NetStrada 5000 (OLIMPUS)

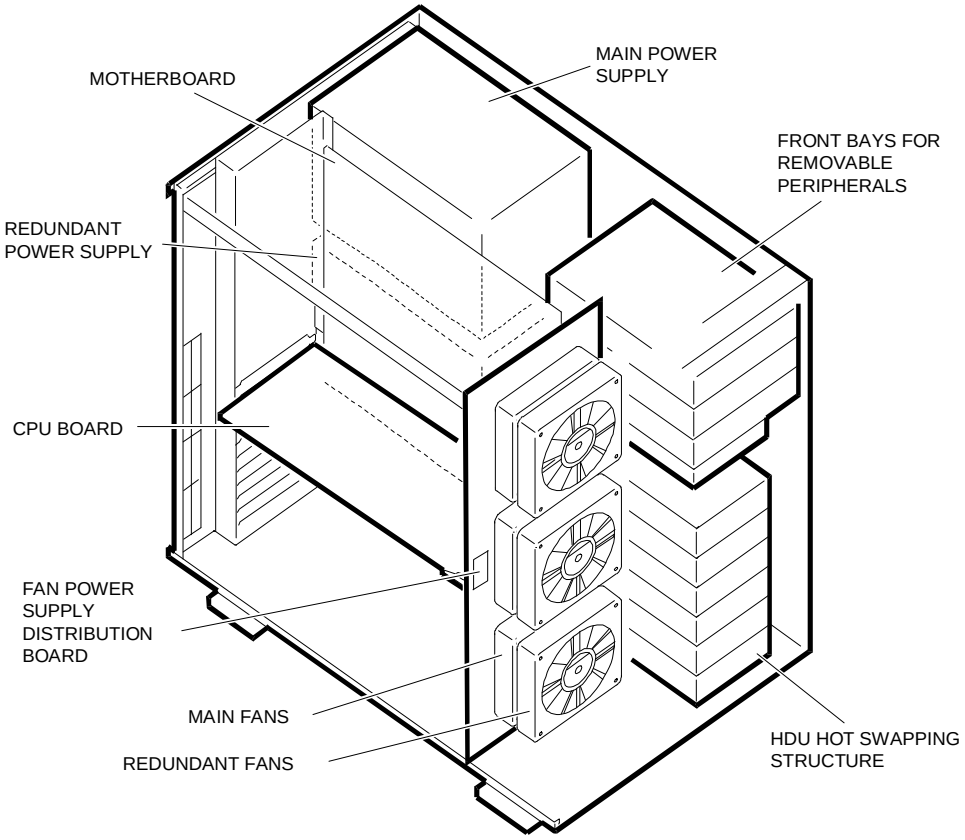
CHARACTERISTICS

Microprocessor	200/66 MHz Intel PENTIUM PRO installed in Socket 8
Dualprocessor	Possibility of adding a second optional processor, identical to the first, on the CPU board. This second processor is installed in a ZIF socket adjacent to the one in which the first processor is installed, thus creating a dualprocessor system.
Chipset	Intel Natoma
Bus architecture	- 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	One specific for the CPU board, two primary PCI, three secondary PCI, three EISA, one double EISA/PCI
Cache	256 KB or 512 KB of second level cache integrated in each Pentium PRO
ECC RAM	32 MB to 1024 MB (using 3.3 V DIMMs)
Cabinet	**NetStrada 5000 Silver:** SILVER Wide box **NetStrada 5000 Rack:** 19" Wide RACK 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 Ultra Wide controller for the HDUs and the onboard Lance controller for the removables. The particular structure of the SILVER and RACK cabinets, in association with HDU redundancy (RAID-1 and RAID-5), allows the host swapping of HDUs and the automatic reconstruction of the data on the new hard disk.
Configuration of non-resilience systems	With the Ultra Wide SCSI controller for the HDUs and the onboard SCSI Lance for the removables. HDU hot swapping is not supported.
Redundant systems	Possiblity of redundant basic module and PEM configurations consisting of two power supplies 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 Wide controller and therefore the HDUs can always be hot swapped. Up to four PEMs can be connected to the system.
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.

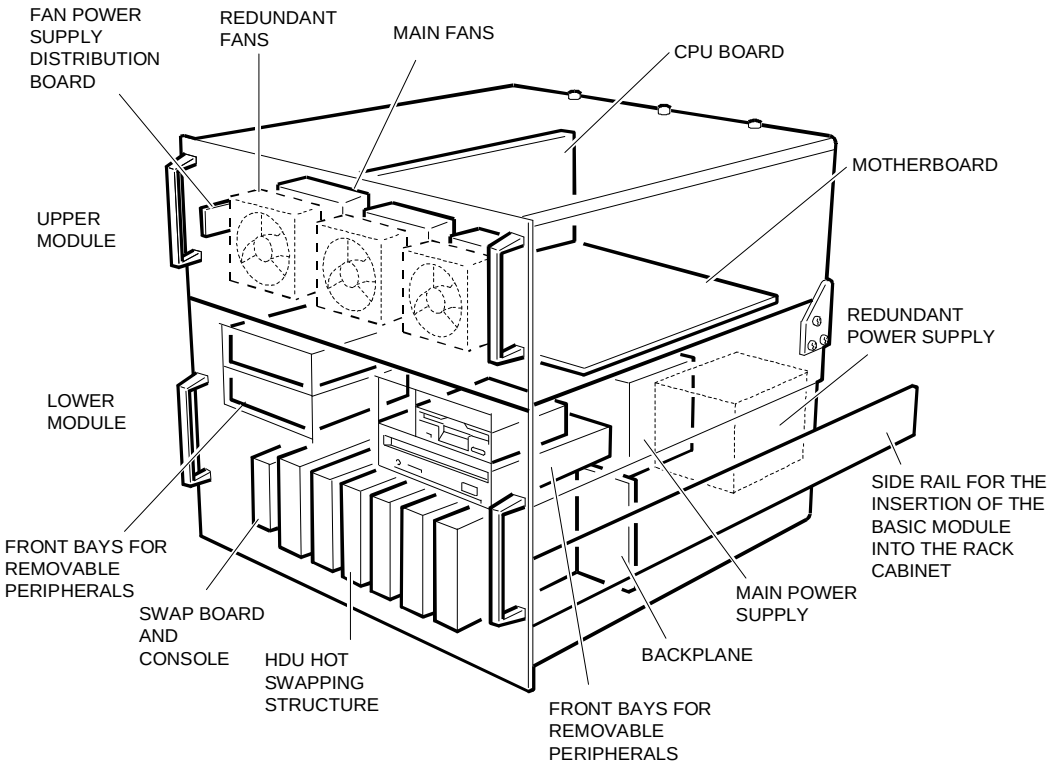
Note: *The systems in a 19" rack differ from those in a Silver box for the possibility of being hosted in a Rack module which also contains other components such as monitor, keyboard, UPS, PEM.*

Note: *The commercial name of the NetStrada 5000 remains unchanged for the standard and rack-mount versions. For simplicity and whenever necessary, this guide will distinguish between these versions as follows:*
- Netstrada 5000 Silver
- Netstrada 5000 Rack

NETSTRADA 5000 SILVER BASIC MODULE



NETSTRADA 5000 RACK BASIC MODULE



7

UPDATE LEVELS OF THE MAIN COMPONENTS ON THE FIRST SERIES NETSTRADA 5000 MODELS

MOTHERBOARD BA2320 lev. Nasc	**CPU BOARD** UC2007 lev. Nasc	**BIOS** Rel. 1.04
RAID DPT SCSI CONTR. GO2173 lev. Nasc FW 7H0	**POWER SUPPLY** PS45 lev. 03	**ORCHESTRA rel. 1.6** Conf. 1.05, Diagn. 1.04
SYSTEM TEST Rel. 1.04		

Note: *All the evolutions of these components are described further on, in the related sections.*

OPERATING SYSTEMS

	Release tested with product avail.	Monopro. Cert.	Multipro. Cert.	Additional Multipro. Software	Notes
Windows 95		Yes	No		For single-user, single-task, graphical environments.
Windows NT Server and Service pack 4	3.51	Yes	Yes	O.S. included	For network management.
Windows NT Server	4.0	Yes	Yes	O.S. included	For network management.
NetWare 3.x	3.12	Yes	No		For network management.
NetWare 4.x	4.11 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 two CPUs included.	For multiple-user, multiple-task environments.
SCO Open Server	5.02	Yes	Yes	O.S. included	For multiple-user, multiple-task environments.
OS/2 R2.1 +Fix Pack98 +Lan Server 4.0	2.11 SMP	Yes	Yes		For single-user, multiple-task environments.
OS/2 + FixPack XR_W023	3.0 (Warp)	Yes	Yes		For single-user, multiple-task environments.

MONITORS

MODEL	DESCRIPTION	SUPPLIER	PDG NAME
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 61-104	104-key "WIN95" keyboard + cable.
ANK 61-105	105-key "WIN95" keyboard + cable.
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-6537D Sony MPF520-3 Mitsumi D359T5 Panasonic JU-257A 746P	MFD	SA450	1.44 MB	3.5"	Under BU
Wangtek 51000HT (std front panel) Tandberg TDC4120	STU	SCSI	1/1.2 GB	5.25" HH	STS 1G-95
Hewlett Packard HP C1536A Sony SDT-4000 (with mechanical adapter for 5.25" bays)	DAT	SCSI	2/8 GB	3.5"	DAT 4000DDS
Hewlett Packard HP C1533A Sony SDT-7000 (with mechancal adapter for 5.252 bays)	DAT	SCSI	4/16 GB	3.5"	DAT 8000DDS2
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 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" x 1.6"	HDR 9G72-UW

Note: - *The HDUs that are compatible with this system and with the PEM are hot swappable drives fixed on an appropriate support and equipped with an 80-pin SCA (Single Connector Attachment) interface connector that allows direct connection to the system and PEM backplane.*
- *In RAID configurations, always use HDUs with the same speed (all 5400 RPM or all 7200 RPM).*
- *The Ultra Wide HDUs available for this system only work in the Fast Wide mode since they are always connected to a Fast Wide controller.*
- *The 9.1 GB ST19171WC HDU can only be fitted in the rack BUs if the environmental temperature of the location where the BU is installed is ≤ 25 degrees Centigrade.*

ELECTRONIC BOARDS

BOARD NAME	DESCRIPTION	BUS	PDG NAME
BA2320	Motherboard with ten expansion slots, Lance SCSI Wide controller, Super VGA video controller, 1 MB video memory, 512 KB BIOS Flash EPROM, floppy disk controller, two serial ports, parallel port, keyboard and mouse management.	-	Under BU
UC2007	CPU board with a 200/66 MHz Pentium PRO 200-256 processor or 200/66 MHz Pentium PRO 200-512 processor inserted in a ZIF Socket 8 with dedicated VRM, second Socket 8 for the installation of a second optional Pentium PRO processor identical to the first and also equipped with a VRM connector, Natoma chipset, eight DIMM socket for a 32 MB to 1024 MB system memory. The PPRO 200-256 processor has a 256 KB integrated second level cache, the 200-512 PPRO has a 512 KB integrated second level cache.	-	Under BU
	Additional Pentium PRO 200-256 processor with an active heatsink and a VRM.	-	APU 200P6-P256
	Additional Pentium PRO 200-512 processor with an active heatsink and a VRM.		APU 200P6-P512
GO2172	Single-channel single-ended Ultra Wide SCSI controller based on the Adaptec 7880 chip. On this system, this controller is only used for the connection of internal HDUs in non-resilient configurations.	PCI	SCC PCI 114UW
GO2173 (PM3334UW) (RAID DPT)	Single-/tri-channel single-ended Ultra Wide SCSI controller with hard disk hot swapping RAID-0, 1, 5 features. The second and third channels are optional and are provided by means of a board plugged into the specific socket on the controller board. The controller is also equipped with four sockets for the installation of ECC cache; one socket with 4 MB is always filled.	PCI	Under BU or DCR PCI1/3UW
IF2065 (SX4030/1UW)	Piggy back board providing the second Ultra Wide SCSI channel (external only), on the GO2173, internal SCSI Wide cable for connection between the board and SCSI connector flush with the system frame.	-	EXP 2NDSCSIUW
IF2066 (SX4030/2UW)	Piggy back board providing the second and third Ultra Wide SCSI channels (external only), on the GO2173, two internal SCSI Wide cables for connection between the board and SCSI connectors flush with the system frame.	-	EXP 2&3SCSIUW
MEM 2027 (SM4000/4)	One 4 MB ECC SIMM for cache expansion on the GO2173 controller. 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 for the connection of the HDU to the SCSI controller and to the power supply.	-	Under BU and under PEM Wide
IF2031	Swap board for console LED interface.	-	Under BU and PEM
IF2022	Jumper Board joining the two SCSI buses of the backplane. Used in non-duplexing configurations.	-	Under BU and PEM
IF2024	Terminator board to separately terminate the two SCSI buses of the basic module backplane. For duplexing configurations only. The kit also contains the internal SCSI Wide cable for the connection of the backplane to the SCSI controller.	-	DUPKIT240W DUP KIT240RM/W
IF2015	Fan power supply distribution board.	-	Under BU

BOARD NAME	DESCRIPTION	BUS	PDG NAME
IF2035	Power supply parallelism board for Silver systems. In addition to the board, the redundancy kit also includes the second PS45 power supply, three fans with related support, motherboard-IF2035 connection cable, IF2035-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 Rack 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 DBOX for Stallion (max 4)	-	DBOX 800
BOX 1600	16-way RS232D DBOX for Stallion (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)	Fast Ethernet 10/100 LAN controller	PCI	3C905 TX

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

POWER SUPPLIES AND SPS

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

SERIAL AND PARALLEL CONNECTION CABLES

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

INTERRUPT LEVELS

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

SYSTEM MEMORY MAP

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

DMA CHANNELS

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

I/O ADDRESS MAP

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

POWER ON DIAGNOSTICS MESSAGES

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

SYSTEM CONFIGURATION UTILITY

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

ORCHESTRA SYSTEMA CD-ROM

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

CONFIGURATION OF OPTIONAL BOARDS

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

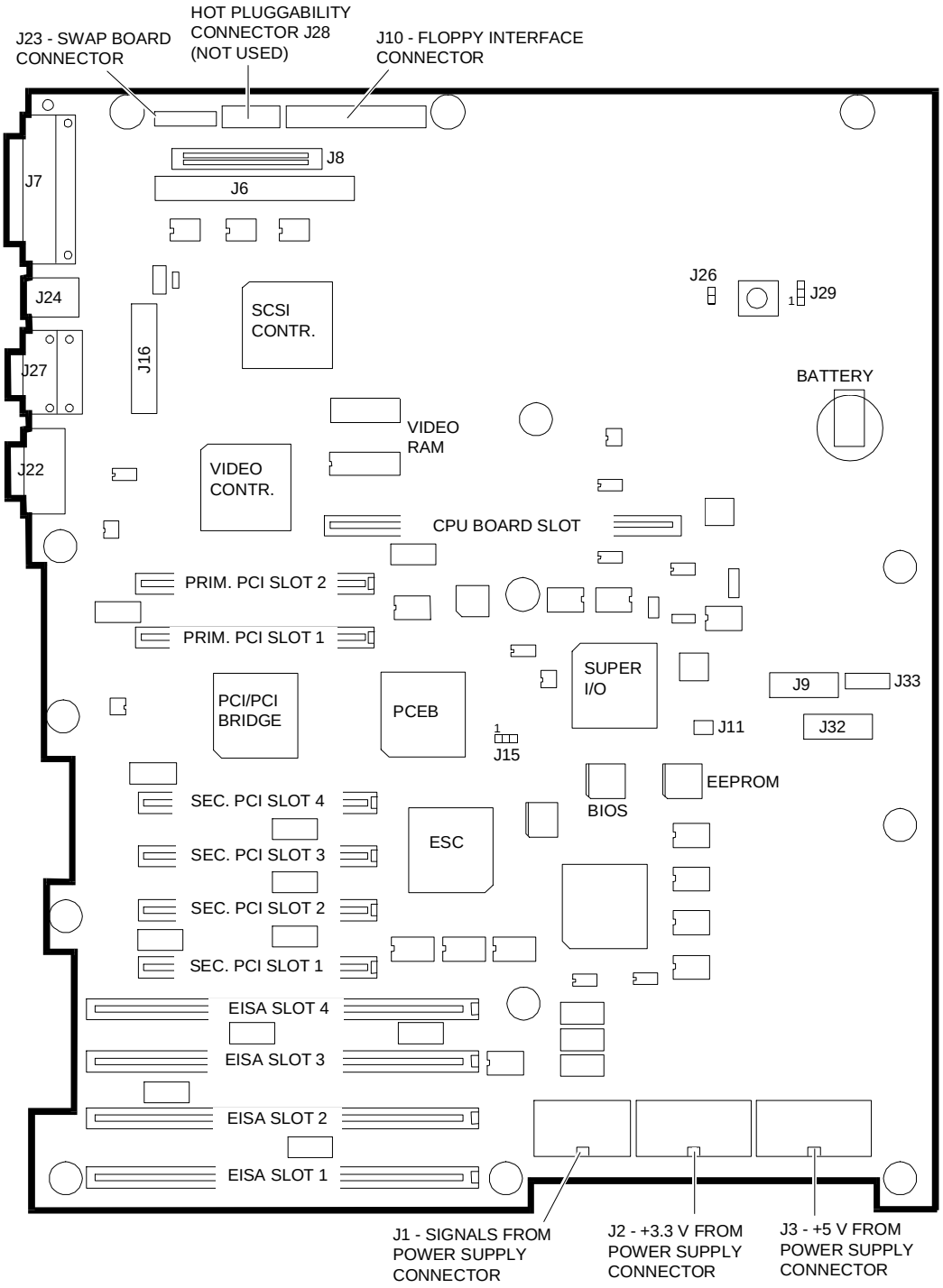
NOTES ON THE CONFIGURABILITY OF AT LINE BOARDS

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

REDUNDANCY

Refer to the related section in the chapter entitled SNX 160/RS/RM NEW Systema.

MOTHERBOARD BA2320



J7 Double connector:
High - LPT1 parallel port
Low - External SCSI Narrow

J24 Double connector:
High - keyboard, Low - mouse

J27 Double connector:
High - First COM1 serial port
Low - Second COM2 serial port

J22 VGA video interface connector

J8 Internal SCSI Wide connector

J6 Internal SCSI Narrow connector

J16 Feature Connector

J9 Remote Power Control connector for remote diagnostics (not used)

J32 Intel HOBBES remote diagnostics board interface connector (not used)

J33 Remote diagnostics connector (not used)

Note: *Board BA2320 is identical to the BA2298 used on the SNX 160/RS/RM NEW Systema. The only difference is the contents of the BIOS.*

JUMPERS

CONFIGURATION BY-PASS JUMPER	
J26	**DESCRIPTION**
ON	The system is set to the default configuration and any configuration stored in the configuration EEPROM is ignored along with all security features.
OFF *	Normal setting where at power on the system is set to the configuration stored in EEPROM.

BIOS FLASH EPROM WRITE ENABLE JUMPER	
J15	**DESCRIPTION**
PINs 1-2 ON *	Enables writes to the BIOS Flash EPROM. This is the normal setting where the memory write enable signal is under software control.
PINs 2-3 ON	Diasbles writes to the BIOS Flash EPROM. This is the protection position where Flash EPROM programming is blocked.

HOBBES SECURITY JUMPER	
J29	**DESCRIPTION**
OFF	Not used, no jumper installed. PINs 1-2 ON = Hardware Security, PINs 2-3 ON = Programmable Security

BATTERY POWER JUMPER	
J11	**DESCRIPTION**
ON	Used only at the factory to disconnect the battery from the In-Circuit-Test circuitry. Usually set to ON.

VIDEO CONTROLLER

The onboard video controller is a Trident SVGA TGUI9440-1 implemented on the primary PCI bus. A 1 MB video memory is available. The following table lists the supported resolutions.

Standard Video Mode

Mode	Resolution/Colors	Pixel Rate (MHz)	Horizontal Freq. (KHz)	Vertical Freq. (Hz)	Memory (KB)	Address
0H, 1H	320x200-16	28	31.4	70	256	B800
2H, 3H	640x200-16	28	31.4	70	256	B800
4H, 5H	320x200-4	25	31.4	70	256	B800
6H	640x200-2	25	31.4	70	256	B800
7H	720x350-mono	28	31.5	70	256	B000
DH	320x200-16	25	31.4	70	256	A000
EH	640x200-16	25	31.4	70	256	A000
10H	640x350-16	25	31.4	70	256	A000
11H	640x480-2	25	31.4	60	256	A000
12H	640x480-16	25	31.4	60	256	A000
13H	320x200-256	25	31.4	70	256	A000

Extended Video Mode

Mode	Resolution/Colors	Pixel Rate (MHz)	Horizontal Freq. (KHz)	Vertical Freq. (Hz)	Memory (KB)	Address
50H	640x480-16	25	31.5	60	256	B800
51H	640x473-16	25	31.5	60	256	B800
52H	640x480-16	25	31.5	60	256	B800
53H	1056x350-16	40	31.3	70	256	B800
54H	1056x480-16	40	31.3	60	256	B800
55H	1056x473-16	40	31.3	60	256	B800
56H	1056x480-16	40	31.3	60	256	B800
57H	1188x350-16	45	31.3	70	512	B800
58H	1188x480-16	45	31.3	60	512	B800
59H	1188x473-16	45	31.3	60	512	B800
5AH	1188x480-16	45	31.3	60	512	B800
5BH_1	800x600-16	36	35.2	56	256	A000
5BH_2	800x600-16	50	48.1	72	512	A000
5DH_1	640x480-256	25	31.6	60	512	A000
5DH_2	640x480-256	32	38.2	72	512	A000
5EH_1	800x600-256	36	35.5	56	512	A000
5EH_2	800x600-256	50	48.3	72	512	A000
5FH_1	1024x768-16	45	35.5	87i	512	A000
5FH_2	1024x768-16	65	48.5	60	512	A000
5FH_3	1024x768-16	75	56.5	70	512	A000
60H	1024x768-16	45	35.7	87i	512	A000
61H	1024x768-16	45	37.3	70i	512	A000
6AH_1	800x600-16	36	35.2	56	256	A000
6AH_2	800x600-16	50	48.1	72	512	A000
6BH	320x200-16M	40	36.1	70	512	A000
70H	512x480-32	40	31.4	60	512	A000
71H	512x480-64	40	31.4	60	512	A000
72H	640x400-32K	50	30.2	70	512	A000
73H	640x400-64K	50	30.2	70	512	A000
7EH	320x200-32K	25	31.4	70	512	A000
7FH	320x200-64K	25	31.4	70	512	A000
5CH	640x400-256	25	31.6	70	1	A000
62H_1	1024x768-256	45	35.5	87i	1	A000
62H_2	1024x768-256	65	48.5	60	1	A000
62H_3	1024x768-256	75	56.5	70	1	A000
62H_4	1024x768-256	80	59.5	75	1	A000
63H_1	1280x1024-16	75	46.9	87i	1	A000
63H_2	1280x1024-16	108	63.0	60	1	A000
65H_1	1600x1200-16	108	54.5	87i	1	A000
6CH	640x480-T	75	31.4	60	1	A000
74H_1	640x480-32K	50	31.4	60	1	A000
74H_2	640x480-32K	65	40.1	72	1	A000
75H_1	640x480-64K	50	31.4	60	1	A000
75H_2	640x480-64K	65	40.1	72	1	A000
76H	800x600-32K	72	35.2	56	1	A000
77H	800x600-64K	72	35.2	56	1	A000

SCSI CONTROLLER

Note: *The onboard SCSI controller is only used for connecting internal and external removable peripherals, PEM excluded.*
An additional Ultra Wide SCSI controller is used for the connection of HDUs and is present in every configuration.

The SCSI controller embedded on the motherboard is implemented on the PCI bus and provides a fast single-ended SCSI Wide (16-bit) channel based on the Adaptec AIC7870 (Lance) controller. This chips 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 in the case of Wide (16-bit) peripherals, not planned, or 10 MB/sec in the case of Narrow (8-bit) peripherals.

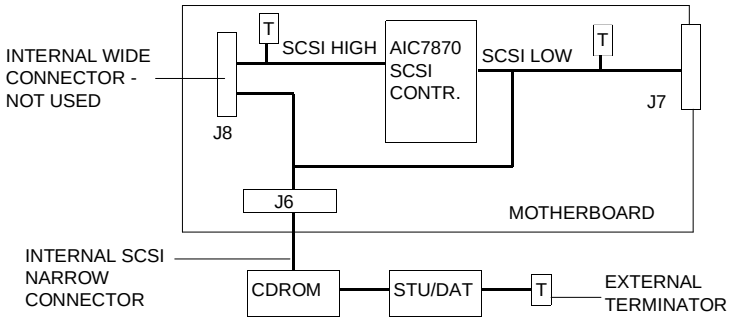
This board has the following connectors:

- Internal 68-pin high density Wide connector J8 which is not used.
- Internal 50-pin Narrow connector J6 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: those with an internal Narrow and external Narrow connector.
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 NetStrada 5000 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
CPU BOARD BUS			
CPU board (always installed)	1	CPU slot	J12
PRIMARY PCI BUS			
Full size PCI board	2	Slot 1	J21
		Slot 2	J25
SECONDARY PCI BUS			
Full size PCI board (PCI/EISA shared slot)	1	Slot 1	J17
Full size PCI board	3	Slot 2	J18
		Slot 3	J19
		Slot 4	J20
EISA BUS (All bus master slots)			
Full size EISA/ISA board	3	Slot 1	J4
		Slot 2	J5
		Slot 3	J13
Full size EISA /ISA board (PCI/EISA shared slot)	1	Slot 4	J14

Notes:

- *The PCI expansion boards can be installed in either the primary or secondary PCI slots, indifferently; there are no functional differences.*
- *Primary PCI slot (J17) and EISA slot 4 (J14) are considered as a single, shareable, slot since they are both physically close together. In this case only one board can be installed; PCI boards are installed in the PCI slot while EISA, ISA or P&P ISA boards are installed in the EISA slot.*
- *The PCI and EISA slots have no priorities.*
- *The DPT SCSI controllers must be installed in the following order; the first board in primary PCI slot 1, the second board in primary PCI slot 2 while the third board in secondary PCI slot 4.*

BOARD BA2320 (P.c.b code 654519 H) EVOLUTION

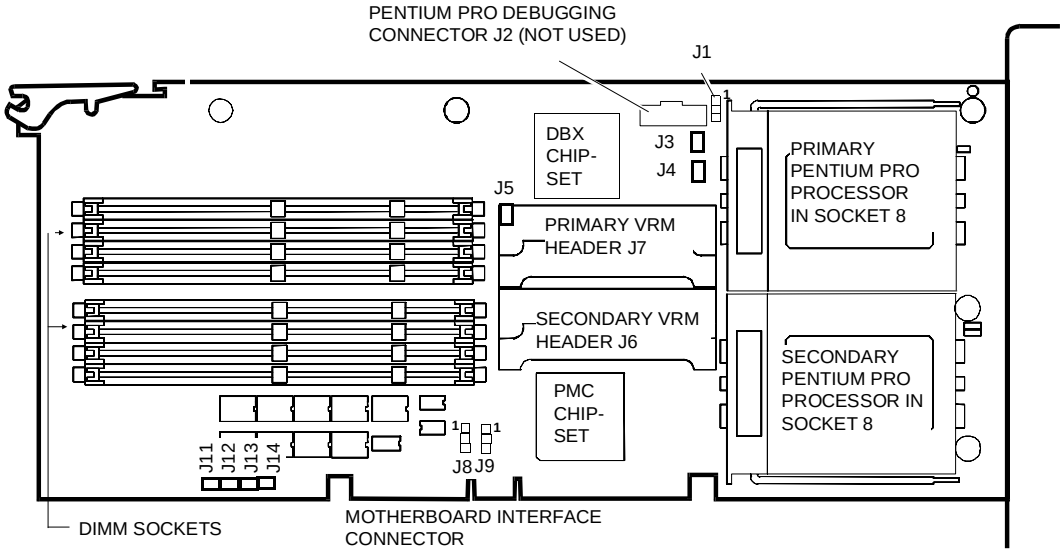
DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
12/96	Nasc	212812 L	New board. The first BIOS release is 1.04 code 212814 N lev. Nasc. The BIOS evolutions are described further on.	Factory
1/97	01		Missing Adaptec AIC-7870 component. Replace the AIC7870 component in pos. U26 with the AIC7880 component, mount a 0 Ohm resistor in pos. R57. Board functions do not change.	Factory
2/97	02		Improvements to the performance of the Trident video controller: do not mount the 4.7 KOhm resistor in pos. R232.	Factory

BIOS EVOLUTION FOR THE BA2320

DATE	LEV.	BIOS	CODE	REASON FOR CHANGE
12/96	Nasc	1.04	212814 N	New BIOS.
2/97	01	1.05		New BIOS release: - Corrected the timing of EDO RAM (not used) - Handling of the Pentium PRO step B1 CPU - Handling of the year 2000 Configurator release 1.05 must be used for this BIOS.

Note: *Since February 1997 Intel is no longer producing the PPRO step B0 processors and therefore the PPRO 200/512 step B1 processors code 4893196M will be used in replacement of the step B0 processor once out of stock. The systems with the step B1 processor must contain a BIOS release* $\geq$ *1.05 that correctly recognized this new step.*

DUALPROCESSOR UC2007 CPU BOARD



MICROPROCESSOR

One or two microprocessors can be installed on this board. The basic configuration comes with only one processor installed, with the possibility of installing an optional second processor. This board can host a 200/66 MHz Pentium PRO 200-256 or a 200/66 MHz Pentium PRO 200-512 processor as either the primary or secondary CPU; the primary processor is always present while the second processor, which must be identical to the first, is optional. Both processors are installed in the two ZIF Socket 8s and act as either the primary or secondary processor depending on the socket in which they are installed. In fact, during system boot the main processor acknowledges the presence of a processor installed in the second socket and automatically sets the handshake protocol. The processors are equipped with an 16 KB internal primary cache and a 256 KB secondary cache for the PPRO 200-256 or 512 KB for the PPRO 200-512. The primary processor can be optionally replaced by future Intel OverDrive processors.

Note: *The PPRO 200-256 and PPRO 200-512 processors cannot coexist on the same system. The primary PPRO 200-256 processor can be replaced by the PPRO 200-512.*

For each of the two processors the board is equipped with a 30-pin VRM header connector for the installation of a separate VRM (Voltage Regulator Module). VRM Header connector J7 is reserved for the primary processor while VRM Header connector J6 is reserved for the secondary processor.
The VRM is a DC/DC converter that provides power to the CPU. By means of four signals, it is the processor itself that informs the VRM of the voltage required:

VID3	VID2	VID1	VID0	VOLTAGE PROVIDED BY THE VRM
1	0	1	1	2.4 V
1	0	1	0	2.5 V
1	0	0	1	2.6 V
1	0	0	0	2.7 V
0	1	1	1	2.8 V
0	1	1	0	2.9 V
0	1	0	1	3.0 V
0	1	0	0	3.1 V
0	0	1	1	3.2 V
0	0	1	0	3.3 V
0	0	0	1	3.4 V

All the Pentium PRO processors installed on this system must have the specific VRM AL2023 (vimo code 210813X, p.c.b. code 654535 Z) inserted in the related VRM header connector.

The two 3-pin jumpers J8 and J9 are used for the selection of the host bus and PCI bus clocks:

JUMPERS		HOST BUS FREQ.	PCI BUS FREQ.	NOTES
J8	J9			
1-2	2-3	66 MHz	33 MHz	Setting to be used
2-3	1-2	60 MHz	30 MHz	Not used

3-pin jumper J1 determines the number of processors present on the board and must therefore be set accordingly when a second processor is installed:

JUMPER J1	NUMBER OF PROCESSORS
1-2	1 (monoprocessor) - default
2-3	2 (dualprocessor)

The board also gives the possibility of selecting the processor bus and core clock frequency ratio. Selection is made using the four 2-pin jumpers J11, J12, J13 and J14.

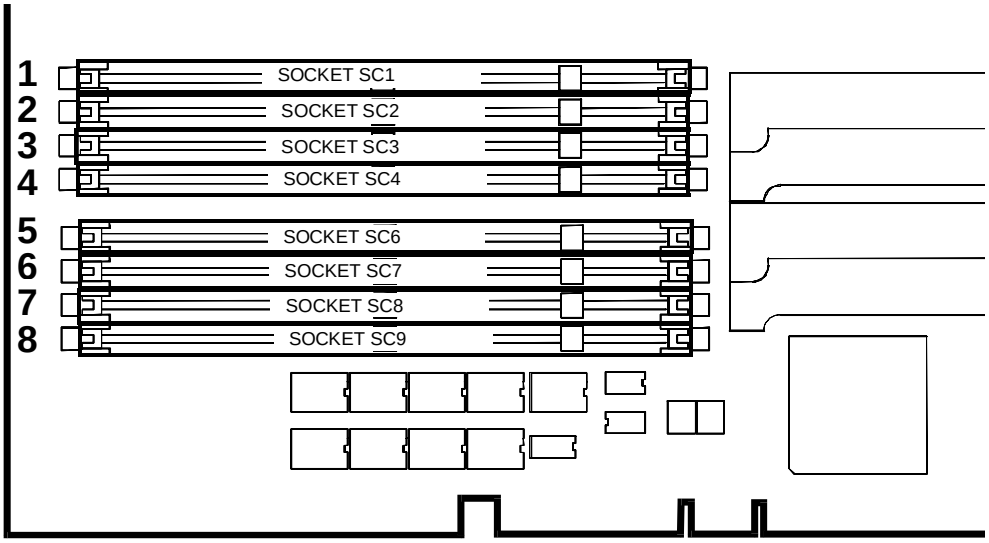
JUMPERS				BUS FREQ.	MULT.	PROCESSOR FREQUENCY	NOTES
J14	J13	J12	J11				
ON	ON	ON	ON	60 MHz	2 x	120 MHz	Not used
ON	ON	ON	OFF	60 MHz	2.5 x	150 MHz	Not used
ON	ON	OFF	ON	60 MHz	3 x	180 MHz	Not used
ON	ON	OFF	OFF	60 MHz	3.5 x	210 MHz	Not used
ON	OFF	ON	ON	60 MHz	4 x	240 MHz	Not used
ON	OFF	ON	OFF	60 MHz	4.5 x	270 MHz	Not used
ON	OFF	OFF	ON	60 MHz	5 x	300 MHz	Not used
ON	OFF	OFF	OFF	60 MHz	5.5 x	330 MHz	Not used
ON	ON	ON	ON	66.6 MHz	2 x	133 MHz	Not used
ON	ON	ON	OFF	66.6 MHz	2.5 x	166 MHz	Not used
ON	ON	OFF	ON	66.6 MHz	3 x	200 MHz	NetStrada 5000
ON	ON	OFF	OFF	66.6 MHz	3.5 x	233 MHz	Not used
ON	OFF	ON	ON	66.6 MHz	4 x	266 MHz	Not used
ON	OFF	ON	OFF	66.6 MHz	4.5 x	300 MHz	Not used
ON	OFF	OFF	ON	66.6 MHz	5 x	333 MHz	Not used
ON	OFF	OFF	OFF	66.6 MHz	5.5 x	366 MHz	Not used

Note: *It is important to set these jumpers according to the type of processor installed. In case the wrong frequency is selected, the processor speed may differ from the one specified (for example, a 200 MHz Pentium Pro whose jumpers are set for a 166 MHz clock will work with a clock reduced to 166 MHz while if the jumpers are set for a higher clock the board will not work). The jumpers are set at the factory and their setting must not be changed.*

A passive heatsink mounted on the processor chip is sufficient enough to cool down the primary Pentium PRO while the secondary processor requires an active heatsink. Therefore of the two J3 and J4 connectors reserved for the connection of the fans of the active heatsinks, only one is used for the secondary processor while the other is not used.

MEMORY EXPANSION DIMMS

The CPU board has eight 168-pin sockets for the installation of 3.3 V DIMMs. The memory controller in the chipset supports fast page mode parity checking or ECC DIMMs, or no parity EDO or ECC DIMMs. The memory controller on these systems is programmed to support fast page mode DIMMs with ECC checking. When DIMMs are either installed or removed, simply power on the system again and run the ECU; there are no hardware jumper settings to be made.



The memory configuration rules are listed below:

- The system sees its memory as being divided into eight banks (1, 2, 3, 4, 5, 6, 7 and 8). Each bank consists of one socket on the CPU board. Bank 1, socket SC1; Bank 2, socket SC2; Bank 3, socket SC3; Bank 4, socket SC4; Bank 5, socket SC6; Bank 6, socket SC7; Bank 7, socket SC8; Bank 8, socket SC9. The DIMMs can also be installed individually.
- DIMMs of different capacities can be installed on the same board.
- The minimum memory capacity is 32 MB expandible to 1 GB.
- Always install the DIMMs starting from bank 1 and in the following order: SC1, SC2, SC3, SC4, SC6, SC7, SC8 and then SC9.

The following ECC DIMMs are to be used:

PDG NAME	SIZE	MEMORY EXPANSION KIT
EXM 3V008	8 MB	One 1 Mbit x 72 bit, 60 ns, 3.3 V DIMM.
EXM 3V016	16 MB	One 2 Mbit x 72 bit, 60 ns, 3.3 V DIMM.
EXM 3V032	32 MB	One 4 Mbit x 72 bit, 60 ns, 3.3 V DIMM.
EXM 3V032S	32 MB	One 4 Mbit x 72 bit, 60 ns, 3.3 V DIMM.
EXM 3V064	64 MB	One 8 Mbit x 72 bit, 60 ns, 3.3 V DIMM.
EXM 3V128	128 MB	One 16 Mbit x 72 bit, 60 ns, 3.3 V DIMM.

The following table gives some of the possible memory configuration combinations.

TOTAL MEMORY	BANK 1	BANK 2	BANK 3	BANK 4	BANK 5	BANK 6	BANK 7	BANK 8
	SOCKET SC1	SOCKET SC2	SOCKET SC3	SOCKET SC4	SOCKET SC6	SOCKET SC7	SOCKET SC8	SOCKET SC9
32 MB	8 MB	8 MB	8 MB	8 MB				
40 MB	8 MB	8 MB	8 MB	8 MB	8 MB			
48 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB		
56 MB	8 MB	8 MB	8 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
48 MB	8 MB	8 MB	16 MB	16 MB				
96 MB	8 MB	8 MB	8 MB	8 MB	16 MB	16 MB	16 MB	16 MB
40 MB	8 MB	32 MB						
80 MB	8 MB	8 MB	32 MB	32 MB				
160 MB	8 MB	8 MB	8 MB	8 MB	32 MB	32 MB	32 MB	32 MB
72 MB	8 MB	64 MB						
144 MB	8 MB	8 MB	64 MB	64 MB				
288 MB	8 MB	8 MB	8 MB	8 MB	64 MB	64 MB	64 MB	64 MB
136 MB	8 MB	128 MB						
272 MB	8 MB	8 MB	128 MB	128 MB				
544 MB	8 MB	8 MB	8 MB	8 MB	128 MB	128 MB	128 MB	128 MB
32 MB	16 MB	16 MB						
48 MB	16 MB	16 MB	16 MB					
64 MB	16 MB	16 MB	16 MB	16 MB				
80 MB	16 MB	16 MB	16 MB	16 MB	16 MB			
96 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB		
112 MB	16 MB	16 MB	16 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
48 MB	16 MB	32 MB						
96 MB	16 MB	16 MB	32 MB	32 MB				
192 MB	16 MB	16 MB	16 MB	16 MB	32 MB	32 MB	32 MB	32 MB
80 MB	16 MB	64 MB						
160 MB	16 MB	16 MB	64 MB	64 MB				
320 MB	16 MB	16 MB	16 MB	16 MB	64 MB	64 MB	64 MB	64 MB
144 MB	16 MB	128 MB						
288 MB	16 MB	16 MB	128 MB	128 MB				
576 MB	16 MB	16 MB	16 MB	16 MB	128 MB	128 MB	128 MB	128 MB
32 MB	32 MB							
64 MB	32 MB	32 MB						
96 MB	32 MB	32 MB	32 MB					
128 MB	32 MB	32 MB	32 MB	32 MB				
160 MB	32 MB	32 MB	32 MB	32 MB	32 MB			
192 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB		
224 MB	32 MB	32 MB	32 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
96 MB	32 MB	64 MB						
192 MB	32 MB	32 MB	64 MB	64 MB				

TOTAL MEMORY	BANK 1	BANK 2	BANK 3	BANK 4	BANK 5	BANK 6	BANK 7	BANK 8
	SOCKET SC1	SOCKET SC2	SOCKET SC3	SOCKET SC4	SOCKET SC6	SOCKET SC7	SOCKET SC8	SOCKET SC9
384 MB	32 MB	32 MB	32 MB	32 MB	64 MB	64 MB	64 MB	64 MB
160 MB	32 MB	128 MB						
320 MB	32 MB	32 MB	128 MB	128 MB				
640 MB	32 MB	32 MB	32 MB	32 MB	128 MB	128 MB	128 MB	128 MB
64 MB	64 MB							
128 MB	64 MB	64 MB						
192 MB	64 MB	64 MB	64 MB					
256 MB	64 MB	64 MB	64 MB	64 MB				
320 MB	64 MB	64 MB	64 MB	64 MB	64 MB			
384 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB		
448 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	
512 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB
192 MB	64 MB	128 MB						
384 MB	64 MB	64 MB	128 MB	128 MB				
768 MB	64 MB	64 MB	64 MB	64 MB	128 MB	128 MB	128 MB	128 MB
128 MB	128 MB							
256 MB	128 MB	128 MB						
384 MB	128 MB	128 MB	128 MB					
512 MB	128 MB	128 MB	128 MB	128 MB				
640 MB	128 MB	128 MB	128 MB	128 MB	128 MB			
768 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB		
896 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	
1024 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB

BOARD UC2007 (P.c.b. code 654501 G) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
11/96	Nasc	210932 W	New CPU board with a 200 MHz Pentium PRO processor	Factory
11/96	01		The system crashes during the POD due to an unclear Intel errata on the Natima chipset. Insert a pull-up resistor on the signal (connect pin 1 of R78 with pin 193 or U1 - signal PC0). All the machines are manufactured with this modification.	Factory

NOTES AND LIMITATIONS

CONFIGURATION

- If the user decides not to use some of the HDUs present in the system and removes them from the rack, they must be completely removed to avoid the HDU slides from causing the loss of the hot swapping feature.
- On systems connected to PEMs and with disks connected to different channels of the same controller (RAID DPT), the system and PEM must be powered on or off only from the UPS. The system and PEM power switches must be locked in the ON position.
- There is no 128 KB gap between 512 and 640 KB in mega 0. This prevents the mapping of DPM boards in that area.
- Up to three GO2173 RAID DPT boards can be installed in the system; they are located in the motherboard slots as follows: the first board in the primary PCI slot 1, the second board in the primary PCI slot 2 and the third board in the secondary PCI slot 4.
- If additional video boards are to be installed in the place of the controller on the motherboard, these boards must be installed in the slots of the primary PCI bus.
- For a correct system setup, activate System Configuration from Orchestra and select the following options in this order: Configure System, Standard Configuration, Select Step 3: View or Edit Details.
  Using the cursor movement keys, go to "Primary Operating System" and select:
  - "Unix, Novell, Windows NT, OS/2, Other (Multi-Processor)" for all operating systems, single or multiprocessor, with the exception of single-processor UNIX operating systems.
  - "Unix, Novell, Windows NT, OS/2, Other (Single-Processor) for single-processor UNIX operating systems.
  - Press the F10 key to save the configuration, then reboot the system.
- If the system is equipped with an RAID DPT Ultra Wide SCSI controller installed in a secondary PCI slot, run the Configuration Utility to check that the controller I/O port address is set at FC00H.
  When the system is rebooted and other boards are installed in the PCI bus slots, ignore if an I/O port address other than FC00H is displayed for the DPT controller during the POD.
- To activate the LAN test with the 3C905 and OC3137 controllers, due to problems with the current driver releases it is necessary that the boards be only installed on the primary PCI bus.
- When using network cards installed in PCI slots, run the Configuration Utility to check that the I/O addresses of the boards are not at ISA addresses or aliases (for example, 500H, 600H, 700H).
- Kit APU 200P6-P512 containing the Pentium PRO 200-512 processor can be used as an upgrade processor on systems equipped with the PPRO 200-256 (with a 256 KB cache) and as an additional processor on systems equipped with the PPRO 200-512 (with a 512 KB cache).

- Since there are more PCI devices and slots than PCI interrupts, the onboard SCSI controller must share the interrupt with an expansion PCI slot.
  The following table shows the connection of the PCI interrupt lines.

PCI INTERRUPT LEVELS	DESCRIPTION	CONNECTED TO THESE PCI SLOTS
INTA#	PCI interrupt level A to the PCEB. **Also used by the onboard SCSI controller.**	**To slot 5 as INTA#** To slots 8 and 10 as INTB# To slots 7 and 9 as INTC# To slot 6 as INTD#
INTB#	PCI interrupt level B to the PCEB. This line is also present on the onboard video controller but is not used	**To slot 6 as INTA#** To slot 5 as INTB# To slots 8 and 10 as INTC# To slots 7 and 9 as INTD#
INTC#	PCI interrupt level C to the PCEB.	**To slots 7 and 9 as INTA#** To slot 6 as INTB# To slot 5 as INTC# To slots 8 and 10 as INTD#
INTD#	PCI interrupt level D to the PCEB.	**To slots 8 and 10 as INTA#** To slots 7 and 9 as INTB# To slot 6 as INTC# To slot 5 as INTD#

Example 1: a PCI board that interrupts on INTA# and which is plugged into slot 5, is interpreted by the system as INTA# which is already used by the onboard SCSI controller. INTA# can only be shared with another SCSI controller that uses similar drivers and not with a network board (this only applies if the O.S. is not PCI 2.1 compliant, otherwise there are no restrictions).

Example 2: a PCI board that interrupts on INTB# and which is plugged into slot 8 or 10, is interpreted by the system as INTA# which is already used by the onboard SCSI controller. INTA# can only be shared with another SCSI controller that uses similar drivers and not with a network board (this only applies if the O.S. is not PCI 2.1 compliant, otherwise there are no restrictions).

Example 3: a PCI board that interrupts on INTA# and which is plugged into slot 6, is interpreted by the system as INTB# which is available.

Example 4: a PCI board that interrupts on INTA# and which is plugged into slot 8 or 10, is interpreted by the system as INTD# which is available.

The following table shows the correspondence between the logical PCI slots and the physical ones shown on the motherboard layout.

Logical PCI Slot	Physical PCI Slot	Logical PCI Slot	Physical PCI Slot
Slot 5	Secondary PCI slot 1	Slot 8	Secondary PCI slot 4
Slot 6	Secondary PCI slot 2	Slot 9	Primary PCI slot 1
Slot 7	Secondary PCI slot 3	Slot 10	Primary PCI slot 2

OPERATING SYSTEMS

- The SCO 3.2.4.2 operating system is not supported on these systems.
- When SCSI controllers of the same kind are installed (for example onboard Lance the GO2172), in order to be able to install the SCO 3.2.4.2 and SCO Open Server 5.xx operating systems the removable peripheral used for the installation (CD-ROM or STU) must be connected to the same channel as the bootable HDU, the STU must be assigned a SCSI ID=2 and the CD-ROM a SCSI ID=5, causing the loss of the related HDU bays. If the removables and the HDUs are connected to different kinds of SCSI controllers (for example the removables to a Lance and the HDUs to a RAID DPT), the only requirement is that the STU be assigned an ID=2 and the CD-ROM an ID=5. On a NetStrada 5000 system in a non-resilience configuration (without RAID controller), the removable peripherals must be connected to the onboard Lance controller and the HDUs to the GO2172 controller. Proceed as follows to install these operating systems:
  - Disconnect the HDU SCSI cable from the GO2172 controller and connect it to the onboard Lance controller; the terminators on the Lance controller are automatically disabled.
  - Make sure the STU has a SCSI ID=2 and the CD-ROM a SCSI ID=5.
  - From the rack, remove the hard disks with the same SCSI IDs as the removables installed in the system.
  - Install the operating system.
  - Reattach the HDU SCSI cable to the GO2172 controller and reinsert the HDUs that were previously removed from the rack.
  - Configure the system with SCO.
- Proceed as follows before installing the UnixWare 2.1 operating system and when a RAID DPT Ultra Wide SCSI controller is installed:
  - Boot the system using the Orchestra configurator.
  - Set the controller’s "ROM BIOS ADDRESS" to D0000H.
  - Exit from the configuration procedure using the "Save" option.
  - Reboot the system.
  - During the POD, make sure that the onboard Adaptec AIC7870 SCSI controller is set at address C800H and the DPT controller at address D000H.
  - Install the operating system
- With the Windows NT 3.51 and 4.0 operating systems, the system crashes during reboot after the installation of the Adaptec driver if the Wangtek STU is present. The system works correctly if the Tandberg STU is used.
- To install the ZX312 driver from Orchestra on a NT4.0 system, first copy the drive to the HDU and then proceed with its installation.

■