

SNX 160/N (URANOS)

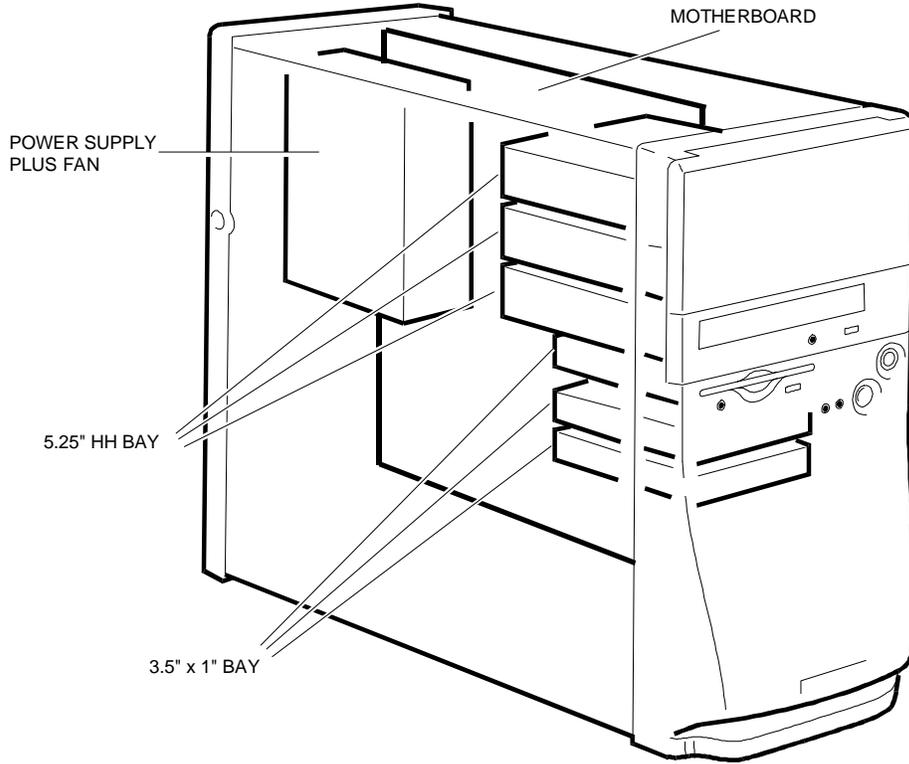
CHARACTERISTICS

Microprocessor	133/66 MHz Intel PENTIUM 133 or 166/66 MHz Intel PENTIUM 166
Overdrive Processor	Possibility of replacing the processor installed in the ZIF Socket 7 with future OverDrive processors supported by ZIF Socket 5
Chipset	Intel Triton II
Dual-bus architecture	16-bit ISA (Industry Standard Architecture) 32-bit PCI (Peripheral Component Interconnect)
Expansion slots	7 slots: 3 ISA, 2 PCI, 1 shared ISA/PCI
Cache size	8 KB integrated in the processor + 256 KB of second level, pipeline burst, write-back cache. The 256 KB cache can be optionally replaced by a 512 KB cache
RAM	16-192 MB provided by ECC fast page mode SIMMs with parity checking
Cabinet	HAL box (Table Top)
Fan	The system is cooled down by the fan incorporated in the power supply
SVGA video controller embedded on the controller	ATI-264VT connected to the PCI bus, with 1 MB of video memory (expandible to 2 MB)
Onboard SCSI controller	Board AHA 2940 installed on the RISER expansion bus (or two AHA 2940 boards for the hard disk duplexing feature)
HDU duplexing	Obtained using two AHA 2940 SCSI controller boards installed on the RISER expansion bus; this feature copies the contents of a hard disk into another one so as to prevent the loss of data in the event of failures
Onboard multiport serial controller	Stallion GO2175 (C-MUX 8-32/I) ISA multiport board for the management of up to 32 RS-232D asynchronous channels through external distribution boxes (see Appendix D)
Onboard network controller	Ethernet Z'NYX ZX312 LAN board with a PCI interface and connectors for 10BaseT, 10Base2 and 10Base5

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Note: *The commercial name of the SNX 160/N remains unchanged for the 133 MHz and 166 MHz versions. For simplicity and whenever necessary, this guide will distinguish between these versions as follows: SNX 160/N 133; SNX 160/N 166.*

SNX 160/N BASIC MODULE



UPDATE LEVELS OF THE MAIN COMPONENTS ON THE FIRST SERIES SNX 160/N MODELS

MOTHERBOARD BA2322 lev. 02AG	BIOS Rev. 1.00.05.CV2Y	POWER SUPPLY SP 160R ASTECC VL 202-3425-200 lev Nasc
ORCHESTRA CD-ROM ICU 1.45	USER DIAGNOSTIC 1.01	SYSTEM TEST 1.01

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

OPERATING SYSTEMS

OPERATING SYSTEM TESTED AT PRODUCT RELEASE	NOTES
MS-Windows NT 4.0: - MS-Windows NT Server Operating System Ver 4.0	For network management
Novell NetWare 3.12: - Advanced Network Operating System for Business Computing Ver. 3.12	For network management
Novell NetWare 4.11: - High Performance Network Operating System Ver. 4.11	For network management
Novell IntraNetware 4.11: - High Performance Network Operating System Ver. 4.11	For network management
SCO Open Server R5.02: - SCO Open Server Operating System R5.02	For multiple-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

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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

MAGNETIC PERIPHERALS

MODEL	TYPE	INT.	CAP.	SIZE	PDG NAME
Y-E Data YD-702D-6537D-624902 Panasonic JU-257A-746P	MFD	SA450	1.44 MB	3.5"	Under BU
Hewlett Packard HP C1536A Sony SDT-4000 (with mechanical adapter for 5.25" bays)	DAT	SCSI	2/8 GB	3.5"	DAT 4000DDS
Sony SDT-7000 (with mechanical 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 ST32151N IBM DORS-32160 IBM DCAS-32160	Narrow HDU	SCSI	2.1 GB	3.5"x1"	HDS 2100-9A
IBM DCAS-34330	Narrow HDU	SCSI	4 GB	3.5"x1"	HDS 4200-54N

Note: *The HDUs are all powered during system power on and, to reduce power absorption, the delay with which the single drive motors are enabled is given by the BIOS with a SCSI command provided by the SCSI controller. For this to be possible the HDUs installed must have their Start Motor Option enabled by means of the appropriate jumper, so that the drive motor starts upon reception of a SCSI command.*

ELECTRONIC BOARDS

BOARD NAME	DESCRIPTION	BUS	PDG NAME
BA2322 BA2324/2337	Monoprocessor motherboard for the SNX 160/N and equipped with a 133/66 MHz Pentium 133 or 166/66 MHz Pentium 166 installed in Socket 7, six sockets for ECC SIMMs to provide a system memory ranging from 16 MB to 192 MB, 128 KB flash EEPROM, 256 KB of second level, write-back, synchronous pipeline burst cache, seven expansion slots for optional boards, AHA2940 SCSI controller, ATI-264VT Super VGA video controller with a 1 MB video memory (expandable to 2 MB), floppy disk controller, two serial ports, parallel port, keyboard and mouse management.	-	Under BU
	Pentium 166 processor with an active heatsink to convert an SNX 160/N 133 into an SNX 160/N 166	-	APU 166 PENT-N
	512 KB - 11-bit TAG second level cache module which replaces the 256 KB onboard module	-	CACHE 512L2
	1 MB video RAM expansion	-	VGA-MEM/10
IN2061	Riser bus expansion board for ISA and PCI boards	-	Under BU
AHA-2940	SCSI Narrow controller present in every configuration	PCI	Under BU
AHA-2940	Kit for duplexing configurations or for the connection of external SCSI peripherals. The kit includes a SCSI Narrow controller and one SCSI cable to use for duplexing. External SCSI cable CBL 5365 is needed for the connection of external peripherals	PCI	DUP KIT160N
GO2175 (Stallion)	32-channel RS232D multiport board	ISA	C-MUX 8-32I
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	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

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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 SUPPLY AND SPS

POWER SUPPLY	OUTPUT VOLTAGES	TOLERANCE	MAX CURR	TOT. POW.	INPUT VOLTAGE	FREQ.
ASTEC VL 202-3425-200	+5 V +12 V -12 V -5 V +5 AUX	+5% -5% +5% -5% +10% -10% +10% -10% +10% -10%	20 A 4.4 A 0.5 A 0.3 A 0.05 A	200 W	90-132 Vac 180-264 Vac	50/60 Hz

Note: The power supply does not have an ON/OFF switch. It is powered on or off by means of the +5 VAUX signal which is output by the auxiliary power supply connector on the system motherboard.

UPS	TOT. POW.	VER.	INPUT VOLTAGE	OUTPUT VOLTAGE	CAB.
APC - SMART UPS 1000 VA	670 W	100/120 Vac 220/240 Vac	100/120 Vac 50/60 Hz 220/240 Vac 50/60 Hz	100/115 Vac 50/60 Hz 225/240 Vac 50/60 Hz	External

Note: The batteries on this UPS can be replaced without removing power from the load.

EXTERNAL 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

INTERRUPT	SYSTEM RESOURCE
NMI	I/O Channel Check
IRQ0	Reserved - Interval Timer
IRQ1	Reserved - Keyboard buffer full
IRQ2	Reserved - Cascade interrupt deriving from the slave PIC
IRQ3	Serial port 2 (COM2)
IRQ4	Serial port 1 (COM1)
IRQ5	Free
IRQ6	Floppy
IRQ7	Parallel port 1 (LPT1)
IRQ8	Real Time Clock
IRQ9	Free
IRQ10	Free
IRQ11	Free
IRQ12	Onboard mouse port
IRQ13	Reserved - Math coprocessor
IRQ14	Primary IDE controller
IRQ15	Secondary IDE controller

SYSTEM MEMORY MAP

ADDRESS RANGE (DECIMAL)	ADDRESS RANGE (HEXADECIMAL)	SIZE	DESCRIPTION
1024K-512M	100000-20000000	511 MB	Extended memory
960K-1023K	F0000-FFFFF	64 KB	AMI system BIOS
944K-959K	EC000-EFFFF	16 KB	Main BIOS recovery code
936K-943K	EA000-EBFFF	8 KB	ESCD (Plug & Play configuration area)
928-935K	E8000-E9FFF	8 KB	OEM logo (available as UMB)
896K-927K	E0000-E7FFF	32 KB	Reserved for the BIOS (currently available as UMB)
800-895K	C8000-DFFFF	96 KB	Free DOS high memory (open for the ISA and PCI buses)
640K-799K	A0000-C7FFF	160 KB	<i>Off-board</i> memory and video BIOS
639K	9FC00-9FFFF	1 KB	Extended BIOS data memory (transferrable from QEMM, 386MAX)
512K-638K	80000-9FBFF	127 KB	Conventional extended memory
0K-511K	00000-7FFFF	512 KB	Conventional memory

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I/O ADDRESS MAP

I/O PORT (h)	SIZE	DEVICE OR FUNCTION
000 - 00F	16 bytes	PIIX - DMA controller 1
020 - 021	2 bytes	PIIX - Interrupt controller
02E - 02F	2 bytes	Ultra I/O configuration
040 - 043	4 bytes	PIIX - System Timer 1
048 - 04B	4 bytes	PIIX - System Timer 2
060	1 byte	Keyboard controller
061	1 byte	PIIX - NMI controller, speaker controller
064	1 byte	Keyboard controller
070 bit 7	1 bit	PIIX - NMI enable
070 bit 6-0	7 bits	PIIX - Clock-calendar
071	1 byte	PIIX - Clock-calendar
080 - 08F	16 bytes	PIIX - DMA page registers
0A0 - 0A1	2 bytes	PIIX - Interrupt controller
0C0 - 0DE	31 bytes	PIIX - DMA controller 2
0F0	1 byte	RESET for numeric errors
170 - 177	8 bytes	Secondary IDE channel
1F0 - 1F7	8 bytes	Primary IDE channel
278 - 27B	4 bytes	Secondary LPT2 parallel port
2F8 - 2FF	8 bytes	Onboard COM2 serial port
376	1 byte	Secondary IDE channel command port
377	1 byte	Secondary IDE channel status port
378 - 37F	8 bytes	Primary LPT1 parallel port
3BC - 3BF	4 bytes	Alternative LPT3 parallel port
3E8 - 3EF	8 bytes	Alternative COM3 serial port
3F0 - 3F5	6 bytes	Floppy disk controller
3F6	1 byte	Primary IDE channel command port
3F7 (solo scrittura)	1 byte	Floppy disk controller
3F7 bit 7	1 bit	Floppy disk controller
3F7 bit 6-0	7 bits	Primary IDE channel status port
3F8 - 3FF	8 bytes	Primary COM1 serial port
LPT + 400h	8 bytes	ECP, LPT port
4D0 - 4D1	2 bytes	Edge/Level
CF8*	4 bytes	PCI configuration
CF9	1 byte	Turbo & Reset
CFC - CFF*	4 bytes	PCI configuration data
FF00 - FF07	8 bytes	Bus Master IDE
FFA0 - FFA7	8 bytes	Primary IDE
FFA8 - FFAF	8 bytes	Secondary IDE

(*): Accessible through DWORD accesses only.

DMA CHANNELS

CHANNEL	DATA WIDTH	SYSTEM RESOURCE
0	8- or 16-bit	Free
1	8- or 16-bit	Free
2	8- or 16-bit	Floppy disk
3	8- or 16-bit	Parallel port (in EPP/ECP configuration)
4		Reserved
5	16-bit	Free
6	16-bit	Free
7	16-bit	Free

POWER ON SYSTEM TEST (POST) MESSAGES

NUMBER BEEPS	FATAL ERROR MESSAGE	DESCRIPTION/SOLUTION
1	Memory refresh has failed	The motherboard circuitry that controls memory refresh is faulty: replace the motherboard.
2	Parity error	A parity error has been detected in the first 64 KB of memory: - Replace the SIMMs - Replace the motherboard.
3	Error in the first 64 KB of memory	An error has been detected in the first 64 KB of memory: - Replace the SIMMs - Replace the motherboard.
4	Faulty motherboard timer	An error has been detected in the first 64 KB of memory or the motherboard timer 1 does not work: replace the motherboard.
5	System processor error	Faulty system processor
6	Keyboard controller error - A20 gate error	The keyboard controller is faulty or the system BIOS is unable to have the processor work in the protected mode: replace the motherboard.
7	System processor error - "Exception Interrupt" was issued	The processor issued an "Exception Interrupt": replace the motherboard.
8	Video memory read/write error	<i>Non-fatal error</i> - The system video controller memory is faulty or is not present: - Make sure that video controller memory is present - If possible, replace the video controller memory - Replace the motherboard.
9	ROM BIOS checksum error	The system BIOS code has been misused or is corrupt: change the BIOS using the specific utility.
10	CMOS shutdown register error	Error in the CMOS shutdown register (read/write): replace the motherboard
1 long + 3 short	Video error	Video controller error.

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DISPLAYED ERROR MESSAGE	DESCRIPTION
8042 GATE - A20 Error	Port A20 of the keyboard controller does not work correctly.
Address line short!	Error in the motherboard address decode circuitry.
Cache memory bad, do not enable cache!	Faulty cache.
CH-2 timer error	Error in motherboard timer 2.
CMOS battery state low	CMOS power supply battery low.
CMOS checksum failure	Each time the system configuration parameters, defined by means of the configuration utilities, are store in CMOS, the checksum is calculated to detect any error which may have occurred during the storage of the data. This checksum value must coincide with the one previously calculated, otherwise this message is displayed.
CMOS system options not set	The configuration parameters stored in CMOS are corrupt.
CMOS display type mismatch	The type of video stored in CMOS is different than the one detected by the POST routine.
CMOS memory size mismatch	The amount of memory present in the system is different than the size stored in CMOS.

DISPLAYED ERROR MESSAGE	DESCRIPTION
CMOS time and date not set	The system date and time have not been defined.
Diskette boot failure	The floppy disk bootstrap sector is damaged or is missing.
Display switch not proper	The jumper on the motherboard that defines the type of video is not set correctly.
DMA BUS time-out	A peripheral drove the DMA signal on the bus for more than 7.8 seconds.
DMA Error	DMA controller error.
DMA #1 Error	Error in the first DMA channel.
DMA #2 Error	Error in the second DMA channel.
FDD controller Failure	The floppy disk controller does not work correctly or the cables are not connected to the floppy disk drive.
HDD controller failure	The hard disk controller does not work correctly or the hard disk cables are not properly connected.
I/O card parity error at XXXX	Problems with a system expansion board. If the address of the board at which the error occurred can be determined, hex xxxx address will be displayed. If the location cannot be determined, the following message is displayed: <i>I/O card parity error ?????</i>
INTR #1 error	Interrupt channel 1 has failed the POST.
INTR #2 error	Interrupt channel 2 has failed the POST.
Invalid boot diskette	The diskette in drive A does not contain the operating system.
Keyboard is locked... Unlock it	A keyboard password has been entered.
Keyboard error	Keyboard error. a way to solve this problem is to remove the keyboard test during the POST by means of the configuration utility.
KB/Interface error	A problem has been with the connection of the keyboard or with the keyboard connector.
Memory parity error at XXXX	Problems with system memory. If the memory address at which the error occurred can be determined, hex xxxx address will be displayed. If the location cannot be determined, the following message is displayed: <i>Memory parity error ?????</i>
Off Board parity error Addr (HEX) = (xxxx)	An error has been detected in the memory of a board connected to the expansion bus. xxxx is the hex address where the error has been detected.
Parity error ?????	System memory error at an unknown address.

SYSTEM CONFIGURATION UTILITY

The following utilities are needed to configure the system:

- The Setup utility, activated directly from the keyboard, allows to change the main configuration parameters of the system
- ICU Ver. 1.45 (ISA Configuration Utility), to be unloaded onto floppy disk from the Orchestra CD-ROM provided in the system Starter Kit, allows the configuration of the hardware devices installed on the system.

ORCHESTRA CD-ROM

The system Starter Kit consists of the following disks:

- **Orchestra Boot Floppy.** 3.5" 1.44 MB disk used to boot the system, access the contents of the Orchestra CD-ROM and load some drivers. It is also used to store the system configuration files.
- **Diagnostics diskette.** 3.5" 1.44 MB diskette containing a set of low level tests to be run on the hardware modules in the system (Customer Test). For more extensive tests the field engineer can use the System Test diskette which differs from the diagnostics diskette provided in the kit as it includes certain destructive tests that could be dangerous to use at user level.
- **Orchestra CD-ROM.** CD-ROM containing the Orchestra interface through which it is possible to run certain utilities and to generate the diskettes containing the drivers and the programs to use for the installation and configuration of the operating system. This CD-ROM also allows the installation of the **Server View** software that provides, within a local area network, an intelligent monitoring and signalling system so that a visual check on the network servers can be made from a Windows workstation.

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Among the diskettes that can be generated from the Orchestra CD-ROM there are two containing the ICU and the library of ISA configuration files (including the *.CFG files for the different expansion boards that can be added to the system and that are not present in the directory of the configurator).

Proceed as follows to unload the ICU diskettes:

- Insert the Orchestra CD-ROM into the CD-ROM drive.
- Select "Create User Diskette" from the "Configuration" menu.
- Copy the ICU onto two floppy disks.

To activate the utility, insert the first diskette that has been generated and reset the system.

ORCHESTRA CD-ROM EVOLUTION

REL.	REASON FOR CHANGE
1.07	New Orchestra CD-ROM and Orchestra Boot Floppy for the SNX 160/N. This CD-ROM has the following main programs: <ul style="list-style-type: none"> - ISA Configuration Utility ver. 1.45 - Video driver (ATI-264VT) - AHA 2940 SCSI driver - Server View - Power Chute UPS driver - Power Net UPS driver - ZNYX driver for the ZX312 LAN controller.

EVD EVOLUTION

GRAPHICAL CHIPSET	LEVEL	REASON FOR CHANGE
EVD ATI-264VT	Ver. 2.04	Video driver for: Windows 3.1x, Windows NT 3.5 and 3.51, Windows 95, OS/2 Warp (partial)
	Ver. 2.05	Updates the drivers of the different operating systems to correct malfunctions.
	Ver. 3.00	Updates the drivers of the different operating systems and provides the new ATI VIDEO PLAYER application for MPEG playback under Windows 95 and Windows 3.1x.
	Ver. 3.01	Solves some of the malfunctions of the OS/2 operating system.
	Ver. 3.02	Updates the drivers for the management of the ATI-264VT Step A4 component.

JUMPERS

Jumpers J4L1C and J4L1D - CPU and System Bus Clock

CPU FREQ. (MHz)	HOST BUS FREQ. (MHz)	JUMPER BLOCK J4L1C: HOST BUS FREQ.		HOST BUS CLOCK AND CPU CLOCK RATIO (CLK RATIO)	JUMPER BLOCK J4L1D: CLK RATIO		PCI BUS FREQ. (MHz)
		PINs 1 - 3	PINs 4 - 6		PINs 1 - 3	PINs 4 - 6	
200	66	1-2	5-6	3	1-2	5-6	33
166	66	1-2	5-6	5/2	2-3	5-6	33
150	60	2-3	4-5	5/2	2-3	5-6	30
133	66	1-2	5-6	2	2-3	4-5	33
120	60	2-3	4-5	2	2-3	4-5	30
100	66	1-2	5-6	3/2	1-2	4-5	33
90	60	2-3	4-5	3/2	1-2	4-5	30
75	50	2-3	5-6	3/2	1-2	4-5	25
Reserved	-	1-2	4-5	-	X	X	-

Jumper J4L1A (Pins 1, 2, 3) - System Password Clear

Position 1-2 Normal operation (Default)
 Position 2-3 Clears the system password.

Jumper J4L1A (Pins 4, 5, 6) - CMOS RAM Reset

Position 4-5 Normal operation (Default)
 Position 5-6 Resets the CMOS RAM.

Jumper J4L1B (Pins 1, 2, 3) - Setup Utility Enable/Disable

Position 1-2 Enables access to the Setup Utility (Default)
 Position 2-3 Disables access to the Setup Utility.

Jumper J6C2 (Pins 1, 2, 3) - System BIOS Recovery

Position 1-2 Normal operation (Default)
 Position 2-3 Enables the BIOS recovery procedure.

Jumper J6C2 (Pins 4, 5, 6) - Processor Power Supply Voltage

Position 4-5 3.3 V
 Position 5-6 3.6 V

Jumper J4G1 - Number of PCI Slots on the Riser Bus Handled by the System

The setting of this jumper, made at the factory, ***must not be changed.***

Positions 1-2 and 4-5 The system handles 2 riser bus PCI slots
 Positions 2-3 and 5-6 The system handles 3 riser bus PCI slots (Default).

MICROPROCESSOR

The motherboard can use the following processors:

- 133/66 MHz Pentium 133
- 166/66 MHz Pentium 166

The processor is installed in 321-pin Socket 7 and can be optionally replaced by the Intel OverDrive processor supported in Socket 5. This processor has the following characteristics:

- Compatible with the previous 8086, 80286, 80386 and 80486 CPUs
- Burst mode support for the read and write cycles
- Integrates a 16 KB cache which is divided into 8 KB for instructions (write-through) and 8 KB for data (write-back)
- Integrates a math coprocessor for floating point operations
- Power supply: 3.3 V(\pm 5%) provided by the voltage regulator on the motherboard.

VIDEO CONTROLLER

The onboard video controller is an ATI-264VT component implemented on the PCI bus. Video memory has a 1 MB capacity expandible to 2 MB. The supported video modes are VGA-compatible and have the following resolutions:

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RESOLUTION	1 MB SGRAM	2 MB SGRAM	VESA - VERTICAL REFRESH RATE	MAXIMUM VERTICAL REFRESH RATE
640x480x4bpp	X	X	60/72/75 Hz	120 Hz
640x480x8bpp	X	X	60/72/75 Hz	120 Hz
640x480x16bpp	X	X	60/72/75 Hz	120 Hz
640x480x24bpp	X	X	60/72/75 Hz	90 Hz
640x480x32bpp		X	60/72/75 Hz	75 Hz
800x600x4bpp	X	X	56/60/72/75 Hz	60 Hz
800x600x8bpp	X	X	56/60/72/75 Hz	100 Hz
800x600x16bpp	X	X	56/60/72/75 Hz	75 Hz
800x600x24bpp		X	60 Hz	60 Hz
1024x768x4bpp	X	X	87interlaced/60/70/75 Hz	100 Hz
1024x768x8bpp	X		87interlaced/60/70/75 Hz	75 Hz
1024x768x8bpp		X	87interlaced/60/70/75 Hz	100 Hz
1024x768x16bpp		X	87interlaced/60/70/75 Hz	75 Hz
1280x768x24bpp		X	87interlaced/60 Hz	60 Hz
1280x1024x8bpp		X	87interlaced/60/75 Hz	75 Hz

SYSTEM MEMORY

The motherboard has six 72-pin sockets for the installation of memory SIMMs. The memory controller of the chipset is programmed to support 36-bit, ECC fast page mode SIMMs with parity checking.

The BIOS automatically recognizes the change in system memory at power on. There are no hardware jumper settings to be made.

The rules to follow when configuring system memory are the following:

- The memory banks must be filled with the same type of SIMMs.
- The two sockets of a memory bank must both be filled by SIMMs of the same capacity.
- The system supports any combination of *filled* banks: only bank 0, only bank 1, only bank 2, bank 0 and bank 1, etc.
- *Tin lead* expansion SIMMs must be used.

The following SIMMs are to be used:

PDG NAME	CAP	MEMORY EXPANSION KIT
EXM 53-016	16 MB	Two 8 MB single sided, 60 ns (2 MB x 36) SIMMs
EXM 53-032	32 MB	Two 16 MB double sided, 60 ns (4 MB x 36) SIMMs
EXM 53-064	64 MB	Two 32 MB single sided, 60 ns (8 MB x 36) SIMMs

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

BANK 0	BANK 1	BANK 2	TOTAL MEMORY
Two 4 MB SIMMs			8 MB
Two 4 MB SIMMs	Two 4 MB SIMMs		16 MB
Two 8 MB SIMMs			16 MB
Two 4 MB SIMMs	Two 8 MB SIMMs		24 MB
Two 4 MB SIMMs	Two 4 MB SIMMs	Two 4 MB SIMMs	24 MB
Two 8 MB SIMMs	Two 4 MB SIMMs	Two 4 MB SIMMs	32 MB
Two 16 MB SIMMs			32 MB
Two 4 MB SIMMs	Two 16 MB SIMMs		40 MB
Two 8 MB SIMMs	Two 8 MB SIMMs	Two 4 MB SIMMs	40 MB
Two 8 MB SIMMs	Two 8 MB SIMMs	Two 8 MB SIMMs	48 MB
Two 16 MB SIMMs	Two 8 MB SIMMs		48 MB
Two 16 MB SIMMs	Two 4 MB SIMMs	Two 4 MB SIMMs	48 MB
Two 16 MB SIMMs	Two 8 MB SIMMs	Two 4 MB SIMMs	56 MB
Two 32 MB SIMMs			64 MB
Two 16 MB SIMMs	Two 16 MB SIMMs		64 MB
Two 16 MB SIMMs	Two 8 MB SIMMs	Two 8 MB SIMMs	64 MB
Two 4 MB SIMMs	Two 32 MB SIMMs		72 MB
Two 16 MB SIMMs	Two 16 MB SIMMs	Two 4 MB SIMMs	72 MB
Two 6 MB SIMMs	Two 16 MB SIMMs	Two 8 MB SIMMs	80 MB
Two 32 MB SIMMs	Two 8 MB SIMMs		80 MB
Two 32 MB SIMMs	Two 4 MB SIMMs	Two 4 MB SIMMs	80 MB
Two 32 MB SIMMs	Two 8 MB SIMMs	Two 4 MB SIMMs	88 MB
Two 32 MB SIMMs	Two 16 MB SIMMs		96 MB
Two 32 MB SIMMs	Two 8 MB SIMMs	Two 8 MB SIMMs	96 MB
Two 16 MB SIMMs	Two 16 MB SIMMs	Two 16 MB SIMMs	96 MB
Two 32 MB SIMMs	Two 16 MB SIMMs	Two 4 MB SIMMs	104 MB
Two 32 MB SIMMs	Two 16 MB SIMMs	Two 8 MB SIMMs	112 MB
Two 32 MB SIMMs	Two 32 MB SIMMs		128 MB
Two 32 MB SIMMs	Two 32 MB SIMMs	Two 4 MB SIMMs	136 MB
Two 32 MB SIMMs	Two 32 MB SIMMs	Two 8 MB SIMMs	144 MB
Two 32 MB SIMMs	Two 32 MB SIMMs	Two 16 MB SIMMs	160 MB
Two 32 MB SIMMs	Two 32 MB SIMMs	Two 32 MB SIMMs	192 MB

BOARD BA2322, line "305", EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
11/96	02AG	212843 T	New board for the SNX 160/N with a second level cache provided by the optional COAST module installed in the CELP socket. The first BIOS release is 1.00.05.CV2 Y lev. Nasc. The BIOS evolutions are described further on.	Factory

BOARDS BA2324 AND BA2337, line "325", EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
1/97	Nasc	214898 V	New boards that replace the BA2322. The BA2324 is manufactured in Marcanise, the BA2337 by Intel. These boards are equipped with the ATI-264VT Step A4 video controller and the 82439HX Step A3 memory controller. The first BIOS release is 1.00.10.CV2 lev. Nasc, code 214758 P. The BIOS evolutions are described further on. Note: The presence of video controller Step A4 on the board requires the installation of video drivers Ver. 3.02.	Factory

Note: Boards BA2322, BA2324 and BA2337 are perfectly interchangeable on the same system.

BIOS EVOLUTION FOR THE BA2322

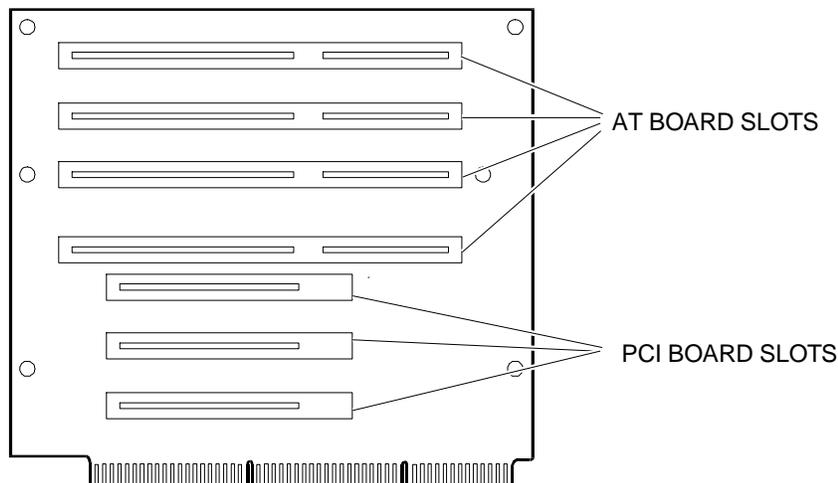
DATE	LEV.	BIOS	CODE	REASON FOR CHANGE
11/96	Nasc	1.00.05.CV2 Y		CUSTOM type BIOS for the systems equipped with the ATI-264VT Step A4 video controller and the 82439HX Step A3 memory controller. This BIOS can be installed on any type of board, however at the factory it is only used on board BA2322. This BIOS includes the new "Event Logging Configuration" section of Setup parameters which must be disabled by setting the "Log Control" parameter to Disabled.

BIOS EVOLUTION FOR THE BA2324 AND BA2337

DATE	LEV.	BIOS	CODE	REASON FOR CHANGE
2/97	Nasc	1.00.10.CV2	214758 P	STANDARD type BIOS used at the factory on the systems equipped with the BA2324 or BA2337 boards. It solves some of the malfunctions and handles bootstrapping from CD-ROM. In the field this BIOS can also be used with the BA2322.

Note: *The BIOS update procedure depends on the BIOS version, CUSTOM or STANDARD, on the system and the type of BIOS to be installed.*

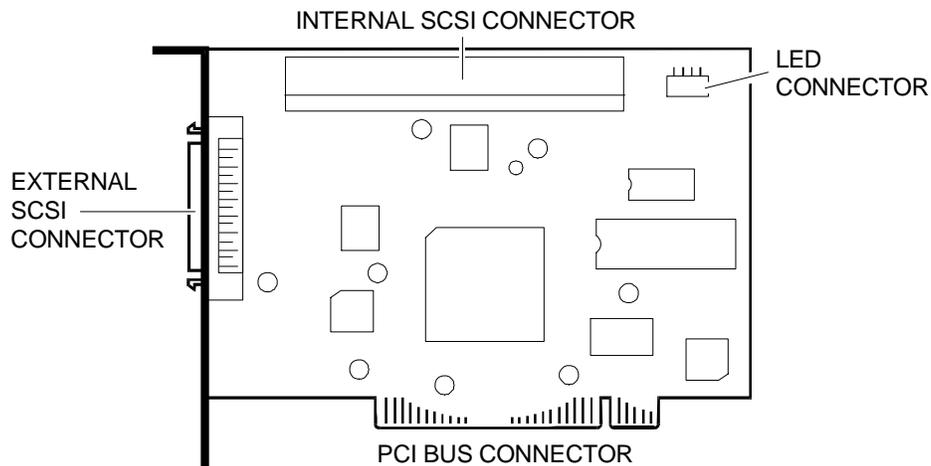
RISER BUS EXPANSION BOARD IN2061



SCSI CONTROLLER BOARD AHA 2940

The SCSI controller board can be used on these system for the management of up to five SCSI peripherals (HDU, DAT and CD-ROM).

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Hard disk duplexing is possible when using two AHA 2940 boards. Disk duplexing consists of copying the contents of one hard disk into another in order to prevent the loss of data in case of hard disk drive failures.

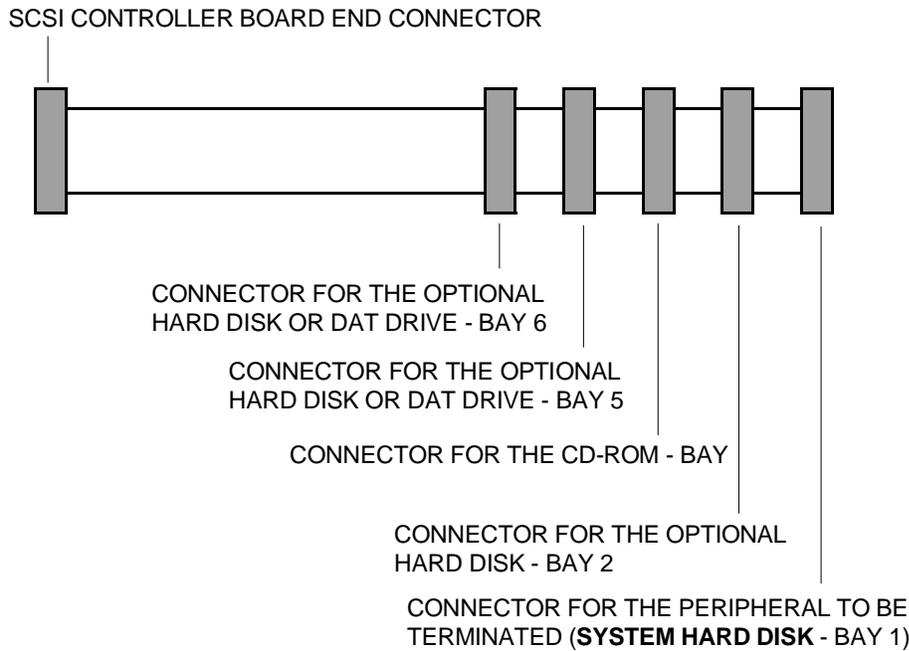
The hard disks that can be used for duplexing must be of the same type and capacity, and must be appropriately configured and connected to their SCSI controllers.

Duplexing must be set via software on the server's operating system.

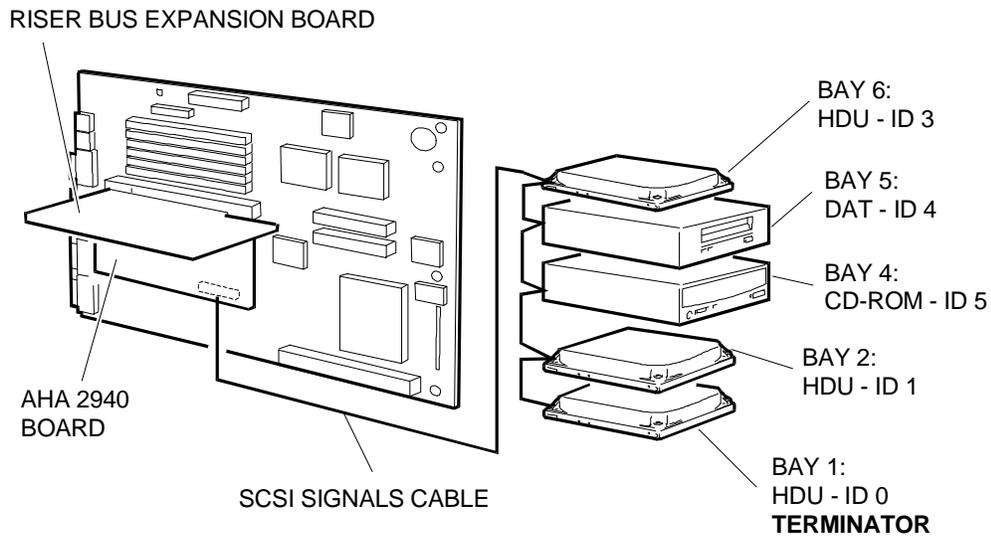
Following is a description of the use of the SCSI controller for the simple connection of peripherals and for connections in hard disk duplexing configurations.

SIMPLE CONNECTION

The following figure shows the SCSI signals cable used for a simple connection:

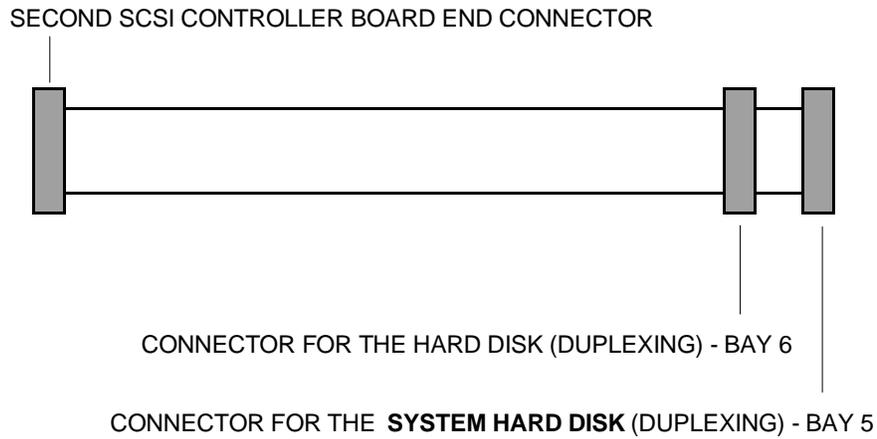


The following figure shows the simple connection of a SCSI controller to peripherals:



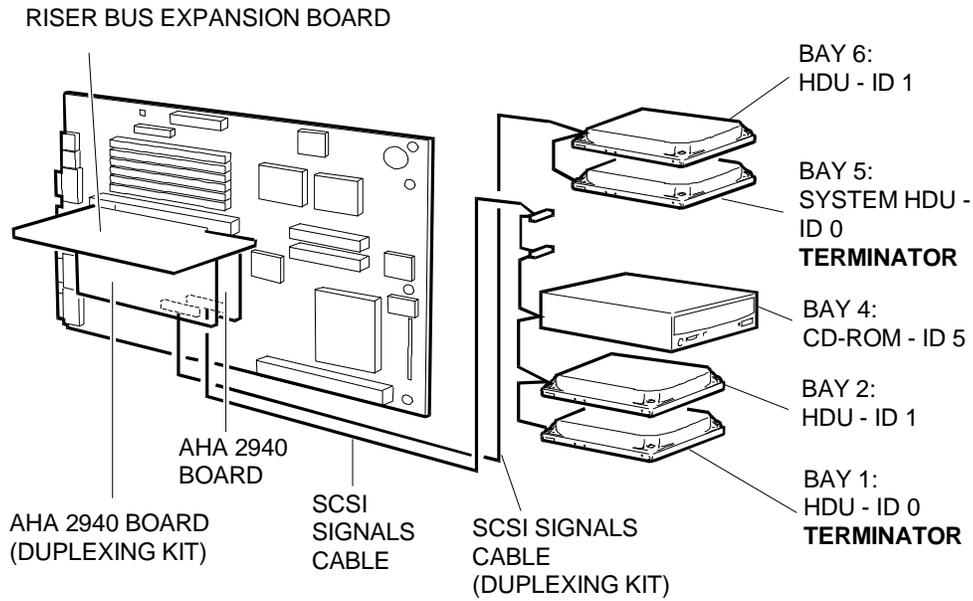
DUPLEXING CONNECTION

The following figure shows the SCSI signals cable used for a duplexing connection:



The following figure shows the connection of the two SCSI controllers used for the duplexing of hard disks:

10



Note: In the duplexing configuration, the system hard disk (BOOT) must be the one connected to the second SCSI controller board installed in Riser bus slot 5 or 6.

AHA 2940 BOARD SOFTWARE CONFIGURATION

To access the SCSI controller configuration program, press the CTRL and A keys at the same time immediately after the execution of the system power on diagnostics. The following table lists the possible configuration parameters.

PARAMETER	MEANING
Host Adapter SCSI ID	Determines the board SCSI ID. The default value is 7 which must not be changed.
SCSI Parity Checking	Enables/disables SCSI parity checking. The default value is Enabled.
Host Adapter SCSI Termination	Enables/disables the terminators on the board. If there is only one SCSI drive connected to the controller board, the terminators must be enabled. If SCSI drives are also connected to the controller board's external connector, the drives at the end of the chain of peripherals will have to be terminated. Note: <i>If external SCSI peripherals are connected to the same AHA 2940 board that handles the internal SCSI hard disks, the "Maximum Sync Transfer Rate" configuration parameter must be set to 5 MB/sec.</i>
SCSI Device Configuration	Among the options available bear in mind that the "Send Start Unit SCSI Command" option must always be set to YES.
Advanced Configuration Options Reset SCSI Bus at Power-On Host Adapter BIOS <Configuration Utility Reserves BIOS Space> Extended BIOS Translation for DOS Drivers > 1 GByte	Among the options available bear the following in mind: Enabled by default, must not be changed. When enabled, all the features offered by the SCSI controller board can be used. Note: <i>Pln order to be able to boot from a non-SCSI peripheral or in the presence of a second SCSI controller board (duplexing), the BIOS must be disabled by setting this option to Disabled.</i> Must always be enabled.

NOTES AND LIMITATIONS

- The SCSI drivers that are contained on the diskette provided in the system Starter Kit must not be used if the Windows NT operating system is installed, since the SCSI drivers provided by this operating system must be used.
- If the motherboard is replaced it is important to bear in mind that the system identification parameters (such as the serial number and system name) stored in the EEPROM will be lost. These parameters, required by the system monitoring applications (for example Intel Landesk Client Manager) must be restored in order to continue to be able to identify the system. The **SYSID** Utility explained in Appendix M can be used to restore these parameters.