBOARD
REDUNDANT FANS CONNECTORS
CONSOLE
562694V
589365E
562693U
UPPER AND LOWR MODULE SEPARATION CONNECTOR
564142V
564141U
ON/OFF SWITCH
589379L
SWAP BOARD
BACKPLANE CONNECTOR
BUZZER
NOTE: THE DOTTED LINES INDICATE THAT THE WIRES ARE SOLDERED ON THE BOARD.

A system is considered as being redundant when it is equipped with a RAID SCSI



controller for HDU management, two power supplies and two fan units; redundancy is managed by the Swap board.
The motherboard is equipped with the following error detection measures:

1 Temperature sensor on the motherboard itself

2 Temperature sensor on the swap board detecting the temperature in the disk area

3 Redundancy failure indication when a fan no longer works

4 Redundancy failure indication when a power supply no longer works.

These error conditions are reported on a specific I/O port on the motherboard. Failures 1-2-4 cause the system to shutdown and power off, in which case the type of failure is stored in a file in the operating system. System failures of this kind are signalled by the SYS FAULT LED on the control panel.

The redundancy kit contains: one PS45 power supply, three slow-type fans (one fan if the kit is intended for a PEM), the power supply parallelism board (IF2025/35 for RS systems, IF2034 for RM systems), one motherboard-power supply parallelism board connection cable, one current share cable and one power cord.

FANS

These systems are equipped with fans NMB 4715KL-04W-26, named B26 (code 564151 W). Fans B26 have an internal temperature sensor that make them turn slowly at environmental temperatures but incrasing their rotational speed as the temperature rises. These fans are compatible with Swap Board IF2012 lev. 03S1 or IF2031 lev 01 and later updates.

The main and redundant fans are always operational. When any one fails, the operator is informed so that the failed fan can be replaced with an identical one (B26). The three main fans are located towards the rear of the system (board area) while the redundant fans are located at the front.
The main and redundant fans are connected through the fan power supply distribution board IF2015.

BOARD IF2015 (P.c.b. Code 654297 B) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
4/95	Nasc	562145 W	The board is introduced.	Factory

POWER SUPPLIES

This system is equipped with the PS45 power supply with which it can also be used in redundant configurations where the main power supply is connected to another PS45. In redundant configurations, both power supplies work at about 50% of their full potential but when one of these fails, the other will automatically cover the activities of the one no longer in use. Both power supplies are simultaneously powered on through the ON/OFF switch which changes the status of the signal that enables power supply operation.
The main and redundant power supplies must be connected using the current share cable so that they both work at about 50 % of their full potential when both are installed.

The power supply parallelism board is required for the connection of the two power supplies. This board parallels the output voltages from the power supply and distributes these to the motherboard and swap board. This board has four red LEDs through which it is possible to keep under control and verify the operation of the entire power supply assembly.

INDICATION	LED	LED STATUS
Normal operation: the FAULT LED is off indicating that both power supplies are working correctly.	+5 V FAULT POK2 POK1	ON OFF ON ON
The FAULT LED is on to indicate the failure of one of the two power supplies. The POK1 LED is off indicating the failure of the first power supply in which case the second power supply is still working correctly.	+5 V FAULT POK2 POK1	ON ON ON OFF
The FAULT LED is on to indicate the failure of one of the two power supplies. The POK2 LED is off indicating the failure of the second power supply in which case the first power supply is still working correctly.	+5 V FAULT POK2 POK1	ON ON OFF ON

Motherboard-Power Supply Parallelism Board Connection Cable

BOARD IF2035 (P.c.b. Code 654394 C) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
3/95	Nasc	562408 F	New board replacing the IF2025 and including its wirings.	Factory

BOARD IF2034 (P.c.b. Code xxxxxx) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
7/95	Nasc	562407 W	New board for PEM RM systems.	Factory

ELECTRICAL CONNECTIONS ON REDUNDANT RS SYSTEMS

ELECTRICAL CONNECTIONS ON REDUNDANT RM SYSTEMS

MOTHERBOARD BA2263 / BA2323 / BA2310

J25	Parallel interface connector and external SCSI Narrow connector	J28	Internal SCSI Wide connector
J24	Keyboard connector (top), mouse (bottom)	J26	Internal SCSI Narrow connector
J27	COM1 port (top) and COM2 (bottom)	J31	Oliswap connector (not used)
J22	VGA video interface connector	J9	Debugging connector (not used)
		J32	Hobbes Card connector (not used)

JUMPERS

CONFIGURATION JUMPER	
JP1	**DESCRIPTION**
ON	The system is set as defined by the default configuration. The configuration stored in CMOS RAM is ignored and therefore all security features.
OFF *	Normal setting, at power on the system is set as defined by the configuration stored in CMOS RAM.

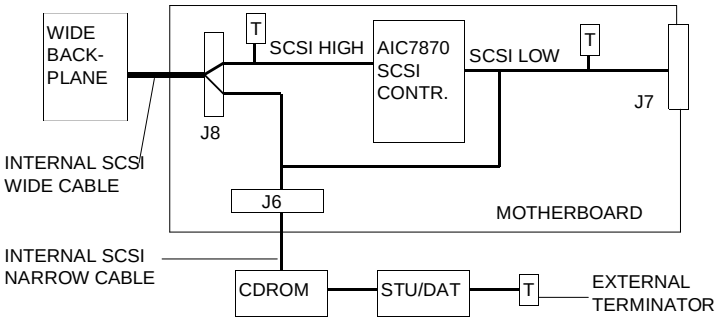
PENTIUM PRO SYSTEM BUS CLOCK SELECTION JUMPER	
J21	**DESCRIPTION**
PINs 1-2 ON * PINs 2-3 ON PINs 3-4 ON	66.6 MHz - setting to be used 60 MHz - not used 50 MHz - not used

PENTIUM PRO INTERNAL CLOCK SELECTION JUMPERS							
JP2	**JP3**	**JP4**	**JP5**	**CLOCK SYSTEM BUS**	**MOLT.**	**PENTIUM PRO FREQ.**	**NOTES**
2-3	2-3	2-3	2-3	66.6 MHz	2 x	133 MHz	Not used
1-2	2-3	2-3	2-3		3 x	200 MHz	For SNX 460 - 200 MHz
2-3	1-2	2-3	2-3		4 x	266 MHz	Not used
1-2	1-2	2-3	2-3		5 x	333 MHz	Not used
2-3	2-3	1-2	2-3		2.5 x	166 MHz	For SNX 460 - 166 MHz
1-2	2-3	1-2	2-3		3.5 x	233 MHz	Not used
2-3	1-2	1-2	2-3		4.5 x	300 MHz	Not used
1-2	1-2	1-2	2-3		5.5 x	366 MHz	Not used

MEMORY EXPANSION

On the motherboard there are eight sockets, two banks, reserved for the installation of 3.3 V ECC DIMMs that provide the system memory.

Listed below are the rules to follow when configuring memory on this system:



- The system sees onboard memory as being divided into two banks (A and B). Each bank consists of four sockets. Bank A has sockets SC1, SC2, SC3, SC4 while Bank B has sockets SC5, SC6, SC7, SC8.
- Four DIMMs must be installed at a time in order to fill a memory bank.

- The DIMMs in the same bank must all be of the same capacity.
- Although not in the same bank, the system can be configured with DIMMs of different capacitites.
- The banks must be filled in order starting from Bank A. In the minimum system memory capacity, Bank A is totally filled while Bank B is empty.
- The minimum memory configuration is 32 MB expandible to 1024 MB.
- There are no jumper settings to be made to configure system memory; any memory expansion DIMMs added are automatically recognized by activating the ECU or the BIOS Setup Utility.

The following ECC DIMMs are to be used:

PDG NAME	CAPACITY	MEMORY EXPANSION KIT
EXM 3V008	8 MB	One 1 MB x 72-bit, 60 ns, 3.3 V DIMM. Four kits need to be ordered to fill a bank.
EXM 3V016	16 MB	One 2 MB x 72-bit, 60 ns, 3.3 V DIMM. Four kits need to be ordered to fill a bank.
EXM 3V032	32 MB	One 4 MB x 72-bit, 60 ns, 3.3 V DIMM. Four kits need to be ordered to fill a bank.
EXM 3V032S	32 MB	One 4 MB x 72-bit, 60 ns, 3.3 V DIMM. Four kits need to be ordered to fill a bank.
EXM 3V064	64 MB	One 8 MB x 72-bit, 60 ns, 3.3 V DIMM. Four kits need to be ordered to fill a bank.
EXM 3V128	128 MB	One 16 MB x 72-bit, 60 ns, 3.3 V DIMM. Four kits need to be ordered to fill a bank.

The following table lists the memory configurations supported by the Orion 82450 GX step B0 chipset. The configurations that are currently not supported will be with the successive Orion chipset step C0

TOTAL MEMORY	BANK A SOCKETS				BANK B SOCKETS			
	SC1	SC2	SC3	SC4	SC5	SC6	SC7	SC8
32 MB	8 MB	8 MB	8 MB	8 MB				
64 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB
64 MB	16 MB	16 MB	16 MB	16 MB				
128 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB
128 MB	32 MB	32 MB	32 MB	32 MB				
256 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
256 MB	64 MB	64 MB	64 MB	64 MB				
320 MB	64 MB	64 MB	64 MB	64 MB	16 MB	16 MB	16 MB	16 MB
512 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB
512 MB	128 MB	128 MB	128 MB	128 MB				
576 MB	128 MB	128 MB	128 MB	128 MB	16 MB	16 MB	16 MB	16 MB
768 MB	128 MB	128 MB	128 MB	128 MB	64 MB	64 MB	64 MB	64 MB
1024 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB

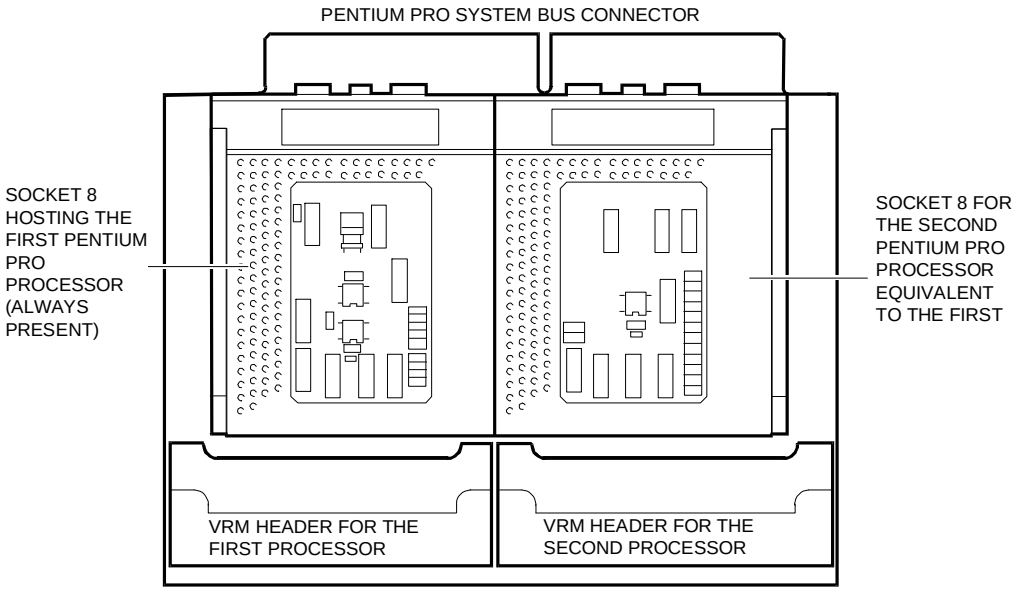
VIDEO CONTROLLER

The Trident TGUI 9440 video controller with a 1 MB RAM is embedded on the onboard EISA bus. The following table lists all the supported video modes.

Mode	Type	Resolution (Pixel)	Color	Char. Format	Page Format	Pixel Clock	Vertical Refresh
00/01 (CGA)	A/N	320 x 200	16 among 256 K	8 x 8	40 x 25	25.2 MHz	70 Hz
00/01 (EGA)	A/N	320 x 350	16 among 256 K	8 x 14	40 x 25		
00/01	A/N	320 x 400	16 among 256 K	9 x 16	40 x 25	28.3 MHz	
02/03 (CGA)	A/N	640 x 200	16 among 256 K	8 x 8	80 x 25	25.2 MHz	
02/03 (EGA)	A/N	640 x 350	16 among 256 K	8 x 14	80 x 25		
02/03	A/N	720 x 400	16 among 256 K	9 x 16	80 x 25	28.3 MHz	
04/05	APA	320 x 200	4 among 256 K	8 x 8	40 x 25	25.2 MHz	
06	APA	640 x 200	2 among 256 K	8 x 8	80 x 25		
07 (EGA)	A/N	720 x 350	monochrome	8 x 8	40 x 25	28.3 MHz	
07	A/N	720 x 400	monochrome	9 x 16	80 x 25	25.2 MHz	
OD	APA	320 x 200	16 among 256 K	8 x 8	40 x 25		
OE	APA	640 x 200	16 among 256 K	8 x 8	80 x 25		
OF	APA	640 x 350	monochrome	8 x 14	80 x 25		
10	APA	640 x 350	16 among 256 K	8 x 14	80 x 25		
11	APA	640 x 480	2 among 256 K	8 x 16	80 x 25		60 Hz
12	APA	640 x 480	16 among 256 K	8 x 16	80 x 25		
13	APA	320 x 200	256 among 256 K	8 x 8	40 x 25		70 Hz
14	A/N	1056 x 400	16 among 256 K	8 x 16	132 x 25	41.5 MHz	
54	A/N	1056 x 400	16 among 256 K	8 x 16	132 x 25		
55	A/N	1056 x 350	16 among 256 K	8 x 14	132 x 25		
58.6A	APA	800 x 600	16 among 256 K	8 x 16	100 x 37	36 MHz	56 Hz
58.6A	APA	800 x 600	16 among 256 K	8 x 16	100 x 37	40 MHz	60 Hz
58.6A	APA	800 x 600	16 among 256 K	8 x 16	100 x 37	50 MHz	72 Hz
5C	APA	800 x 600	256 among 256 K	8 x 16	100 x 37	36 MHz	56 Hz
5C	APA	800 x 600	256 among 256 K	8 x 16	100 x 37	40 MHz	60 Hz
5C	APA	800 x 600	256 among 256 K	8 x 16	100 x 37	50 MHz	72 Hz
5Di	APA	1024 x 768	16 among 256 K	8 x 16	128 x 48	44.9 MHz	87i Hz
5D	APA	1024 x 768	16 among 256 K	8 x 16	128 x 48	65 MHz	60 Hz
5D	APA	1024 x 768	16 among 256 K	8 x 16	128 x 48	75 MHz	70 Hz
5D	APA	1024 x 768	16 among 256 K	8 x 16	128 x 48	77 MHz	72 Hz
5F	APA	640 x 480	256 among 256 K	8 x 16	80 x 30	25 MHz	60 Hz
5F	APA	640 x 480	256 among 256 K	8 x 16	80 x 30	31.5 MHz	72 Hz
60i	APA	1024 x 768	256 among 256 K	8 x 16	128 x 48	44.9 MHz	87i Hz
60	APA	1024 x 768	256 among 256 K	8 x 16	128 x 48	65 MHz	60 Hz
60	APA	1024 x 768	256 among 256 K	8 x 16	128 x 48	75 MHz	70 Hz
60	APA	1024 x 768	256 among 256 K	8 x 16	128 x 48	77 MHz	72 Hz
64	APA	640 x 480	64 K	-	-	25 MHz	60 Hz
64	APA	640 x 480	64 K	-	-	31.5 MHz	72 Hz
65	APA	800 x 600	64 K	-	-	36 MHz	56 Hz
65	APA	800 x 600	64 K	-	-	40 MHz	60 Hz
66	APA	640 x 480	32 K	-	-	25 MHz	60 Hz
66	APA	640 x 480	32 K	-	-	31.5 MHz	72 Hz
67	APA	800 x 600	32 K	-	-	36 MHz	56 Hz
6Ci	APA	1280 x 1024	16 among 256 K	8 x 16	160 x 64	75 MHz	87i Hz
6F	APA	320 x 200	64 K	8 x 8	40 x 25	12.5 MHz	70 Hz
70	APA	320 x 200	16 M	8 x 8	40 x 25	12.5 MHz	70 Hz
71	APA	640 x 480	16 M	8 x 16	80 x 30	25 MHz	60 Hz

SCSI CONTROLLER

The SCSI controller embedded on the motherboard is implemented on the secondary PCI



bus and provides a fast single-ended SCSI Wide (16-bit) channel based on the Adaptec AIC7870 (Lance) controller. This chip is a bus master interface controller that can take control of the bus and transfer information from the system memory at the maximum speed allowed on the PCI bus (133 MB/sec), while the data is transferred from/to the SCSI bus at 20 MB/sec since 16-bit (Wide) transfers are involved instead of 8-bit (Narrow). The Lance controller also supports the standard 8-bit Narrow peripherals.

This board has the following connectors:

- Internal 68-pin high density Wide connector J28 used for connecting the SCSI Wide internal HDUs through the SCSI Wide backplane.
- Internal 50-pin Narrow connector J26 used for connecting the internal SCSI Narrow removable peripherals.
- Internal 50-pin high density Narrow connector J25 used for connecting external SCSI Narrow peripherals, PEM excluded.

The peripherals cannot be connected to all three SCSI connectors at the same time. The maximum configuration allows the simultaneous connection to two of the three connectors: to both internal connectors (Wide and Narrow), to the internal Narrow and external Narrow connectors, or to the internal Wide and external Narrow connectors.
Up to 16 SCSI devices can be connected to the SCSI Wide channel, controller included. These devices can be assigned with SCSI IDs from 0 to 15, but this system only uses SCSI IDs from 0 to 7. The SCSI controller ID must always be set to 7 by means of the ECU.
The SCSI terminators are on the motherboard and are active. The terminators on the high part of the Wide bus are always enabled while those on the low part of the bus, shared between Wide and Narrow, are ususlly enabled but are automatically disabled if connections are made to two of the three onboard SCSI connectors.

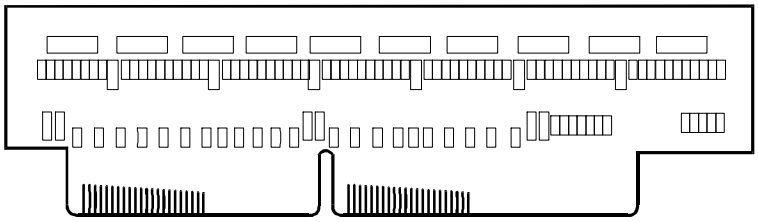
The controller is configured by means of the ECU and in the same way as described for the GO2109 Lance SCSI controller in Appendix C. There are no SCSI configuration

jumper settings to be made on the motherboard.
The rules for configuring the SCSI channel on the SNX 460 are described in Appendix J.

The following block diagram shows the SCSI channel path.

SEQUENCE OF BOARDS INSTALLED IN THE MOTHERBOARD SLOTS

Board Name	Max. No. of Boards	Slot	Connector
PENTIUM PRO SYSTEM BUS			
First CPU board (always present)	1	Slot 1	J5
memory expansion board ME2047	1	Slot 2	J6
Second CPU board or system bus termination board	1	Slot 3	J4
PRIMARY PCI BUS			



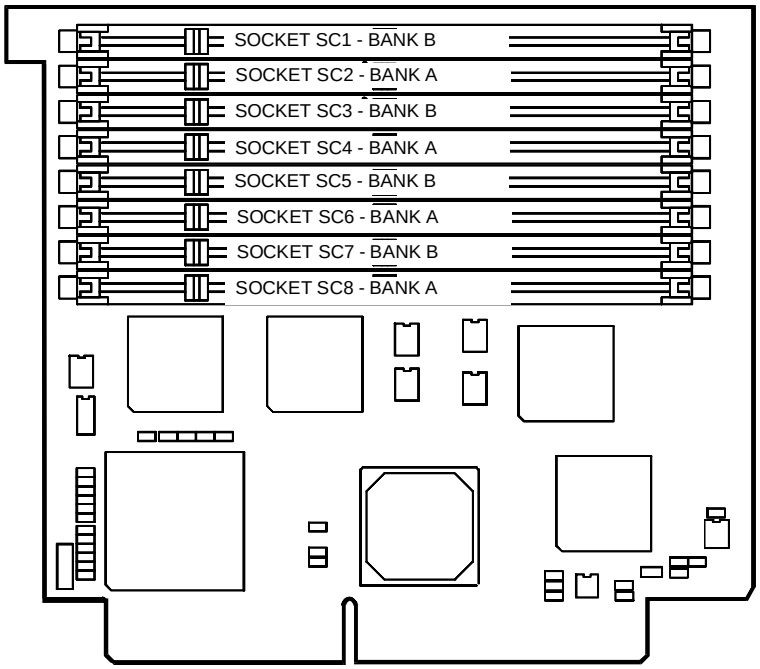
PENTIUM PRO SYSTEM BUS CONNECTOR

Full size PCI board	3	Slot 1	J20
		Slot 2	J19
		Slot 3	J12
Half size PCI board (PCI/EISA shared slot)	1	Slot 4	J13
SEONDARY PCI BUS			
Full size PCI board	3	Slot 1	J14
		Slot 3	J17
		Slot 4	J18
Half size PCI board	1	Slot 2	J16
EISA BUS (All bus master slots)			
Full size EISA board	2	Slot 1	J8
		Slot 2	J7
Full size EISA board when the 2nd CPU board is not present Half size EISA board when the 2nd CPU board is present	1	Slot 3	J10
Half size EISA board (PCI/EISA shared slot)	1	Slot 4	J11

Notes:

- *If a second processor is to be installed on a base system equipped with only one processor, it is suggested to install the processor on the CPU board plugged into slot 1instead of installing a second CPU board in slot 3.*
- *When installing a second CPU board to obtain a system with three or four processors, remove the terminator board from slot 3 and plug the CPU board into this slot.*
- *Since a terminator board or a CPU board is always installed in slot 3 of the Pentium PRO system bus, only half-size boards can be installed in the PCI/EISA shared slot.*
- *If the system is equipped with a memory expansion board with 16 MB x 72 or 8 MB x 72 DIMMs, only two full size boards can be installed into slots 1 and 4 of the secondary PCI bus and two half size boards into slots 2 and 3 of this same bus.*
- *The primary and secondary PCI buses are identical and have the same priority.*

- *The primary PCI slot 4 (J13) and the EISA slot 4 (J11) are considered as a single, shareable slot since being very physically close together they can accommodate a single board; in the case of a PCI*



board it must be plugged into the PCI slot, while EISA, ISA or P&P ISA boards must be plugged into the EISA slot.

- *There are no priorities as far as the free PCI and EISA slots are concerned.*

BOARD BA2263 (P.c.b. Code 654475 D - 654475 D-01) EVOLUTION

DATE	LEV.	REV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
6/96	Nasc	G	210816 S	New board. The first BIOS release is 1.0 code 212666 H lev Nasc. The BIOS evolutions are described further on.	Factory
7/96	01			Memory expansion board support. Make 8 wirings on p.c.b. 654475 D, 3 wirings on p.c.b. 654475 D-01.	Factory
11/96	01AG			Unstable contact between the pins of the PCI connectors and the test equipment. Replace short pin PCI connector J49Y in positions J2-J13-J14-J16-J17-J18 J19-J20 with long pin PCI connector J49D.	Factory

BOARD BA2323 (P.c.b. Code 654475 D) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
12/96	Nasc	212857 Z	New board that replaces the BA2263. The difference between the two boards concerns the chipset which, even though being functionally the same, is provided by a different supplier. This board will be included in production when the stock of BA2263 boards runs out.	Factory
1/97	01		Missing Adaptec AIC7870 component. Replace component AIC7870 in pos. U41 with component AIC7880. Board functions do not change since the AIC7880 is hard-wired so as to work in the Fast Wide mode only. The systems manufactured with the new 7880 must be equipped with BIOS rel 2.03 and must be included in the Orchestra rel 1.6 Starter Kit. In case of the installed base equipped with component 7870 which, for repair or replacement purposes, are updated with component 7880 and in the event that NT 3.51 needs to be also reinstalled, the 1.21L SCSI driver will need to be reloaded.	Factory

BOARD BA2310 (P.c.b. Code 654535 Z) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
2/97	Nasc	212784 Y	New board to replace the BA2323 and equipped with the new ORION step C0 chipset which supports all the possible motherboard memory configurations. This board will be used when the stock of BA2323 boards runs out.	Factory

Note: *From July 1996, due to the difficulty in fitting spring code 4879085 X on the heatsink, the mylar protection is removed and the spring replaced with a new one code 4879088 U.*

BIOS WE48 EVOLUTION FOR THE BA2263/2323/2310

DATE	LEV.	BIOS	CODE	REASON FOR CHANGE
6/96	Nasc	1.0 WE48	212666 H	New BIOS. Compatible levels are: Motherboard P2.0, Rev. G or later, CPU board P1.0 or later, Keyboard controller 8.50 or latere. This BIOS release does not support the SAR feature. The "FEPROM_UTILITY_SNX460 - r1.01" utility is required to flash BIOS 1.0.
10/96	01	2.02 WE48		New BIOS release: - Reset signal management on the PCI bus - New approximate 15 sec. delay in clearing the cache memory of the DPT board following a shutdown from Windows NT. - Introduction of the SAR feature. BIOS rel. 2.02 must be associated with release 1.02 of the Configuration Utility contained in the Orchestra 1.5 CD-ROM. To be able to use the SAR feature, a complete Starter Kit which includes Orchestra rel. 1.5 is required.
2/97	02	2.03 WE48		New BIOS release: - Incorrect management of the processor APIC. - Solves the problems with memory capacities that are not the power of 2. BIOS rel 2.03 must be associated to release 1.03 of the Configuration Utility contained in the Orchestra 1.6 CD-ROM.
2/97	03	2.05 up1 WE48		New BIOS release: - Correct management of the year 2000 - Removal of the ROM Setup Utility - Management of the Pentium PRO Step B1 CPU
3/97	04	2.06 WE48		New BIOS release for the management of memory expansion board ME2047. In addition to BIOS release 2.06, Configuration Utility release 1.04, distributed on a diskette provided in the board kit, is required for the management of this mamory board.

GO2065-166 (SNX 460/RS/RM 166), GO2065-200 (SNX 460/RS/RM 200) CPU BOARD

Notes:

- *The name of board GO2065 remains the same for the 166 and 200 MHz versions. For simplicity, this guide distinguishes the two board versions as GO2065-166 and GO2065-200.*
- *In the system there is always at least one CPU board with one or two Pentium PRO processors installed. The maximum configuration allows for two CPU boards for a total of four processors.*
- *Upgrading a monoprocessor system into a dualprocessor system consists of adding a processor on an existing CPU board; the addition of a second CPU board with only one processor installed is not possible. Triprocessor systems are always equipped with two CPU boards.*
- *The 66.6/166 MHz GO2065-166 CPU board is identical to the GO2065-200 with the exception of the type of processor fitted (it uses a 200 MHz Pentium PRO instead of a 166 MHz Pentium PRO).*
- *Boards with different processors, in other words a GO2065-166 and GO2065-200, cannot be installed on the same system. Also, the processors on each board must be identical.*

This CPU board has two Socket 8s for processors and two VRM Header connectors, one for each processor, which are used for installing an AL2023 VRM (code 210813 X) so that the processors can be powered separately.
The VRMs must be installed for each Pentium PRO processor present in the system; the shorting block will not be connected. The VRM provides the power supply as requested by the processor, drawing it from the +5 V; the output voltage is within the 2.1 to 3.5 V range, the maximum current supplied is 11.4 A.

Both primary and secondary processors are cooled down by a passive heatsink.

There are no jumper settings to be made on the board; the second processor and the second CPU board are automatically recognized by the BIOS during system power on. The selection of the processor's internal clock is made using four jumpers on the motherboard, and the value set applies to all the processors.

BOARD GO2065 (P.c.b. Code 654353 J) EVOLUTION

DATE	LEV.	REV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
6/96	Nasc	E	562273 E	New CPU board with an Intel Pentium PRO 166/512 Step B0 for the SNX 460/RS/RM 166 or Intel Pentium PRO 200/512 Step B0 for the SNX 460/RS/RM 200 and NetStrada 7000.	Factory

Note: *Since February 1997 Intel is no longer producing the PPRO Step B0 processors. Therefore when the stocks are cleared, the PPRO 166/512 Step B1 code 4893199A and PPRO 200/512 Step B1 code 4893196M will replace the Step B0 processors. Systems equipped with the Step B1 processor must have BIOS release >= 2.05up1 which correctly recognizes the new step version.*

TERMINATOR BOARD MI2100

The Pentium PRO system bus must be terminated at its ends (slots 1 and 3). The bus is terminated when two CPU boards are present since each CPU board is also equipped with terminators.

In configurations where there is only one CPU board plugged into slot 1, for the bus to be properly terminated the terminator board MI2100 must be plugged into slot 3 of the Pentium PRO system bus.

BOARD MI2100 (P.c.b. Code 654440 N) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
6/96	Nasc	210722 B	New board.	Factory

MEMORY EXPANSION BOARD ME2047

This board can host up to 1024 MB of RAM so system memory can be expanded from 1024 MB to 2048 MB (2 GB). It must be plugged into the Pentium Pro system bus slot 2 on the motherboard.

On the board there are eight sockets, two banks, reserved for the installation of 3.3 V ECC DIMMs that are identical to the ones installed on the motherboard.

The controller on this board is the Orion Memory Controller (OMC), which is already present on the motherboard and which consists of six chips.

Listed below are the rules to follow when configuring memory:

- The system sees the memory on the board as being divided into two banks (A and B). Each bank consists of four sockets. Bank A has sockets SC8, SC6, SC4, SC2 while Bank B has sockets SC7, SC5, SC3, SC1.
- Four DIMMs must be installed at a time in order to fill a memory bank.
- The DIMMs in the same bank must all be of the same capacity.
- The two banks can be filled with DIMMs of different capacitites.
- The banks must be filled in order starting from Bank A.
- The minimum memory configuration is 32 MB expandible to 1024 MB.
- Before the memory expansion board can be used, at least bank A on the motherboard must be filled.

There are no jumper settings to be made to configure system memory; any memory expansion DIMMs added are automatically recognized by the configurator when the system is powered on.

Note: *Following are the prerequisites to ensure the operation of the memory expansion board:*
- System BIOS release 2.06 or later.
- Configuration Utility rel. 1.04 that allows the management of up to 2 MB of system memory. The configurator comes on a diskette provided in the MEM 7000 kit, and on Orchestra rel. 1.7.
The memory board is also compatible with the motherboard equipped with the ORION Step B0 chipset.

The following table gives some of the possible memory configurations supported.

TOTAL MEMORY	BANK A SOCKETS				BANK B SOCKETS			
	SC8	SC6	SC4	SC2	SC7	SC5	SC3	SC1
32 MB	8 MB	8 MB	8 MB	8 MB				
64 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB
64 MB	16 MB	16 MB	16 MB	16 MB				
96 MB	16 MB	16 MB	16 MB	16 MB	8 MB	8 MB	8 MB	8 MB
128 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB
128 MB	32 MB	32 MB	32 MB	32 MB				
160 MB	32 MB	32 MB	32 MB	32 MB	8 MB	8 MB	8 MB	8 MB
192 MB	32 MB	32 MB	32 MB	32 MB	16 MB	16 MB	16 MB	16 MB
256 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
256 MB	64 MB	64 MB	64 MB	64 MB				
288 MB	64 MB	64 MB	64 MB	64 MB	8 MB	8 MB	8 MB	8 MB
320 MB	64 MB	64 MB	64 MB	64 MB	16 MB	16 MB	16 MB	16 MB
384 MB	64 MB	64 MB	64 MB	64 MB	32 MB	32 MB	32 MB	32 MB
512 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB
512 MB	128 MB	128 MB	128 MB	128 MB				
544 MB	128 MB	128 MB	128 MB	128 MB	8 MB	8 MB	8 MB	8 MB
576 MB	128 MB	128 MB	128 MB	128 MB	16 MB	16 MB	16 MB	16 MB
640 MB	128 MB	128 MB	128 MB	128 MB	32 MB	32 MB	32 MB	32 MB
768 MB	128 MB	128 MB	128 MB	128 MB	64 MB	64 MB	64 MB	64 MB
1024 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB

BOARD ME2047 (P.c.b. Code 654549 P) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
2/97	Nasc	212716 T	New board with the Orion Memory Controller Step C0 board.	Factory

NOTES AND LIMITATIONS

CONFIGURATION

- If the user decides not to use some of the HDUs installed in the system and removes them from the rack, the HDUs need to be completely removed to avoid that the HDU slide-in supports cause the loss of the hot swapping feature.
- BIOS release 1.0 on the first series machines does not support the SAR (Systema Automatic Restart) feature.
- The Hot Spare feature is not supported.
- The Panasonic 4X CR-ROM model needs to be used; there are read problems with the Sony 76S, no longer in production.
- In case different SCSI controllers (DPT or Lance) are installed, it is suggested to install half of these on the primary PCI bus and the other half on the secondry PCI bus.
- If an optional board equipped with a PCI-to-PCI bridge is installed on the primary or secondary PCI bus, the onboard secondary PCI bus is not recognized as the secondary bus but as the third one while the PCI bus on the optional board is recognized as the secondary. In this way the PCI buses are recognized during configuration and in the event of error messages.
- When configuring PCI LAN boards, run the Configuration Utility and make sure that I/O addresses of these boards are not located at ISA addresses or related aliases (for example 500H, 600H, 700H).
- Whenever the Configuration Utility is used and the system is equipped with a RAID DPT SCSI Wide controller, the I/O port address of this controller but be set at FC00H. During the successive boot and with other boards installed in the slots of the PCI bus, ignore if an I/O port address different than FC00H may be displayed for the DPT controller during the power on diagnostics.
- If the user types the password incorrectly, the correct password will need to be typed twice.
- To avoid problems with the Configuration Utility, do not configure the DPT board at I/O address FC88H.
- Do not use IRQ14 for the DPT controller.
- With User Diagnostic 1.00 upd 1, the message "run-time error -R6001" is displayed after the CPU_DIA test and before the successive test. This message does not cause any functional problem and is only displayed in quadriprocessor configurations.
- Since there is no 128 KB memory gap between 512 and 640 KB in mega 0 of basic memory, the DPM boards cannot be mapped in that area.
- Do not use the "List" option of the Z'NYX board diagnostics.

OPERATING SYSTEMS

- The SCO UNIX 3.2.4.2 and OS/2 operating systems do not handle the secondary PCI bus and therefore the PCI boards must be installed on the primary PCI bus. Being the onboard Lance controller connected to the secondary PCI bus, it cannot be used with these operating systems. Therefore in order to be able to connect SCSI peripherals, the Lance GO2109 controller needs to be ordered and installed on the primary bus.
- The RAID DPT controller must always be installed on the secondary PCI bus for all operating systems except IBM OS/2 and SCO 3.2.4.2. In case a PCI board is already installed in the slots in which the DPT board(s) have to be installed, the PCI board will need to be moved to another slot.

- With identical SCSI controllers installed and under the SCO 3.2.4.2 and SCO Open 5.0 operating systems, the boot CD-ROM and HDU must be connected to the same SCSI channel. This limitation does not apply for different controllers, for example a Lance and DPT controller.
- These systems do not support the SCO UNIX 3.2.4.2 operating system in the multiprocessor version. This is due to the fact that 3.2.4.2 is not compatible with the MPS 1.4 standard, made available on Condor for Multi PCI Bus support.
  SCO Open 5.0 is, instead, compatible.
- The new Adaptec driver provided by SCO is required in order to correctly install the current version of UnixWare 2.1. This problem can be bypassed by disabling the secondary cache during the installation phase and then re-enabling it later on.
- When more than two PCI LAN boards are installed in the NetWare environment, the I/O addresses may have to be configured manually.
- At the end of the BIOS replacement procedure on the Flash EPROM, activate the configurator and select the following entries in this order: Configure System, Standard Configuration, View or Edit Details, Primary Operating System.
  The "Unix, Novell, Windows NT, OS/2, Other" parameter displayed must be set to "Multi-processor" for all operating systems, single or multiprocessor, with the exception of single processor UNIX operating systems in which case it must be set to "Single-processor". The default setting is "Multi-processor".

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