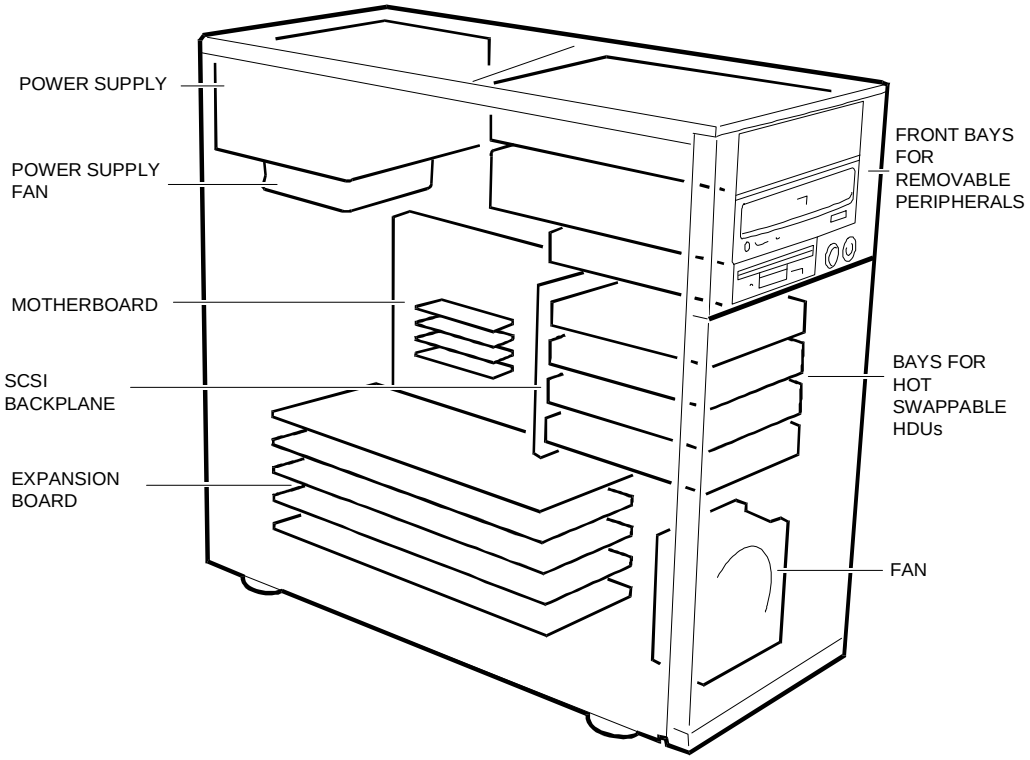
NetStrada 3000 (VULCAN)

CHARACTERISTICS

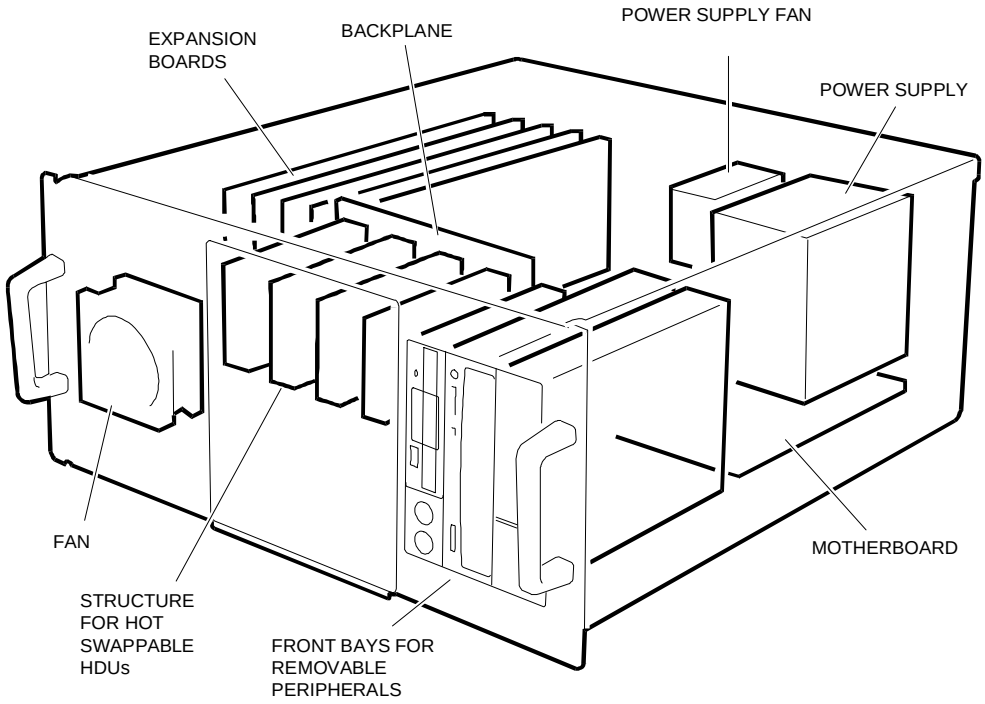
Microprocessor	200/66 MHz Intel PENTIUM PRO installed in Socket 8
Chipset	Intel 440FX (Natoma)
Dual-bus architecture	- 32-bit primary PCI (Peripheral Component Interconnect), 132 MB/sec - 16-bit ISA (Industry Standard Architecture), 8 MB/sec
Expansion slots	3 PCI, 2 ISA
Cache	256 KB or 512 KB of second level cache integrated in each PPRO
ECC RAM	32 MB to 512 MB (using 3.3 V DIMMs)
Cabinet	COPPER box
Versions available	Standard and 19" Rack version systems are available. The COPPER cabinet is the same, a RACK KIT-3000 kit is available to convert a standard system into a rack version. With respect to the standard systems, the 19" Rack systems can be hosted in a Rack cabinet which contains other units such as a monitor, keyboard, UPS and PEM
Video controller	Integrated on the onboard PCI bus, 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 Ultra Wide SCSI controller for the HDUs and the onboard Ultra Wide controller for the removables. The particular structure of the COPPER cabinet, 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 onboard Ultra Wide SCSI controller for the HDUs and the internal SCSI removables. HDU hot swapping is not supported.
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 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 Standard systems derives from the SILVER Wide box, the PEM for Rack systems is available in Rack Wide version and can host up to 12 HDUs. 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 two PEMs can be connected to the system.
SIREN (Simple Recovery Node)	Possibility of SIREN configurations with the RAID DPT Ultra Wide SCSI controller used for the management of the HDUs in the PEM. In this configuration there are only two basic modules connected to a Wide PEM; in case 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 commercial name of the NetStrada 3000 remains unchanged for the Standard and Rack box versions. For simplicity and whenever necessary, this guide will distinguish between these versions as follows:*
- NetStrada 3000 Standard
- NetStrada 3000 Rack

NETSTRADA 3000 STANDARD BASIC MODULE



NETSTRADA 3000 RACK BASIC MODULE



UPDATE LEVELS OF THE MAIN COMPONENTS ON THE FIRST SERIES NETSTRADA 3000 MODELS (FIRST STEP)

MOTHERBOARD	**BIOS**	**POWER SUPPLY**
BA2315 lev. Nasc	Rel. 1.00.01.DM0	
RAID DPT SCSI CONTR.	**ORCHESTRA rel. 2.0**	**SYSTEM TEST**
Not supported	Conf. 1.0, Diagn. 1.0	Rel. 1.0

UPDATE LEVELS OF THE MAIN COMPONENTS ON THE FIRST SERIES NETSTRADA 3000 MODELS (SECOND STEP)

MOTHERBOARD	**BIOS**	**POWER SUPPLY**
BA2315 lev. Nasc	Rel. 1.00.02.DM0	
RAID DPT SCSI CONTR.	**ORCHESTRA rel. 2.1**	**SYSTEM TEST**
GO2173 lev. Nasc FW 7H0	Conf. 1.0, Diagn. 1.0 up2	Rel. 1.0

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

OPERATING SYSTEMS

	Test Release with Product Availability	Notes
Windows 95		For single-user, single-task, graphical environments.
Windows NT Server and Service pack 4	3.51	For network management.
Windows NT Server	4.0	For network management.
NetWare 3.x with the following patch: 312.pt7	3.12	For network management.
NetWare 4.x with the following patches: 410.pt3, 410.it6, landr4.exe	4.1	For network management.
UnixWare	2.1	For multiple-user, multiple-task environments.
SCO Open Server	5.02	For multiple-user, multiple-task environments.
OS/2 2.x	2.11	For single-user, multiple-task environments.
OS/2 3.x	3.0 (Warp)	For single-user, multiple-task environments.

Note: *The NetStrada 3000 first step comes with the following operating systems:*
- NT3.51/4.0
- Novell NetWare 3.12/4.1
- OS/2 Warp 3.0
The other operating systems are available with the second step.

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 5.25" 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 (only in the PEM)

Notes: *- 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.*
- 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 HDUs in the PEM must only work in the Wide mode.
- Do not use HDUs with different RPMs in the same RAID configuration.

ELECTRONIC BOARDS

BOARD NAME	DESCRIPTION	BUS	PDG NAME
BA2315	Motherboard with a 200/66 MHz Pentium PRO 200-256 processor or a 200/66 MHz Pentium PRO 200-512 processor installed in a ZIF Socket 8 with a dedicated VRM, five expansion slots, four DIMM sockets for a system memory ranging from 32 MB to 512 MB, R440FX chipset, AIC 7880 Ultra Wide SCSI controller, SVGA video controller, 1 MB of video memory, Ethernet LAN controller, 512 KB BIOS Flash EPROM, 8 KB EEPROM storing the system configuration parameters, floppy disk controller, two serial ports, parallel port, keyboard and mouse management. The PPRO 200-256 processor has a 256 KB integrated second level cache while the PPRO 200-512 has a 512 KB integrated second level cache.	-	Under BU
	Pentium PRO 200-512 processor with an active heatsink and a VRM. On the NetStrada 3000 the kit is used to upgrade the systems equipped with a PPRO 200-256 processor. The active heatsink provided in the kit is not used since the passive heatsink on the PPRO 200-256 must be used.	-	APU 200P6-P512
GO2180 (AHA2940UW)	Single-channel single-ended Ultra Wide SCSI controller based on the Adaptec AIC 7880 chip. On this system, this controller is only used for duplexing configurations or for the connection of external removable SCSI peripherals, PEM excluded.	PCI	SCC PCI 3000UW
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
IF2063	SCSI channel distribution board, always present, to be plugged into the onboard SCSI Wide connector for the connection of the HDU and the SCSI removables.	-	Under BU
IF2060	SCSI Wide backplane for the connection of the HDU to the SCSI controller and to the power supply.	-	Under BU
IF2061	Swap Board for the console LED interface.	-	Under BU
IF2054	Jumper board joining the two SCSI buses of the IF2060 backplane. Used in non-duplexing configurations.	-	Under BU
IF2053	Terminator board to separately terminate the two SCSI buses of the basic module IF2060 backplane. For duplexing configurations only. The kit also contains the internal SCSI Wide cable for the connection of the backplane to the SCSI controller.	-	DUP KIT3000UW

BOARD NAME	DESCRIPTION	BUS	PDG NAME
GO2175 (Stallion)	32-channel RS232D multiport board. The kit also contains the cable for connection to the DBOX	ISA	C-MUX8-32I
BOX 800	8-way RS232D distribution box for Stallion (max 4)	-	DBOX 800
BOX 1600	16-way RS232D distribution box 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	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

POWER SUPPLY	OUTPUT VOLT.	TOLERANCE	MAX CURR	TOT. POW.	INPUT VOLTAGE	FREQ.	CABINET
ASTEC ATX 200-3505	+3.3 V +5 V +12 V -12 V -5 V +5 AUX	+3% -3% +5% -5% +5% -5% +10% -10% +10% -10% +10% -10%	12 A 20 A 6 A 0.8 A 0.5 A 0.1 A	200 W	100-120 Vac 200-240 Vac	50/60 Hz	Base

Note: *The power supply is not equipped with a monitor power out connector and therefore, for the requiring monitors, use adapter power cord CBL 2307 for connecting the monitor to the electrical outlet.*

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 NetStrada 3000 Rack.

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. In addition, 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.

FANS

This system is equipped with two fans: one is located on the power supply while the other is located at the front of the system, underneath the hard disk drives. The power supply fan rotates at a constant speed and is directly powered by the power supply.

The front fan used on the first series systems is model NMB 3610 KL-04W-B19, 1750 rpm, equipped with two wires, code 211931 J. This fan is always in operation, it turns at a constant speed and is powered by 12 V directly from the motherboard. If the fan fails a temperature sensor on the motherboard will detect this condition and appropriately inform the user who will power off the system if necessary.

The systems manufactured from 12/96 onwards use tachymetric fan NMB 3610 KL-04W-B29, 2000 rpm, equipped with three wires (+12 V, GND, tachymetric indication on the speed of the fans), code 214450 F. When the fan turns, a signal in the third wire of the fan toggles between 0 and 1; the fan stops the signal is at 0 or 1 indifferently. Server View is warned when the speed goes below the minimum threshold.

Note: *With the new fan, the DMI register "System Product Version" value must be set to 02 (see Appendix M).*

SERIAL AND PARLLEL 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

LEVEL	FUNCTION
INTR	Processor interrupt
NMI	Fatal errors; system failure or double error in RAM
IRQ0	Timer interrupt
IRQ1	Keyboard controller from 87308VUL
IRQ2	Not used, cascade connection to IRQ9
IRQ3	COM1 or COM2 on the motherboard from 87308VUL, configurable
IRQ4	COM1 or COM2 on the motherboard from 87308VUL, configurable
IRQ5	Free
IRQ6	Onboard floppy disk controller
IRQ7	Onboard LPT1 parallel port
IRQ8	Real time clock
IRQ9	Free
IRQ10	Assigned by the BIOS to the onboard Ethernet controller (can be reassigned)
IRQ11	Assigned by the BIOS to the onboard SCSI controller (can be reassigned)
IRQ12	Onboard mouse from 87308VUL
IRQ13	Math coprocessor
IRQ14	Free
IRQ15	Reserved

SYSTEM MEMOPRY MAP

ADDRESS RANGE	SIZE	FUNCTION
00000H to 07FFFH	512 KB	Base memory
80000H to 9FFFFH	128 KB	Base memory or used by PCI boards
0A0000H to 0BFFFFH	128 KB	Video RAM
0C0000H to 0C7FFFH	32 KB	RAM shadow reserved for the video BIOS
0C8000H to 0CFFFFH	32 KB	RAM shadow reserved for the SCSI BIOS
0D0000H to 0EFFFFH	128 KB	User memory area
0F0000H to FFFFFH	64 KB	System BIOS
100000H to 16 MB	15 MB	Extended ISA memory
15 MB to 16 MB	1 MB	Optional memory gap
16 MB to 1 GB		System memory

DMA CHANNELS

CHANNEL	FUNCTION	CHANNEL	FUNCTION
0	Free	4	Reserved
1	Free or EPP/ECP on the motherboard	5	Free
2	Reserved for the onboard floppy disk controller	6	Free
3	Free or EPP/ECP on the motherboard	7	Free

I/O ADDRESS MAP

I/O ADDRESS	DEVICE	CHIP
000 - 00F	Slave DMA controller 1	PIIX3
010 - 01F	Not used	
020 - 021	Master interrupt controller 1	PIIX3
022 - 02D	Reserved for the interrupt controller	
02E - 02F	Super I/O index and data registers	
030 - 03F	Reserved for the interrupt controller	
040 - 043	Programmable Timer 1	PIIX3
044 - 05F	Reserved for the programmable timer	
060 - 064	Keyboard/mouse controller	Chip sel. from 87308
61	NMI status and control register	PIIX3
062 - 063	In the AT standard, reserved for the 8255	
065 - 06F	In the AT standard, reserved for the 8255	
070	NMI Mask (bit7) and RTC Address (bit 6:0)	Write only
071	Real time clock (RTC)	Chip sel. from 87308
072 - 07F	Not used	
080 - 081	BIOS Timer	PIIX3
081-08F	DMA low page register	PIIX3
090 - 091	Reserved for DMA	
092	System control port A (PC-AT control-Port)	
093	Reserved for DMA	
094	Video controller	
095 - 09F	Reserved for DMA	
0A0 - 0BF	Slave interrupt controller 2	PIIX3
0C0 - 0DF	Master DMA controller 2	PIIX3
0E0 - 0EF	Not used	
0F0	Clears the NPX error	Resets IRQ13
0F1 - 0F7	Coprocessor registers	
0F8 - 0FF	x87 math coprocessor	
100 - 16F	Not used	
170 - 177	Not used	
180 - 1EF	Not used	
1F0 - 1F7	Not used	
1F8 - 1FF	Not used	
200 - 207	I/O game port	
220 - 22F	Serial port 1 (COM1)	
238 - 23F	Serial port 2 (COM2)	
278 - 27F	Parallel port 3 (LPT3)	
2E8 - 2EF	Serial port 2 (COM2)	
2F8 - 2FF	Serial port 2 (COM2)	
338 - 33F	Serial port 2 (COM2)	
370 - 375	Second floppy disk	
378 - 37F	Parallel port 2 (LPT2)	
3B4 - 3BA	Monochrome monitor port	
3BC - 3BF	Parallel port 1 (LPT1)	
3C0 - 3CF	Video controller	
3D4 - 3DA	Color graphics controller	
3E8 - 3EF	Serial port 1	
3F0 - 3F5	Floppy disk controller	
3F6 - 3F7	Not used	
3F8 - 3FF	Serial port 1 (COM1)	
400 - 43F	Extended DMA controller 1 regitsters	PIIX3

I/O ADDRESS	DEVICE	CHIP
461	Extended NMI registers/reset control	PIIX3
462	Software NMI	PIIX3
480 - 48F	DMA High Page Register	PIIX3
4C0 - 4CF	DMA controller 2, High Base Register	
4D0 - 4D1	Interrupt controller 1 and 2 control register	
4D4 - 4D7	DMA controller 2, Extended mode register	
4D8 - 4DF	Reserved	
4E0 - 4FF	DMA channel Stop Registers	
678 - 67A	Parallel Port (ECP)	
778 - 77A	Parallel Port (ECP)	
7BC - 7BE	Parallel Port (ECP)	
800 - 8FF	NVRAM	
CA9	DISMIC Data Register	
CAA	DISMIC Control/Status Register	
CAB	DISMIC Flags Register	
C84	Board Revision Register	
C85 - C86	BIOS Function Control	
CF8	PCI CONFIG_ADDRESS Register	Located in PMC
CF9	PMC Turbo and Reset control	PIIX3
CFC	PCI CONFIG_DATA Register	Located in PMC
46E8	Video controller	
xx00 - xx1F	Space reserved for the SCSI registers	
xx00 - xxFF	NIC registers mapped in I/O	

ERROR MESSAGES AND CODES

The system BIOS displays error messages on the screen. Before the initialization of the monitor, acoustic signals inform when an error occurs. The error codes detected by the POD are stored in NVRAM, the Extended BIOS Data Area (EBDA). Provided below are the POD error codes, the POD acoustic signal codes and the system error messages.

POD ERROR CODES

Once the video controller is successfully initialized, the BIOS identifies the POD test being run (check point) by writing a 2-digit hex code to I/O port 80h. If an ISA Port-80h board is installed in the system, the code is displayed in hex format. The countdown code indicates the distance within the POD at which the error has occurred. The coundown range goes from 900 to 000 (OS boot). The following table lists the POD check points that are displayed during the boot recovery procedure. Boot recovery is enabled by using jumper J37-E1 on the motherboard and reinitializing the system. The system will boot from the floppy inserted in drive A using the recovery BIOS image that is automatically installed

Check Point (code on port 80)	Countdown code	Description
02h		Internal cache disable
08h		DMA controller 1 and 2 disable, interrupt controller 1 and 2 disable, and video display disable
13h		Initialization of all the chipset registers
15h	900	System timer initialization
1Bh	800	64 KB Real-mode base memory test
20h	700	16 KB base memory test
23h	650	Setup interrupt vectors
40h	600	Memory test in virtual mode
65h	500	DMA controller 8237 initialization
67h	400	Test interrupt controller 8259
80h	300	Interrupt timer, keyboard, unmask diskette
88h	200	Floppy disk initialization
A0h	100	Cache enable
00h	000	Operating system boot

The following table lists the POD check points on port 80 displayed during the normal BIOS process.

Check Point (code on port 80)	Count-down Code	Description
D0h		First MP initialization, switch to real big mode
D1h		Power on initialization
D2h		NMI disable
D3h		Video controller reset
D4h		Switch to real time mode
D5h		8 KB BIOS checksum loaded
D6h		Correct checksum of the loaded BIOS
D7h	900	Check if the keyboard controller buffers (KBC) are free
D8h		Send BAT (Basic Assurance Test) command to the KBC
D9h		Lettura del risultato del test BAT
DAh		Check if the KBC has passed the BAT test
DBh	820	Successful keyboard initialization
DDh		Keyboard and auxiliary device disable
DFh		Disable of both keyboard controllers
E0h	780	PIC preliminary initialization
E1h		Switch to real big mode and chipset and memory initialization
E2h		Timer 2 initialization for the speaker
E3h	760	Timer channel 0 initialization for the system timer

Check Point (code on port 80)	Count-down Code	Description
E4h		Cancellation of every pending parity error
E6h	740	RAM test from 0 to 640 KB
E7h		2 MB memory test and initialization
E8h		RAM error, remap memory partitions and repeat test
E9h		Successful complete RAM test. Parity error cancellation
EAh	730	Set stack at 30:100, cache and shadow BIOS enable
EBh		Code dispatcher initialization
ECh		Set F000h DRAM R/W enable
EDh		Dispatch POD
23h	700	Vector table setup initialization
24h		Interrupt vector table setup
0Dh		Check on CMOS clear jumper
0Eh	690	Check on CMOS validity
0Fh		Force values in CMOS, if requested
10h		Complete CMOS initialization
25h		None
28h		Monochrome mode setup
29h		Color display setup
2Ah		Parity status cancellation, warm reset flag initialization
2Bh		Video autoconfiguration and initialization
F0h		ISA slot initialization
2Ch	580	Search for conventional video option ROM
2Dh		User binary scan
2Eh	570	Monochrome video initialization if there are no other monitors connected
2Fh	560	Monochrome memory buffer test
30h		Check on vertical and horizontal trace
31h		Color video memory test if there is no external video BIOS
32h		Check on vertical trace
34h		Message mark
36h		Message initialization and screen clearing
37h	500	Custom mark on video
80h	370	Keyboard/mouse port check
81h		KBC initialization and testing
83h		Check if the keyboard is locked
F5h	330	Mouse initialization
39h		Keyboard, mouse and other sign-ons
3Bh		Preparation for memory test
43h	290	Memory size fal chipset
4Fh		Cache, memoy test and video memory size disable
52h		Initialization of other processors in MP systems, DMA controller reset
61h	250	DMA register test
62h		DMA test OK
65h		DMA controller 8237 initialization
66h		Cancellation of write request and mask set/reset DMA registers
67h	220	Test controller interrupt 8259
F4h		Extended NMI source enable
8Ch	140	Initialization of other plug & play device (e.g. besides the video), IPL initialization, IDE controller initialization
8Fh	130	Floppy initialization
92h		Printer setup, RS232 timeout
96h		Option ROM scan and initialization above C800h
97h	080	User binary scan and conventional option ROM scan
98h		User binary area scan
9Ah		Soft reset flag cancellation, MP table completion
9Dh	070	Timer data area initialization
A0h		Printer setup
A1h		RS232 setup
A2h		Stuck key verification
ABh		NPX first initialization and testing (math coprocessor)
ACh	060	NPX initialization and testing
ADh		Update of coprocessor data in CMOS and checksum recalculation
AEh		Typematic rate setting
AFh	050	READ ID keyboard command
B0h		Awaiting READ ID reply
A3h		POD error display

Check Point (code on port 80)	Count-down Code	Description
A6h		Setup
A7h	030	Setup recall if requested, password prompt if enabled
B1h		Boot cache enable
B3h		Setup display mode
B4h		Skip to pre-OS code
BBh	020	SMI code initialization, preparation for boot
00h	000	BOOT execution

ACOUSTIC SIGNAL CODES DURING THE POD

An acoustic signal code is a series of individual beeps of the same length which are emitted by the system speaker to identify an error occuring during the POD before the initialization of the monitor and which therefore cannot be displayed. In the event of an error, a long beep followed by two short beeps are emitted to inform that an error occurred. These signals are then followed by a series of beeps of the same length that actually code the error. The following table describes the error which is associated to each beep code and the corresponding check point on port 80.

Number of Beeps	Check Point (Code on Port 80)	Description
1	71h	Error in the memory refresh circuitry on the motherboard
2	72h	Unrecoverable memory parity error
3	73h	Faulty first 4 MB of memory
4	74h	Faulty onboard timer
5	75h	Processor error
6	76h	The keyboard controller gate A20 is off; the BIOS is unable o switch into the protected mode
7	77h	Processor interrupt exception error
8	78h	Video memory read/write error; the video is not present of video memory is not working (not a fatal error)
9	79h	ROM BIOS checksum error
10	7Ah	CMOS RAM shutdown register read/write error

POD ERROR MESSAGES

The following table lists the POD error codes and the associated messages.

CODE	ERROR MESSAGE
0002	Primary Boot Device Not Found
0010	Cache Memory Failure, Do Not Enable Cache
0015	Primary Output Device Not Found
0016	Primary Input Device Not Found
0041	ISA ID Mismatch for Slot
0043	ISA Invalid Configuration for Slot
0044	ISA Configuration NOT ASSURED!
0045	ISA Expansione Board Not Ready in Slot
0047	ISA CMOS Configuration Not Set
0048	ISA CMOS Checksum Failure
0049	ISA NVRAM Invalid
0060	Keyboard Locked. Please Unlock
0070	CMOS Time & Date Not Set

CODE	ERROR MESSAGE
0080	Option has Bad Checksum
0083	Shadow of PCI ROM Failed
0085	Shadow of ISA ROM Failed
0131	Floppy Drive A:
0132	Floppy Drive B:
0135	Floppy Disk Controller Failed
0140	Shadow of System BIOS Failed
0171	CPU Failure - Slot 1, CPU 1
0171	Previous CPU Failure - Slot 1, CPU 1
0191	CMOS Battery Failed
0195	CMOS System Options Not Set
0198	CMOS Checksum Invalid
0289	System Memory Size Mismatch
0295	Address Line Short Detected
0297	Memory Size Decreased
0299	ECC Error Correction Failure
0301	ECC Single Bit Correction Failed, Correction Disabled
0302	ECC Double Bit Error
0310	ECC Address Failure, Partition #
0370	Keyboard Controller Error
0373	Keyboard Stuck Key Detected
0375	Keyboard and Mouse Swapped
0380	ECC DIMM Failure, Board in Slot 1 DIMM #
0430	Timer Channel 2 Failure
0440	Gate-A20 Failure
0441	Unexpected Interrupt in Protected Mode
0445	Master Interrupt Controller Error
0446	Slave Interrupt Controller Error
0450	Master DMA Controller Error
0451	Slave DMA Controller Error
0452	DMA Controller Error
0460	Fail-safe Timer NMI Failure
0461	Software Port NMI Failure
0465	Bus Timeout NMI in Slot
0467	Expansion Board NMI in Slot
0501	PCI System Error
0510	PCI Parity Error
0710	System Board Device Resource Conflict
0711	Static Device Resource Conflict
0800	PCI I/O Port Conflict
0801	PCI Memory Conflict
0802	PCI IRQ Conflict
0803	PCI Error Log is Full

CODE	ERROR MESSAGE
0810	Floppy Disk Controller Resource Conflict
0815	Parallel Port Resource Conflict
0816	Serial Port 1 Resource Conflict
0817	Serial Port 2 Resource Conflict
0818	USB 1
0819	USB 2
0820	Expansion Board Disabled in Slot
0900	NVRAM Checksum Error, NVRAM Cleared
0903	NVRAM Data Invalid, NVRAM Cleared
0905	NVRAM Cleared by Jumper
0982	I/O Expansion Board NMI in Slot
0984	Expansion Board Disabled in Slot
0985	Fail-safe Timer NMI
0986	System Reset caused by Watchdog Timer
0987	Bus Timeout NMI in Slot

Note: *The error messages related to the RAID DPT SCSI controller are given in Appendix C, in the section that deals with the related controller.*

SYSTEM CONFIGURATION UTILITY

The system configuration utilities consist of four to five programs depending on whether the system is equipped with the RAID DPT SCSI controller or not. Two programs, the System Configuration Utility (SCU) and Storage Manager, are stored on the Orchestra CD-ROM provided in the system Starter Kit, the third and fourth programs, BIOS Setup and SCSI Select Utility, are stored in the system BIOS and can be activated directly from the keyboard while the fifth program, DPT Configuration Utility, resides in the firmware of the RAID DPT controller and can therefore be activated directly from the keyboard. The Storage Manager is described in Appendix F, the DPT Configuration Utility is described in the section dealing with the DPT controller in Appendix C, the BIOS Setup and SCSI Select Utility are described in Appendix E 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 rel. 2.0 consists of the following disks:

- **Orchestra Systema Boot.** 3.5" 1.44 MB diskette which is used to boot the system and access the contents of the Orchestra Systema CD-ROM or activate the System Configuration Utility (SCU). This CD also contains the .CMS files containing the current system configuration and a library of ISA configuration files which includes the *.CFG files for the different expansion boards that can be added to the system. The SCU has the following main functions:
  - Provide the configuration and jumper settings of ISA boards
  - Provide information on the resources assigned to the PCI and P&P ISA boards
  - Record any configuration conflict and attempt to solve it automatically
  - Provide and support configuration files (CFG)
  - Create and update the .CMS file on the boot disk as backup of the system's non-volatile memory.
- **Orchestra Systema Diagnostics.** 3.5" 1.44 MB diskette (five languages) containing a 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 if used at user level.
- **Orchestra Systema CD-ROM.** CD-ROM containing all the software that can be installed on the systems including the available configuration utilities. The user interface, called Orchestra Systema, is only available in English. This CD-ROM allows the following major functions:
  - By running the Storage Manager Utility (available for systems equipped with the RAID DPT 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.
  - Provide the online documentation of the boards installed in the basic module.
  - Install the Resilience Support software package (only or 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 following 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.

The Orchestra CD-ROM from rel. 2.1 onwards consists of the following disks:

- **Orchestra Systema Diagnostics.** As the Orchestra Systema CD-ROM 2.0
- **Orchestra Systema CD-ROM.** CD-ROM containing all the software that can be installed on the system, including the available configuration utilities and the System Configuration Utility (SCU). This CD-ROM also contains a library of ISA configuration files which includes the *.CFG files for the different expansion boards that can be added to the system. This CD-ROM allows the following major functions:
  - Provide the configuration and jumper settings of ISA boards
  - Provide information on the resources assigned to the PCI and P&P ISA boards
  - Record any configuration conflict and attempt to solve it automatically
  - Provide and support configuration files (CFG)
  - By running the Storage Manager Utility (available for systems equipped with the RAID DPT 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.
  - Provide the online documentation of the boards installed in the basic module.
  - Install the Resilience Support software package (only or systems in a resilience configuration) which in turn consists of the OLIHIT and OLISAR software packages.
  - Install the Server View software that provides, in a local area network, an intelligent monitoring and signalling system that allows a visual check to be made on the network servers from a Windows workstation.

Note: *In order to be able to activate the SCU from a CD-ROM, the CD-ROM must be enabled to boot. In the SCSI Select Utility, under the Advanced Configuration Options menu, the BIOS Support for Bootable CD-ROM and BIOS Support for INT13 Extensions options must be set to Enabled.*

SYSTEM CONFIGURATION UTILITY

The following table shows the default configuration of the basic system.

SLOT 0 : System Board	
SYSTEM GROUP	
System Identification and Version Information	
System Identification String	IDNODM0
Config and Overlay Version	Overlay version: 1.00 Release
BIOS Version String	BIOS: 1.00.01.DM0
System Processor	Pentium (R) PRO Processor at 200 MHz
System Performance	
Power-On Speed Option	Processor Speed = FAST
MEMORY SUBSYSTEM GROUP	
Base Memory Options	640 KB Base Memory
Shadowing ISA ROMs Options	Press 'Enter' to Modify the Shadowing Options
Extended Memory Options (Cache, 1MB ISA Hole)	
31 MB Extended Memory / 256 KB Cache (WB)	
ON-BOARD DISK CONTROLLERS	
On-Board Floppy Controller	Enable
Primary On-board IDE Controller	Disable
Secondary ON-board IDE Controller	Disable
ON-BOARD COMMUNICATION DEVICES	
Serial Port 1 Configuration	Port:3F8h IRQ:4 (COM 1)
Serial Port 2 Configuration	Port:2F8h IRQ:3 (COM 2)
Parallel Port Configuration	Port:378h IRQ:7 (LPT 1)
Parallel Port Mode	Parallel Port Mode ISA-Compatible
FLOPPY DRIVE SUBSYSTEMS GROUP	
Floppy Drive A Options	3.5 inch 1.44/1.25 MB drive
Floppy Drive B Options	Disable or Not Installed
IDE SUBSYSTEM GROUP	
ISA IDE DMA Transfers	Disable
IDE Configuration - Primary Master	Disable
IDE Drive Options - Primary Master	
Multi-Sector Transfer	Disable
Translation Mode	Auto Configured
Enhanced IDE Mode	Disable
IDE Configuration - Secondary Master	Disable
IDE Drive Options - Secondary Master	
Multi-Sector Transfer	Disable
Translation Mode	Auto Configured
Enhanced IDE Mode	Disable
IDE Configuration - Secondary Slave	Disable
IDE Drive Options - Secondary Slave	
Multi-Sector Transfer	Disable
Translation Mode	Auto Configured
Enhanced IDE Mode	Disable
BIOS LANGUAGE SUPPORT GROUP	
BIOS Language Support Options	
Current BIOS Language	English (US)
KB AND MOUSE SUBSYSTEM GROUP	
Keyboard and Mouse Options	
NumLock Options	OFF at Boot
Tipematic Speed	Auto
Mouse Control Option	Mouse Auto Detected
Console Redirection / Console Redirection Control	
COM Port for Redirection	Disable
Serial Port Baud Rate	115.2 K Baud
Hardware Flow Control	CTS/RTS
Select Terminal Type	ANSI

SECURITY SUBSYSTEMS GROUP	
Amministrative Password Option	Disabled
User Password Option	Disabled
Hot Key Option	Disabled
Lockout Timer	10 minutes
Secure Boot Mode	Disable
Video Blanking	Disable
Floppy Writes	Disable
BOOT SUBSYSTEM GROUP	
Boot Options	
First Boot Device	Boot Floppy
Second Boot Device	Boot hard Disk
Third Boot Device	Boot Disabled
Fourth Boot Device	Boot Disabled
Display '<F1> for Setup' Message during POST	Enable
Require User Interaction on POST Errors	Disable
SCSI ROM BIOS OPTIONS GROUP	
SCSI-A ROM BIOS Scan	Enable
MANAGEMENT SUBSYSTEM GROUP	
System Sensor Control	Press 'Enter' to modify the System Sensors
Speaker Options	Enable
Scan User Flash Area	Disable (see the note)
System Management Options	
System Management Mode	Disable (see the note)
Event Logging	Disable (see the note)
PCI System Error Detection	Enable
Reserved System Resources	
SLOT 16 : PCI ETHERNET DEVICE	
Ethernet (Function 0)	Enabled: Current Configuration
SLOT 17 : PCI VGA DEVICE	
VGA (Function 0)	Enabled: Current Configuration
SLOT 18 : PCI SCSI DEVICE	
SCSI (Function 0)	Enabled: Current Configuration
SLOT 19 : PCI MULTIFUNCTION DEVICE	
ISA Bridge (Function 0)	There are no resources currently assigned to this function
IDE (Function 1)	Enabled: Current Configuration
SLOT 20 : PCI SCSI DEVICE	
SCSI (Function 0)	Free Resources -- Re-assign at next boot

Note: *The three options specified are set to Disabled on the NetStrada 3000 first step, which does not support the Manageability feature. These options are set to Enabled on the NetStrada 3000 second step.*

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 a PCI board, the RAID DPT SCSI controller has 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 DPT Configuration Utility.*

CONFIGURATION OF ISA BOARDS

The System Configuration Utility (SCU) program guides the user in the configuration of ISA AT boards that do not support the Plug and Play feature.

Each optional ISA board comes with a diskette containing a file (with .CFG extension) with information on the resources required by the board for its own configuration and the possible alternative values. The SCU can read this information and suggest which resources can be assigned to the board without generating conflicts. If the board has jumpers or DIP-Switches, the SCU can indicate the specific settings in compliance with the assignment of the resources that has been made.

The system Configuration Utility has a database containing the configuration data for the more common ISA AT boards. Before physically installing a board, add the related .CFG file to the database if this file is not already present.

During the SCU configuration phase, all the resources that can be automatically modified are considered as being available. By installing a new board, therefore, it is also possible that the resources assigned to boards previously installed in the system are changed. In the case of ISA boards equipped with jumpers or DIP-Switches, make sure that the settings made are still valid. To avoid this it is suggested to block, using the specific command, the configuration parameters of the boards that need to be manually configured using jumpers or DIP-Switches. The configuration must be unblocked during the resolution of any conflict between resources.

At the end of the configuration process the information is stored in the motherboard NVRAM so that the system resources are checked each time the system is powered on. With the Orchestra Systema rel. 2.0, the information is also stored in a .CMS file on the Orchestra Systema Boot diskette. This file is updated each time a configuration is made.

Note: *Since it is not possible to write to CD-ROM with Orchestra Systema rel 2.1, listed below are the differences with respect to release 2.0:*

To configure ISA boards and a copy of the configuration in the .CMS file is not required, use the SCU of the Orchestra Systema CD-ROM otherwise copy the SCU onto diskette using the Create User Disk option and configure the system using the User Disk.

To configure ISA boards and the .CFG file related to the board is not contained on Orchestra but is only available on a diskette provided in the board packaging, or the diskette is not even available, copy the SCU on a diskette using the Create User Disk option and configure the system using the User Disk.

Note: *All User Disk functions are self-explanatory and are aided by an online Help facility that can be recalled by pressing the F1 key. The utilities can therefore be correctly executed by following the instructions displayed.*

ORCHESTRA SYSTEMA CD-ROM EVOLUTION

DATE	REL.	REASON FOR CHANGE
10/96	2.0	New Orchestra Systema CD-ROM code 2692539 S and boot floppy code 2692134 M for the NetStrada 3000 first step. This version does not contain Resilience Support nor Server View, and the System Configuration Utility (SCU) rel. 1.00 is contained on the Orchestra Boot diskette. Listed below are the main programs on the CD-ROM: - Support for the following O.S.: NT4.0 - 3.51, NetWare 4.1 - 3.12, OS/2 Warp 3.0 - AIC7880 family SCSI driver, MANAGER SET rel 1.3 - EZ-SCSI 4.0 - EVD 1.0 for Windows 95 - Intel Pro 100 LAN driver for the onboard LAN controller: - Win 95, NT4.0 - 3.51: ver 2.02 - NetWare 4.1 - 3.12: ver 1.46 - OS/2 2.11 - Warp 3.0: ver 1.34 - DPT Storage Manager rel. 2.2 - 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.
1/97	2.1	New Orchestra Systema CD-ROM code 2692215 R for the NetStrada 3000 second step. This version allows the system to be booted directly from CD-ROM and therefore the Orchestra Boot diskette code 2692134 M is eliminated. It differs from the previous version as follows: - System Configuration Utility SCU rel. 1.00 on CD-ROM - Resolution of some of the problems encountered with the previous release - Support for all the expected operating systems - Resilience Support 3.0 with SAR rel 1.0 - Support for NetStrada 3000 - Server View rel. 3.0 - Support for NetStrada 3000 - Eliminated the support for SCO 3.2.4.2 - Support for the RAID DPT controller - Demo on the SIREN system configurations. For the Server View 3.0 and Resilience Support 3.0 packages to work correctly, the BIOS must support the SAR feature and the DMI BIOS data must be written using the SYSID Utility.

USER DIAGNOSTIC EVOLUTION

DATE	REL.	REASON FOR CHANGE
10/96	1.0	New User Diagnostic diskette code 2692136 V for the NetStrada 3000 first step.
1/97	1.0 up2	New User Diagnostic diskette code 2692216 V for the NetStrada 3000 second step.

SYSTEM TEST EVOLUTION

DATE	REL.	REASON FOR CHANGE
10/96	1.0	New System Test. Library ver. DDK 1.07; SCSI library ver. 0.31.

BIOS UPDATE UTILITY

The BIOS is stored in a Flash EPROM that can be cancelled and rewritten to by means of a specific file and utility stored on diskette, without needing to physically replace the BIOS ROM. The BIOS update utility is called FMUP and always updates the video controller and onboard SCSI controller BIOS, the Setup Utilities, the user-defined Flash EPROM area and the nationalization files.

Note: *The ROM Setup nationalization files will be recopied when the BIOS is updated. If a specific nationalization file has been created, it must be recopied upon completion of the BIOS update procedure.*

Note: *Before installing a new BIOS it is important to make a back-up copy of the user-defined flash memory area on hard disk or on diskette.*

The FMUP Utility is used to:

- Save: copy a determined area of flash memory on hard disk or on diskette.
- Update: copy the file from hard disk or diskette and update the corresponding Flash memory area.
- Verify: compare an area of flash memory with the files on hard disk or on diskette to check that the versions are the same and to make sure that the system is using the correct BIOS version.

The new BIOS is contained in .BIx files and the number of files depends on the size of the Flash BIOS area. The system BIOS files are named in the following way: xxxxxxxx.BI0, xxxxxxxx.BI1, xxxxxxxx.BI2, etc.

Note: *The name of the files cannot be changed since the FMUP Utility checks to make sure that they exist before beginning. The first file in the list can be renamed, the others cannot.*

USER-DEFINED FLASH MEMORY AREA

In the BIOS there is a general purpose 8 KB block; the FMUP Utility can update this area with codes and data provided by the user. The file containing the user code which is recognized by the FMUP Utility has the xxxxxx.USR extension. This area can be scanned during the POD to check for the presence of an optional board BIOS. Any BIOS located in this area will be initialized as an optional board BIOS. To enable the scan process select the SCU or Setup "User BIOS Scan" option and assign "Enable" to it.

BIOS UPDATE PROCEDURE

- Insert the diskette containing the FMUP Utility into drive A and power on the system.
- The Main Menu is displayed after the boot phase. Select "Update Flash Memory Area from a File" and press Enter.
- Select "Update System BIOS + User Area" and press Enter.
- Select the path A:*.BIO and press Enter. The BIOS update procedure now begins.
- Repeat the operation using the Extension Code diskette in order to also update the Extension Code BIOS (turn to page 9-27).

Note: *The BIOS update procedure does not cancel the system configuration data stored in CMOS RAM.*

Note: *The BIOS update procedure does not cancel the system identification parameters stored in the Flash EPROM. The parameters are written and read by means of the SYSID Utility (see Appendix M).*

BIOS RECOVERY THROUGH BOOT BLOCK

The BIOS recovery procedure must be used in case the BIOS .Blx files are corrupt or if the BIOS update procedure was unsuccessful due to, for example, a power failure. Flash memory contains a protected Boot Block area that cannot be corrupted so the code in this area can be used to boot the system from drive A even though the BIOS is corrupt. This recovery code boots the system from drive A and runs a specific AUTOEXEC.BAT file provided with the BIOS version. This batch file activates the FMUP that automatically restores the system BIOS from the files on diskette.

Note: *Before beginning the BIOS recovery procedure, check whether the BIOS of an added board is mapped within the E0000 address range; in this case the board must be mapped in another area before beginning the recovery procedure or removed from the system.*

Note: *Exit from Windows and disable EMM386 before running the FMUP Utility. This utility must be launched without the the presence of a 386 control program such as Windows or EMM386.*

The recovery procedure only updates the system BIOS. The display is not initialized and the keyboard is disabled. Since there is nothing displayed, a series of beep codes are generated as indicated in the following table:

RECOVERY BEEP CODES	DESCRIPTION
1	Indicates the beginning of the recovery procedure; the process lasts 2 to 4 minutes
2	Indicates the successful outcome of the recovery process
4	The system was unable to boot from diskette
Continuous series of low beeps	One or all of the following causes occurred: - The files of an incorrect recovered BIOS have been used - The"boot option" configuration jumper is in the wrong position. This option allows BIOS recovery - One or more files of the system BIOS FMUP Utility are corrupt or missing

BIOS recovery requires at least 4 MB of RAM installed, a 3.5" 1.44 MB drive A and a diskette containing the FMUP Utility.

Proceed as follows to recover the BIOS:

- Power off the system and the connected peripherals, then access the motherboard.
- Locate the boot recovery jumper J37 E1 and move it from "RECOVERY BOOT DISABLED" (default) to "RECOVERY BOOT ENABLED".
- Reassemble the system and insert the diskette containing the FMUP Utility into drive A. Power on the system; a single beep is sounded to inform that the system is being booted.
- Another single beep is sounded to indicate the beginning of the recovery procedure during which the monitor and keyboard are disabled. This procedure lasts from two to four minutes.
- Two beeps are sounded when the procedure ends successfully; if errors occur, beeps will be sounded as indicated in the above table.
- Make sure that the diskette drive LED is off, remove the FMUP diskette from drive A, power off the system and access the motherboard.
- Locate the boot recovery jumper J37 E1 and move it from "RECOVERY BOOT ENABLED" to "RECOVERY BOOT DISABLED" (default).
- Reassemble the system and check that the updated BIOS version is displayed during the boot phase.
- Run the SCU to check the configuration of the system.

NetStrada 3000 UPGRADE STARTER KIT

The NetStrada 3000 step 1 released in October 1996 does not support the *System Automatic Restart (SAR)* and *Manageability* features, and the Orchestra 2.0 CD-ROM does not contain Resilience Support and Server View. The Manageability feature enables the system to send and store messages if the values detected by the sensor are not included within the ranges specified in the BIOS. These features are available on the NetStrada 3000 step 2 released in January 1997. The upgrade Starter Kit, code 214711 Y, is used to upgrade the system from step 1 to step 2. This kit includes:

- Orchestra rel 2.1 CD-ROM (code 2692215 R)
- User Disk Diagnostic (code 2692216 V)
- Getting Started (code 2692556 F)
- Last Minute Information (code 2692560 S)
- NetStrada 3000 Set Default Utility 1.0 (code 2692176 Z)
- NetStrada 3000 BIOS and Flash Eprom Utility (code 2692213 Y)
- NetStrada 3000 BIOS Extension Code and Flash Eprom Utility 1.01 (code 2692214 M)
- System Upgrading (code 2692564 Y).

To upgrade the system proceed in the following order:

1 Flash the BIOS using the BIOS diskette and then flash the BIOS Extended Code using the Extended Code diskette.

2 Set the sensors to their default settings, using the Set Default Utility diskette, and then enable the Manageability feature by using the BIOS-resident Setup Utility .

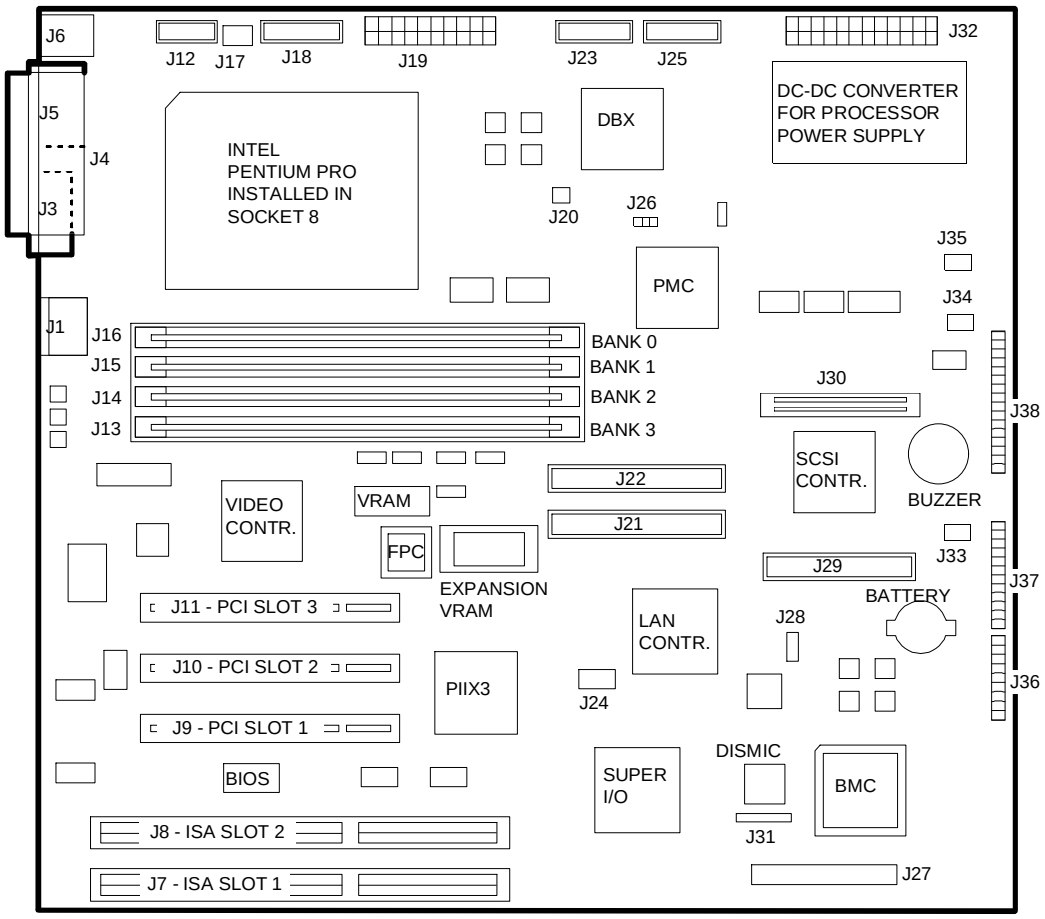
FLASHING THE BIOS AND BIOS EXTENDED CODE

- Insert the BIOS diskette into drive A and power on the system. The FMUP.EXE utility is automatically activated after the boot phase; press Enter to continue.
- Using the cursor movement keys, select *Update FLASH Memory Area From File* and press Enter, then select Update BIOS+User Area and press Enter.
- Press the TAB key to select (*.BIO) and press Enter.
- Go to the next menu and press Enter again.
- Once flashing is complete, remove the BIOS diskette and insert the Extension Code diskette. Press Enter to reboot the system.
- The FMUP.EXE utility is activated after the boot phase; press Enter to continue.
- Using the cursor movement keys, select *Update FLASH Memory Area From File* and press Enter, then select *Update User Data Area* and press Enter.
- Press the TAB key to select the file to be loaded (*.USR) and then press Enter.
- Go to the next menu and then press Enter again. Once flashing is complete, remove the diskette and press Enter to reboot the system.

SETTING DEFAULT VALUES AND ENABLING MANAGEABILITY

- Insert the Set Default Utility diskette into drive A and boot the system.
- Select *1) Update Sensor Value* and press Enter. After the message *Done!* is displayed the system returns to the DOS prompt. Reboot the system.
- Press the F1 key to activate the BIOS Setup Utility, select the *Advanced* and *Advanced Chipset Configuration* menus.
- Set the *SMM Feature*, *Event logging* and *User Flash Scan* options to Enabled, then reboot the system.

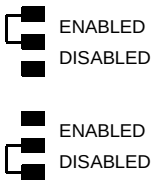
MOTHERBOARD BA2315



J1 LAN connector
J3 VGA video interface connector
J4 LPT1 parallel port connector
J5 First COM1 serial port connector
J6 Double connector:
High - mouse, Low - keyboard
J7 ISA slot 1
J8 ISA slot 2
J9 PCI slot 1
J10 PCI slot 2
J11 PCI slot 3
J12 Second COM2 serial port connector
J13 Memory bank 3 socket
J14 Memory bank 2 socket
J15 Memory bank 1 socket
J16 Memory bank 0 socket
J17 Active heatsink fan connector for the 5 V Pentium PRO (not used)
J18 Swap board connector
J19 Power supply connector
J20 Fan connector FAN2 for the 12 V processor (not used)
J21 Primary IDE0 HDU connector (not used)
J22 Secondary IDE1 HDU connector (not used)
J23
J24 Auxiliary Power connector (not used)
J25 HDU Activity LED connector (not used)
J26 ITP connector (not fitted, used for debugging)
J27 Test connector (not fitted)
Server Monitor connector (to the Server
J28 Management Module SMM board)
J29 I2C bus connector (to the SMM board)
J30 Floppy interface connector
J31 Internal SCSI Wide connector
ISP connector (not fitted, used for
J32 processor debugging)
J33 Main Power connector (not used)
FAN1 fan connector (to the fan under the
J34 HDUs)
J35 FAN0 fan connector (not used)
J36 FAN3 fan connector (not used)
J37 Configuration jumpers
J38 Configuration jumpers
AT Header jumpers

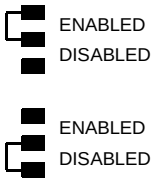
JUMPERS J36

Configuration By-Pass Jumper (A1 - CMOS CLEAR)



A1	DESCRIPTION
ENABLED	The system is set according to the default configuration and the configuration stored in EEPROM is ignored. The message "ERROR905: NVRAM cleared by Jumper" is displayed
DISABLED *	Normal setting, at power on the system is set according to the configuration stored in EEPROM

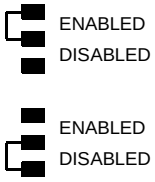
Password Clear Jumper (B1 - PASSWORD CLEAR)



B1	DESCRIPTION
ENABLED	The keyboard, power on and administrator password is cleared during system reset
DISABLED *	Normal setting, the system password is maintained even after a reset (default setting)

9

Flash EEPROM Protection Jumper (C1 - FLASH BOOT BLOCK)

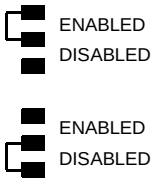


C1	DESCRIPTION
ENABLED	The BIOS boot block is write protected (default setting). In this condition the BIOS EEPROM can be cancelled and reprogrammed
DISABLED *	The BIOS boot block is write protected (default setting). In this condition the BIOS EEPROM cannot be cancelled nor rewritten

Note: *An incorrect BIOS boot block programming can prevent the system from booting. The BIOS is structured in blocks, and the write protection does not allow any of these blocks to be cancelled. If a power failure occurs during the rewriting of the BIOS, the system can be booted from floppy disk if this block is integral.*

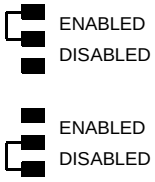
JUMPERS J37

Chassis Intrusion Detection Jumper D1



D1	DESCRIPTION
ENABLED	Not used
DISABLED *	Setting to be used

Normal boot or Recovery boot Jumper E1

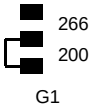


E1	DESCRIPTION
ENABLED	If the BIOS is damaged, this jumper setting enables the system to be booted from the recovered BIOS having inserted the diskette containing the FMUP Utility (BIOS recovery) into drive A.
DISABLED *	The BIOS is located in the high area of the Flash and is write protected so that it can be read by the system (default setting)

Processor Core Clock Jumper F1

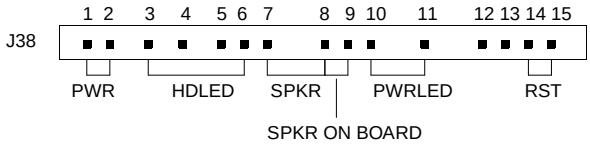
SETTING 160	SETTING 180	DESCRIPTION
ON	OFF	166 MHz core clock (not used)
OFF	ON	180 MHz core clock (not used)

Processor Core Clock Jumper G1



SETTING 200	SETTING 266	DESCRIPTION
ON	OFF	200 MHz core clock (setting to be used)
OFF	ON	266 MHz core clock (not used)

JUMPERS J38



THE SMALL SQUARES IDENTIFY THE PINS THAT ARE PRESENT: THE CONNECTIONS BETWEEN THE PINS ARE NOT JUMPERS BUT A SERIGRAPH INDICATING THE FUNCTION OF THE PIN

J38 PINS	DEFAULT	DESCRIPTION
1-2 PWR	OFF	Not used; the ON/OFF switch could be connected to these pins
3-6 HDLED	OFF	Not used; the HDU LED could be connected to these pins
7-8 SPKR	OFF	Not used; the buzzer could be connected to these pins
8-9 SPKR ON	ON	This jumper is always present and must be ON; enables the operation of the onboard buzzer
10-11 PWRLED	OFF	Not used; the ON/OFF HDU could be connected to these pins
14-15 RST	OFF	Not used; the reset button could be connected to these pins

MICROPROCESSOR

The motherboard uses a 200/66 MHz Pentium PRO 200-256 or 200/66 MHz Pentium PRO 200-512 processor installed in a Zero Insertion Force, dual-cavity, 387-pin Socket 8. The processor core works at 200 MHz, the bus at 66 MHz. The motherboard is equipped with the processor core frequency selection jumpers J37 (see the previous section).

CORE CLOCK	CPU BUS CLOCK	PCI CLOCK	SETTING
166 MHz	66 MHz	33 MHz	Not used
180 MHz	60 MHz	30 MHz	Not used
200 MHz	66 MHz	33 MHz	Default

The processor has a 16 KB internal cache and a 256 KB secondary cache in the case of the PPRO 200-256 or 512 KB for the PPRO 200-512. The processor with a 256 KB cache can be replaced by the processor with a 512 KB cache, or it can be replaced by the future Intel OverDrive processors. On the motherboard there is a DC/DC converter that provides power to the processor core, drawing it from the +5 V. It is the processor itself that informs the DC/DC converter of the voltage required (from 2.4 V to 3.4 V). A passive heatsink is used to cool down the processor.

Note: *If the PPRO 200-256 is replaced by the PPRO 200-512 of kit APU 200P6-512, do not use the active heatsink provided in the kit but re-use the one on the PPRO 200-256.*

MEMORY EXPANSION DIMMS

The motherboard has four 168-pin sockets for the installation of 3.3 V DIMMs. The memory controller 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. When DIMMs are either installed or removed, simply power on the system again and run the ICU; there are no hardware jumper settings to be made.

Listed below are the rules to follow when configuring memory:

- The system sees its own memory as being divided into four banks (0, 1, 2, 3). Each bank consists of one socket on the motherboard. Bank 0, socket J16; Bank 1, socket J15; Bank 2, socket J14; Bank 3, socket J13. The DIMMs can also be installed individually.
- The motherboard can host DIMMs of different capacities.
- The minimum system memory has a capacity of 32 MB expandible to 512 MB.
- Always install the DIMMs starting from bank 0 and in the following order: socket J16, J15, J14 and J13.

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 provides some of the possible system memory configurations.

TOTAL MEMORY	BANK 0	BANK 1	BANK 2	BANK 3
	SOCKET J16	SOCKET J15	SOCKET J14	SOCKET J13
32 MB	8 MB	8 MB	8 MB	8 MB
32 MB	8 MB	8 MB	16 MB	
48 MB	8 MB	8 MB	16 MB	16 MB
56 MB	8 MB	16 MB	16 MB	16 MB
48 MB	8 MB	8 MB	32 MB	
80 MB	8 MB	8 MB	32 MB	32 MB
104 MB	8 MB	32 MB	32 MB	32 MB
80 MB	8 MB	8 MB	64 MB	
144 MB	8 MB	8 MB	64 MB	64 MB
200 MB	8 MB	64 MB	64 MB	64 MB
144 MB	8 MB	8 MB	128 MB	
272 MB	8 MB	8 MB	128 MB	128 MB
392 MB	8 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
64 MB	16 MB	16 MB	32 MB	

TOTAL MEMORY	BANK 0	BANK 1	BANK 2	BANK 3
	SOCKET J16	SOCKET J15	SOCKET J14	SOCKET J13
96 MB	16 MB	16 MB	32 MB	32 MB
112 MB	16 MB	32 MB	32 MB	32 MB
96 MB	16 MB	16 MB	64 MB	
160 MB	16 MB	16 MB	64 MB	64 MB
208 MB	16 MB	64 MB	64 MB	64 MB
160 MB	16 MB	16 MB	128 MB	
288 MB	16 MB	16 MB	128 MB	128 MB
400 MB	16 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
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
256 MB	64 MB	64 MB	128 MB	
384 MB	64 MB	64 MB	128 MB	128 MB
448 MB	64 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

Warning:

Some DIMM combinations are not supported by BIOS release 1.00.01.DM0, however there are no problems with the successive releases. The following table lists the memory combinations that cause error.

TOTAL MEMORY	BANK 0	BANK 1	BANK 2	BANK 3
	SOCKET J16	SOCKET J15	SOCKET J14	SOCKET J13
96 MB	16 MB	16 MB	32 MB	32 MB
96 MB	64 MB	32 MB		
96 MB			64 MB	32 MB

VIDEO CONTROLLER

The onboard SVGA video controller is the Cirrus CL_GD54M40 which is implemented on the PCI bus. Video memory has a capacity of 1 MB. The following table lists the supported resolutions.

Standard Video Mode

Mode	Resolution/Colors	Pixel Rate (MHz)	Horizontal Frequency (KHz)	Vertical Frequency(Hz)	Memory (KB)	Colors
0H, 1H	360x400	14	31.5	70	256	16/256K
2H, 3H	720x400	28	31.5	70	256	16/256K
4H, 5H	320x200	12.5	31.5	70	256	4/256K
6H	640x200	25	31.5	70	256	2/256K
7H	720x400	25	31.5	70	256	Monochr.
DH	320x200	12.5	31.5	70	256	16/256K
EH	640x200	25	31.5	70	256	16/256K
FH	640x350	25	31.5	70	256	Monochr.
10H	640x350	25	31.5	70	256	16/256K
11H	640x480	25	31.5	60	256	2/256K
12H	640x480	25	31.5	60	256	16/256K
12+H	640x480	31.5	31.5	75		16/256K
13H	320x200	12.5	31.5	70		256/256K

Extended Video Mode

Mode	Resolution	Pixel Rate (MHz)	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Memory (KB)	Colors
14,55H	1056x400	41.5	31.5	70	512	16/256K
54H	1056x350	41.5	31.5	70	512	16/256K
58,6AH	800x600	40	37.8	60	512	16/256K
58,6AH	800x600	49.5	46.9	75	512	16/256K
5CH	800x600	36	35.2	56	512	256/256K
5CH	800x600	40	37.9	60	512	256/256K
5CH	800x600	49.5	46.9	75	512	256/256K
5DH	1024x768	44.9	35.5	87	512	16/256K interlaced
5DH	1024x768	65	48.3	60	512	16/256K
5DH	1024x768	75	56	70	512	16/256K
5DH	1024x768	78.7	60	75	256	16/256K
5FH	640x480	25	31.5	60	512	256/256K
5FH	640x480	31.5	37.5	75	512	256/256K
60 H	1024x768	44.9	35.5	87	1024	256/256K interlaced
60 H	1024x768	65	48.3	60	1024	256/256K
60 H	1024x786	75	56	70	1024	256/256K
60 H	1024x768	78.7	60	75	1024	256/256K
64 H	640x480	25	31.5	60	1024	64K
64 H	640x480	31.5	37.5	75	1024	64K
65 H	800x600	36	35.2	56	1024	64K
65 H	800x600	40	37.8	60	1024	64K
65 H	800x600	49.5	46.9	75	1024	64K
66 H	640x480	25	31.5	60	1024	32K direct/256 mixed
66 H	640x480	31.5	37.5	75	1024	32K direct/256 mixed
67 H	800x600	40	37.8	60	1024	32K direct/256 mixed
67 H	800x600	49.5	46.9	75	1024	32K direct/256 mixed
6C H	1280x1024	75	48	87	1024	16/256K interlaced

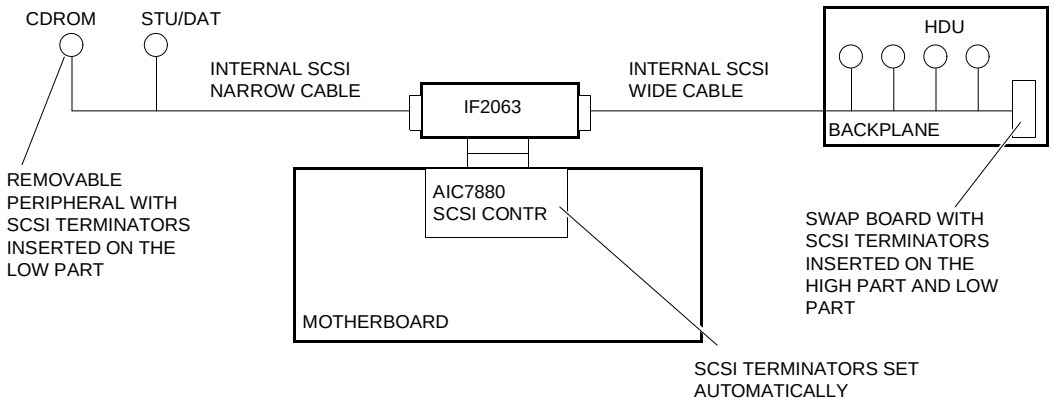
GOVERNO SCSI

The SCSI controller embedded on the motherboard is implemented on the PCI bus and provides a single-ended Ultra Wide (16-bit) SCSI channel based on the Adaptec AIC7880 controller. This chip is a bus master interface controller that can take control of the bus and transfer information to system memory at the maximum speed allowed on the PCI bus (133 MB/sec). The controller handles the 8-bit Fast SCSI Narrow interface providing 10 MB/sec data transfers, the 16-bit Fast SCSI Wide interface providing 20 MB/sec data transfers and the 16-bit SCSI Ultra Wide interface providing 40 MB/sec data transfers.

On the motherboard there is also one 68-pin high density SCSI Wide connector J8. SCSI bus distribution board IF2063 is attached to connector J8 so that HDUs and removable peripherals can be connected. There are three SCSI connectors on this board:

- 68-pin male internal Wide connector for the connection of the SCSI distribution board to onboard connector J8
- 68-pin female internal Wide connector used for the connection of internal Wide / Ultra Wide SCSI HDUs by means of the SCSI backplane.
- 50-pin internal Narrow connector used for the connection of the internal removable SCSI Narrow peripherals.

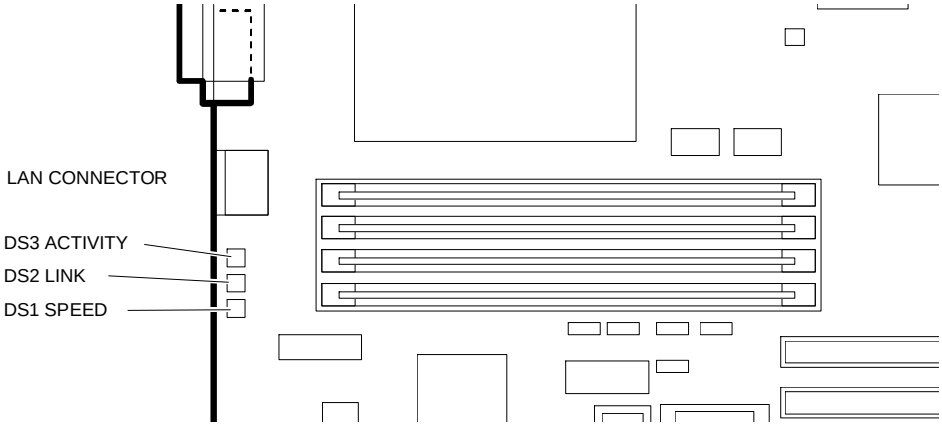
Up to 16 SCSI devices can be connected to the SCSI Wide channel, controller included. These devices can be assigned IDs ranging from 0 to 15, but this system only uses IDs from 0 to 7. The SCSI controller must always have a SCSI ID of 7, set by means of the SCSI Select Utility
The SCSI terminators are present on the motherboard, are active and are automatically configured without the need of operator intervention.
The configurations of peripherals are described in the chapter entitled "Configuration of Peripherals with a Copper Box", while the SCSI Select Utility is described in Appendix E.
There are no SCSI configuration jumper settings to be made on the motherboard.
The following block diagram shows the path of the SCSI channel with HDUs and removables connected to the onboard SCSI controller.



LAN CONTROLLER

The motherboard hosts a 10BASE-T/100BASE-TX LAN controller that uses the Fast Ethernet PCI bus Controller 82557 physical interface components 83040 and 83223. The 82557 is interfaced on the PCI bus and works as a bus master with a maximum transfer rate of 133 MB/sec. The Network ID is stored in the Flash EEPROM on the motherboard. The motherboard has three LEDs that inform on the status of the network.

NETWORK STATUS LED	LED STATUS	DESCRIPTION
DS3 Activity	ON or flashing	The LAN controller sends or receives data over the network. The LED flashing frequency depends on network traffic.
	OFF	The LAN controller does not send nor receive data over the network.
DS2 Link	ON	Valid link on the LAN: the LAN controller and HUB are powered; the controller-HUB connection cable is operational
	OFF	The LAN controller and HUB are not powered; the controller-HUB connection cable is not operational or there is a problem with the configuration of the driver.
DS1 Speed	ON	The LAN controller works at a 100 Mbps transfer rate
	OFF	The LAN controller works at a 10 Mbps transfer rate



SEQUENCE OF BOARDS IN THE MOTHERBOARD SLOTS

Board Name	Max. No. of Boards	Slot	Connector
PCI BUS			
Full size PCI board	3	Slot 1 Slot 2 Slot 3	J9 J10 J11
ISA BUS (all bus master slots)			
Full size ISA board	2	Slot 1 Slot 2	J7 J8

Notes:

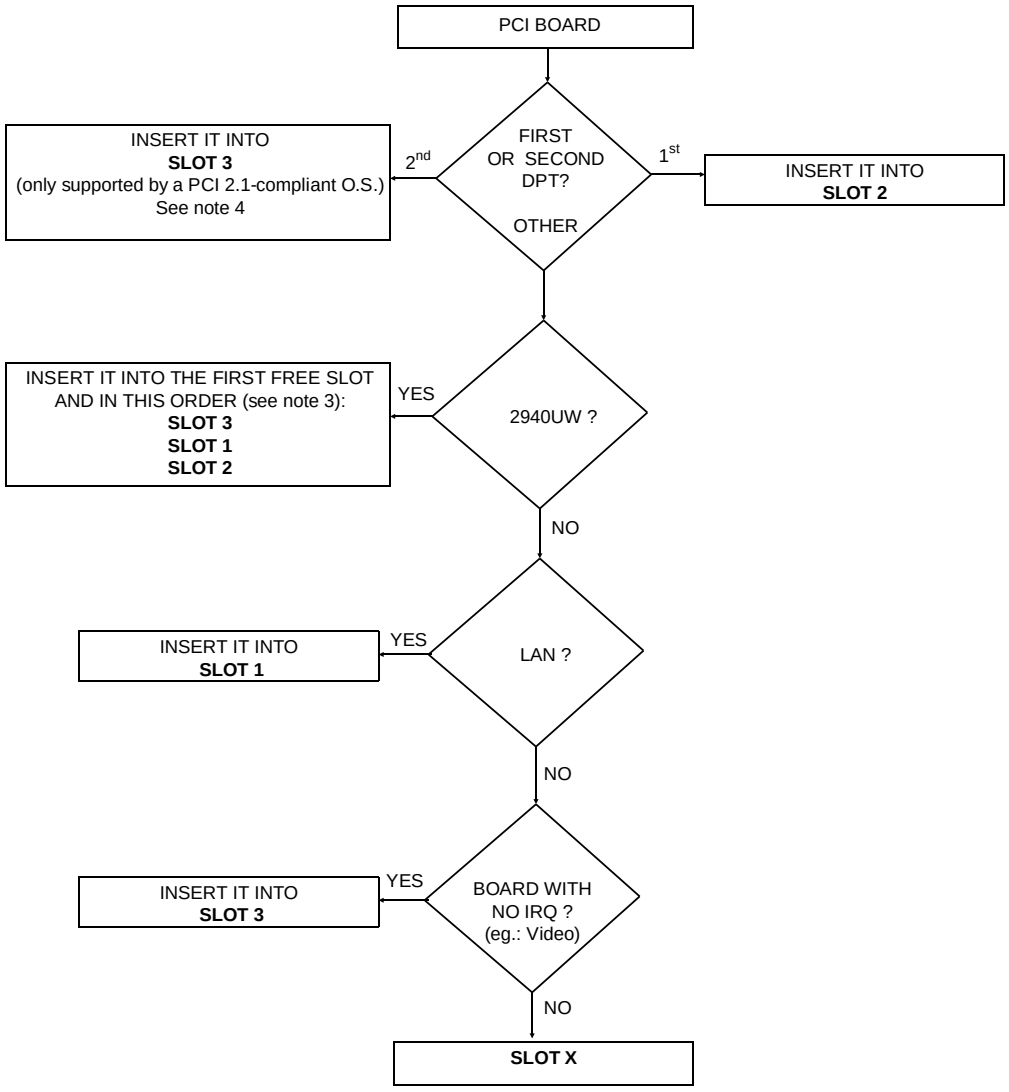
1 *During system boot the BIOS scans the PCI slots in the following order: PCI slot 1, onboard SCSI controller, PCI slot 2 and PCI slot 3.*

2 *There are no priorities concerning ISA slots, however it is suggested to:*
- Insert the STALLION board in slot 2
- Insert the HOBBES board in slot 1.

3 *The optional AHA2940UW SCSI controller must be installed in PCI slot 3; if due to configurability problems it must be installed in PCI slot 1, during the configuration of the board with the SCSI Select Utility set the "Include BIOS Scan" option to NO and the "Host Adapter BIOS" option to "Disabled".*

4 *Up to two DPT SCSI controllers can be installed in the system. The first DPT controller must be installed in PCI slot 2 while the second in PCI slot 3. If installed in PCI slot 3, problems may occur with operating systems that are not compatible with the 2.1 specifications since the interrupt of this slot is shared with the onboard SCSI controller and the software is not always able to detect whether the interrupt originates from the onboard SCSI controller or from the DPT controller.*

FLOW CHART ON THE INSTALLATION OF A BOARD ON THE PCI BUS



BOARD BA2315 EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
10/96	Nasc	212794 S	New board. The first BIOS release is 1.00.01.DM0 code 214763 C lev. Nasc. The BIOS evolutions are described further on.	Factory
2/97	01		Corrected the Pentium PRO step B1 reset: add 470 Ohm (pitch 0805 5%) resistor R411. This modification does not affect the operation with the current processor step (B0).	Factory

ROSEWOOD BIOS EVOLUTION FOR THE BA2315

DATE	LEV.	BIOS	CODE	REASON FOR CHANGE
10/96	Nasc	1.00.01 .DM0	214763 C	New BIOS on the NetStrada 3000 step 1. This BIOS release does not support the SAR and Manageability features.
1/97	01	1.00.02 .DM0		New BIOS on the NetStrada 3000 step 2. The main differences with respect to the previous release are the following: - Support for the SAR feature. - Solved the problems with the installation of the DPT board with NT 3.51 due to conflicts with nonexistent EISA I/O locations. - Support for the Manageability feature. - Solved the problems with some memory configurations using 16 MB DIMMs. - SCSI BIOS Adaptec 1.26 to support boots from CD-ROM. - Solved the problems with the configuration with the AHA2940 board. - Support for 38400 baud rates for the serial ports. - Elimination of the "Warning Resource Conflict" when using IRQ15. - Handling of the Pentium PRO 200-512 Step B1 CPU

Note: *Kit code 214711 Y allows the upgrading of the BIOS on the first series NetStrada 3000 (step 1) models to step 2. To upgrade the BIOS, this kit has the following utilities: "NetStrada 3000 Set Default Utility", "NetStrada 3000 BIOS and Flash Eprom Utility" and "NetStrada 3000 BIOS Extension Code and Flash Eprom Utility". The BIOS upgrade procedure is described in the section entitled "NETSTRADA 3000 UPGRADE STARTER KIT".*

Note: *From February 1997 Intel is no longer producing the step B0 PPRO processors which will therefore be replaced by the PPRO 200/512 Step B1 code 4893196M when out of stock. The system with the Step B1 processor must have BIOS rel. $\geq$ 1.00.02.DM0 which correctly recognizes the new step processor.*

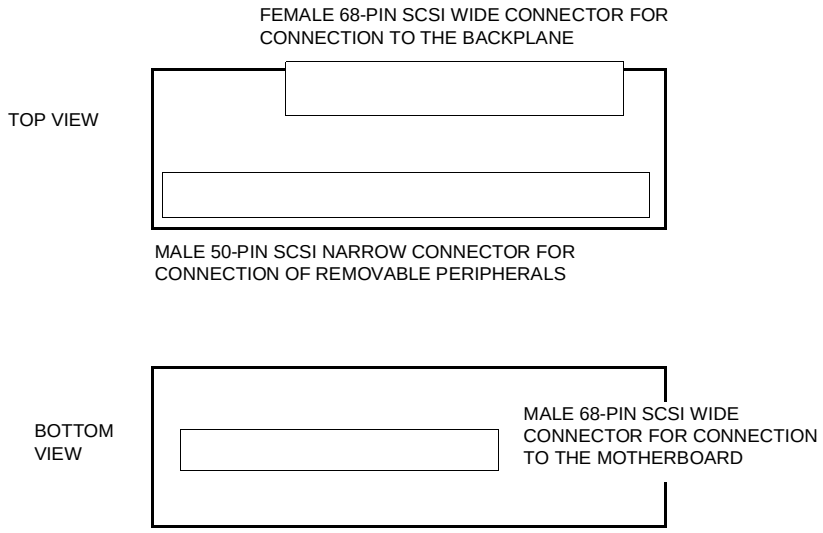
SCSI CHANNEL DISTRIBUTION BOARD IF2063

The motherboard has only one female 68-pin SCSI Wide connector J8; the SCSI channel distribution board with the following three connectors must be attached to onboard connector J8 so that the HDUs and removable SCSI peripherals can be connected:

- Male 68-pin for connection to the motherboard
- Female 68-pin for connection to the SCSI cable for connection to the backplane
- Male 50-pin for connection to the SCSI cable for removable peripherals.

The system always comes with the SCSI channel distribution board, a SCSI Wide cable connecting the distribution board to the SCSI backplane and the SCSI Narrow cable for removable peripherals.

If the HDUs in the basic module are connected to the Ultra Wide SCSI DPT controller, disconnect the HDU SCSI cable from board IF2063 and connect it to the DPT SCSI controller. The SCSI cable of the removable peripherals remains connected to the distribution board. In this case the SCSI controllers need to be terminated differently as indicated in the chapter "Configuration of the Peripherals with a Copper Box".



BOARD IF2063 (P.c.b. code 654537 T) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
10/96	Nasc	212788 C	New board.	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 prevent the HDU slides from causing the loss of the hot swapping feature.
- NetStrada 3000 step 1 released in October 1996 has the following limitations:
  - The O.S. released are: NT3.51/4.0, Novell NetWare 3.12/4.1, OS/2 Warp 3.0
  - The RAID DPT board and duplexing configuration are not supported; all the SCSI devices are connected to the onboard SCSI controller.
  - SAR, Manageability, Resilience Support and Server View are not supported.

  These limitations will be removed with NetStrada 3000 step 2 released in January 1997. Update kit code 214711 Y is used to upgrade the NetStrada step 1 to step 2.
- 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
PCI_INTA_L	PCI interrupt level A to the PIIX3.	To slot 1 as INTA_L To slot 2 as INTB_L To slot 3 as INTC_L
PCI_INTB_L	PCI interrupt level B to the PIIX3. This interrupt level is also used by the onboard LAN controller	To slot 1 as INTB_L To slot 2 as INTC_L To slot 3 as INTD_L
PCI_INTC_L	PCI interrupt level C to the PIIX3. This interrupt level is also used by the onboard SCSI controller.	To slot 1 as INTC_L To slot 2 as INTD_L To slot 3 as INTA_L
PCI_INTD_L	PCI interrupt level D to the PIIX3.	To slot 1 as INTD_L To slot 2 as INTA_L To slot 3 as INTB_L

Example 1: a PCI board that interrupts on INTA_L and which is plugged into slot 3, is interpreted by the system as INTC_L which is already used by the onboard SCSI controller. INTC_L can only be shared with another LAN 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_L and which is plugged into slot 1, is interpreted by the system as INTB_L which is already used by the onboard SCSI controller. INTB_L can only be shared with another LAN controller that uses similar drivers and not with a SCSI 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 INTC_L and which is plugged into slot 1, is interpreted by the system as INTC_L which is already used by the onboard SCSI controller. INTC_L 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 4: a PCI board that interrupts on INTA_L and which is plugged into slot 1, is interpreted by the system as INTA_L which is available.

Example 5: a PCI board that interrupts on INTA_L and which is plugged into slot 2, is interpreted by the system as INTD_L which is available.

- The optional AHA2940UW SCSI controller must be installed in PCI slot 3; if due to configurability problems this controller is installed in PCI slot 1, set the "Host Adapter BIOS" option to "Disabled" during the configuration of the board with the SCSI Select Utility.
- In the case of Main system + PEM with RAID configurations consisting of disks distributed on more than one channel of the same controller (GO2173), system power ons and offs must all be made on the UPS that supports the Main system and PEM; it is therefore suggested to lock the ON/OFF switches of the two boxes to the ON position using the appropriate keys.
- The Orchestra CD-ROM contains a SIREN demo; for program limitations see the description given in the release note contained in the Orchestra CD-ROM.
- When exiting from the DPT Storage Manager in complex RAID configurations, the following message can be displayed:
  "Either memory is insufficient to run KRNL386.exe or the value....."
  and the system crashes. Power the system off and then on again, and then reload Orchestra.
- When replacing the PPRO 200-256 processor with the PPRO 200-512 processor provided in the APU 200P6-512 kit, do not use the active heatsink contained in the kit but fit the passive heatsink of the PPRO 200-256 on the new processor.

OPERATING SYSTEMS

- The ZX312 board with the OS/2 Warp 3.0 operating system must only be installed in PCI slots 1 or 2.
- With the Novell NetWare 3.12 and 4.11 operating system, the Ultra Wide DPT GO2173 board cannot use interrupt IRQ9. Another IRQ can be assigned to the board (for example IRQ5).
- With the NT 3.51 operating system on systems whose HDUs have been cancelled using the CLEANPRO utility, set the "Enable translation for HDU > 1GB" parameter of the SCSI Select Utility to "Disable" so as to avoid problems during the installation of the operating system.
- To install the SCO Open Server 5.0x operating system, when SCSI controllers of the same kind are installed (for example two Adaptec), the boot CD-ROM and HDU must be connected to the same channel and the CD-ROM must have a SCSI ID=5. There are no limitations if the removables and HDUs are connected to two different kinds of SCSI controllers (for example the removables to the Adaptec and the HDUs to the RAID DPT).

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