SNX 140/S / 160/S SYSTEMA (EAGLE-2)

CHARACTERISTICS

Microprocessor	**SNX 140/S:** 100/66 MHz Intel PENTIUM 100 or 133/66 MHz Intel PENTIUM 133 or Intel PENTIUM 166 a 166/66 MHz **SNX 160/S:** 133/66 MHz Intel PENTIUM 133 or 166/66 MHz Intel PENTIUM 166
Dualprocessor (SNX 160/S only)	Possibility of adding a second optional processor, identical to the first, on the motherboard. This second processor is installed in a ZIF socket adjacent to the one in which the first processor is installed, thus creating a dualprocessor system.
OverDrive Processor	Possibility of replacing the primary processor, installed in a ZIF socket, with future OverDrive processors. In this case the system remains a monoprocessor system.
Chipset	Intel Triton II
Dual bus architecture	32-bit EISA (Extended Industry Standard Architecture) 32-bit PCI (Peripheral Component Interconnect)
Expansion slots	5 slots: 2 EISA/ISA, 2 PCI, 1 shared EISA/PCI
Cache size	**SNX 140/S:** 16 KB integrated in the processor + 256 KB write back - no parity - burst syncronous second level cache, present in every configuration **SNX 160/S:** 16 KB integrated in the processor + 512 KB write back - no parity - burst syncronous second level cache, present in every configuration
RAM	16-256 MB provided by ECC SIMMs
Cabinet	CED box
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.
Ventilation system	The system is adequately cooled down by the power supply fan which faces the motherboard
SVGA video controller embedded on the motherboard	**SNX 140/S:** TGUI9440 connected to the PCI bus, with a 512 KB video memory **SNX 160/S:** TGUI9440 connected to the PCI bus, with a 1 MB video memory
SCSI controller embedded on the motherboard	**SNX 140/S:** AIC 7850 Dagger Narrow connected to the PCI bus **SNX 160/S:** AIC 7870 Lance Wide connected to the PCI bus
HDU resilience	Possible only if the system is equipped with a RAID DPT SCSI Wide/Ultra Wide controller connected to an external PEM RS Wide. The specific mechanical structure of the PEM, in association with HDU redundancy (RAID-1 and RAID-5) of the DPT controller, allows the hot swapping of faulty hard disks and the automatic reconstruction of the data on the new drive.
Uninterruptible Power Supply	External, battery-equipped, 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 connected to a UPS.

Note: *The commercial name of the SNX 140/S and 160/S Systema remains unchanged for the 100 MHz, 133 MHz and 166 MHz versions. For simplicity and whenever necessary, this guide distinuishes between the different versions as follows: SNX 140/S 100; SNX 140/S 133; SNX 140/S 166, SNX 160/S 133; SNX 160/S 166.*

SNX 140/S 160/S SYSTEMA BASIC MODULE
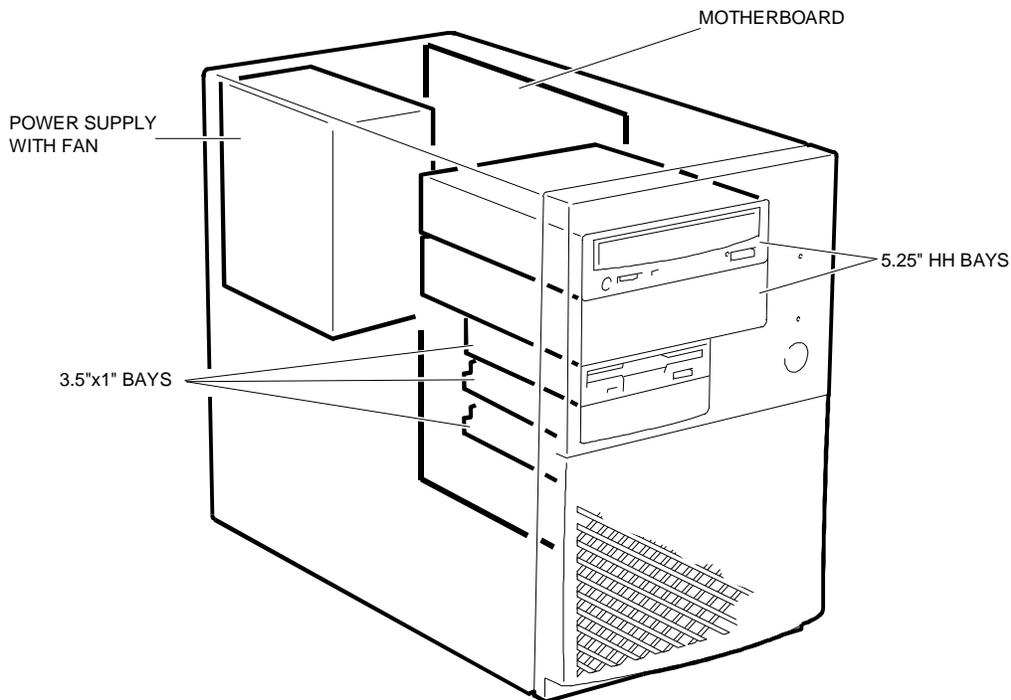
UPDATE LEVELS OF THE MAIN COMPONENTS OF THE FIRST SERIES SNX 140/S 100 MODELS

MOTHERBOARD	BIOS	POWER SUPPLY
BA2289 lev. Nasc	Rev. 1.03	ATX 200-3505-200 lev Nasc
ORCHESTRA 1.1 CD-ROM	**USER DIAGNOSTICS**	**SYSTEM TEST**
Configuration Utility 1.01 Server View 2.0	1.01	1.01

UPDATE LEVELS OF THE MAIN COMPONENTS OF THE FIRST SERIES SNX 140/S 133 MODELS

MOTHERBOARD	BIOS	POWER SUPPLY
BA2289 lev. Nasc	Rev. 1.03	ATX 200-3505-200 lev Nasc
ORCHESTRA 1.1 CD-ROM	**USER DIAGNOSTICS**	**SYSTEM TEST**
Configuration Utility 1.01 Server View 2.0	1.01	1.01

UPDATE LEVELS OF THE MAIN COMPONENTS ON THE FIRST SERIES SNX 140/S 166 MODELS

MOTHERBOARD	BIOS	POWER SUPPLY
BA2299 lev. Nasc	Rev. 1.06	ATX 200-3505-200 lev Nasc
ORCHESTRA 1.1 CD-ROM	**USER DIAGNOSTICS**	**SYSTEM TEST**
Configuration Utility 1.01 upd 1 Server View 2.0	1.03	1.03

UPDATE LEVELS OF THE MAIN COMPONENTS ON THE FIRST SERIES SNX 160/S 133 MODELS

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MOTHERBOARD	BIOS	POWER SUPPLY
BA2255 lev. Nasc	Rev. 1.06	ATX 200-3505-200 lev Nasc
ORCHESTRA 1.1 CD-ROM	**USER DIAGNOSTIC**S	**SYSTEM TEST**
Configuration Utility 1.01 upd 1 Server View 2.0	1.03	1.03

UPDATE LEVELS OF THE MAIN COMPONENTS ON THE FIRST SERIES SNX 160/S 166 MODELS

MOTHERBOARD	BIOS	POWER SUPPLY
BA2255 lev. Nasc	Rev. 1.06	ATX 200-3505-200 lev Nasc
ORCHESTRA 1.1 CD-ROM	**USER DIAGNOSTICS**	**SYSTEM TEST**
Configuration Utility 1.01 upd 1 Server View 2.0	1.03	1.03

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

OPERATING SYSTEMS

OPERATING SYSTEM TESTED WITH PRODUCT RELEASE	DUAL PROCESSOR SUPPORT	NOTES
Windows 95: - MS Windows 95	Yes	For single-user, single-task, graphics environments
Windows NT 3.51: - MS-Windows NT Server Operating System Ver 3.51 - Service pack 3 / Service pack 4	Yes	For network management
NetWare 3.12: - Advanced Network Operating System for Bussines Computing Ver. 3.12	No	For network management
NetWare 4.1: - High Performance Network Operating System Ver. 4.1	No	For network management
NetWare 4.1 SMP: - High Performance Network Operating System Ver. 4.1 - Netware Multiprocessor Support	Yes	For network management. NetWare Multiprocessor Support is contained on the Orchestra CD-ROM
UnixWare 2.03: - UnixWare Application Server Ver 2.01 - UnixWare Application Server Ver 2.03 (update)	Yes	For multiple-user, multiple-task environments
SCO Unix 3.2.4.2: - SCO Unix Operating System Ver 4.2 - SCO Open Server Enterprise System Ver 3.0.0 - SCO-UOD 393C	Yes	For multiple-user, multiple-task environments
SCO Open Server R5.0: - SCO Open Server R5.0 - Supplement Release 5.0.0d	Yes	For multiple-user, multiple-task environments.
OS/2 R2.1 V2.11: - OS/2 R2.1 V2.11 - Patch FIX PACK98 - Lan Server R4.0	No	For single-user, multiple-task environments
OS/2 R2.1 V2.11 SMP Fixpack: - OS/2 R2.1 V2.11 SMP Fixpack - Patch FIX PACK98 - Lan Server R4.0 - OS/2 2.11 PSD	Yes	For single-user, multiple-task environments. OS/2 2.11 PSD is contained on the Orchestra CD-ROM
OS/2 R3.0 (Warp): - OS/2 R3.0 (Warp or Warp Connect)	Yes	For single-user, multiple-task environments

MONITORS

MODEL	DESCRIPTION	SUPPLIER	PDG NAME
MDU 1441	14" VGA flat screen monochrome monitor (North America, Canada and Northern European version, 110 V). Label: DSM 25-314/P-Y	Philips	DSM 25-314/P-Y
MDU 1441/LE	14" VGA low emission positive monochrome monitor. Label: MDU 1441E/PH01	Philips	DSM 26-314/LE
CDU 1448G/LO	14", VGA Plus, SVGA, 0.28 dp, MPR II/PS color monitor	Lite-On	DSM 50-148
CDU 1448G/HY	14", VGA Plus, SVGA, 0.28 dp, MPR II/PS color monitor	Hyundai	DSM 50-149
CDU 1460/MS	14", VGA Plus, SVGA, 0.28 dp, MPR II/PS/DDC1, 64 KHz, Multifunct. color monitor	Hyundai	DSM 50-144
CDU 1564/MS	15", flat screen, VGA Plus, SVGA, 0.28 dp, MPR II/O.S., FTS, Multisync. color monitor	Hyundai	DSM 50-151
CDU 1786/D	17", flat screen, VGA Plus, SVGA, 0.25 dp, MPR II/PS/DDC1, 82 KHz Diamond, Tron Tub. color monitor	Mitsubishi	DSM 50-175
CDU 1448/MS	14" VGA Plus; SVGA, 0.28 dot pitch, MPR II/PS/DDC, 48 KHz, Multifunct. color monitor	Lite-On	DSM 60-400
CDU 1564/OD	15" flat screen, VGA Plus, SVGA, 0.28 dot pitch, MPR II/DCC1, 28/64 KHz	Goldstar	DSM 60-510

TABLE OF EVDs FOR THE TRIDENT 9440 GRAPHICS CHIPSET

O.S.	Resolution (pixel)	16 col 4 bpp	256 col 8 bpp	65k col 16 bpp	16.7 M 24 bpp
OS/2	640 x 480 800 x 600 1024 x 1024 1280 x 1024 1600 x 1200	N/S *** N/S N/S N/S N/S	0.5/1 0.5/1 1 N/S N/S	1 1 N/S N/S N/S	1 N/S N/S N/S N/S
NT 3.5	640 x 480 800 x 600 1024 x 1024 1280 x 1024 1600 x 1200	N/S *** N/F N/F N/F N/F	0.5/1 0.5/1 ** N/F N/S N/S	1 N/F N/F N/S N/S	N/F N/S N/S N/S N/S
WIN 95	640 x 480 800 x 600 1024 x 1024 1280 x 1024 1600 x 1200	N/S *** N/F N/F N/F N/S	0.5/1 0.5/1 1 N/S N/S	1 1 N/F N/S N/S	N/F N/S N/S N/S N/S

**	Good 60 Hz resolution operation
***	Standard resolution supported by the operating system driver
0.5/1	Supported with 0.5 or 1 MB of video memory (0.5 MB on the SNX 140/S, 1 MB on the SNX 160/S)
N/S	Not supported
N/F	Non operational

MAGNETIC PERIPHERALS

MODEL	TYPE	INT.	CAP.	SIZE	PDG NAME
Y-E Data YD-702D-6537D Sony MPF520-3 Mitsumi D359T5 Epson SMD 1340 P-031	MFD	SA450	1.44 MB	3.5"	Under BU
Wangtek 51000HT Tandberg TDC4120 (standard front panel)	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 mechanical adapter for 5.25" bays)	DAT	SCSI	4/16 GB	3.5"	DAT 8000DDS2
Sony CDU76S (4X) Panasonic CR-504-J (4X)	CD-ROM	SCSI	650 MB	5.25" HH	CDR 4S-500
Panasonic CR-506-B (8X)	CD-ROM	SCSI	650 MB	5.25" HH	CDR 8S-500
Conner CP30540 Seagate ST3620N Quantum EMPIRE 540	HDU Narrow	SCSI	525 MB	3.5" x 1"	HDS 525-9 (SNX 140/S only)
Seagate ST31230N Seagate ST31200N Digital DSP3107L	HDU Narrow	SCSI	1.05 GB	3.5" x 1"	HDS 1050-9 (SNX 140/S only)
IBM DPES-31080 Seagate ST51080N	HDU Narrow	SCSI	1.05 GB	3.5" x 1" 3.5x0.75"	HDS 1050-9A (SNX 140/S only)
Seagate ST32430N Seagate ST32151N IBM DORS-32160 IBM DCAS-32160	HDU Narrow	SCSI	2.1 GB	3.5"x1"	HDS 2100-9 (SNX 140/S only)
Seagate ST31230WC (with 80-pin SCA to 68-pin standard SCSI adapter)	HDU Wide	SCSI	1.05 GB	3.5" x 1"	HDS 1050-54W
Seagate ST32430WC (with 80-pin SCA to 68-pin standard SCSI adapter)	HDU Wide	SCSI	2.1 GB	3.5" x 1"	HDS 2100-54W
IBM DCAS 34330 (with 80-pin SCA to 68-pin standard SCSI adapter)	HDU Wide	SCSI	4.2 GB	3.5" x 1"	HDS 4G54-68

Note: *The Wide HDUs, suitable for installation in resilience cabinets, have a single 80-pin SCA interface connector which includes the SCSI and power supply signals in addition to the signals for automatic SCSI ID selection. There are no terminators present on these drives. In order to be able to install these drives on non-resilience systems, plug a specific SCSI adapter in the SCA connector. This adapter renders the 68-pin SCSI wide connector, the 4-pin power supply connector, the SCSI ID selection jumpers and the SCSI terminators all accessible to the user. The 68/80-pin SCSI adapter is called IF2047, p.c.b. code 654485 Y, vimo code 210841 B.*

Note: *On the SNX 140/S, the Wide HDUs can only be fitted if connected to the optional SCSI Wide controller SCC PCI 114W by means of internal cable CBL SNX3W.*

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

Note: *Mechanical kit MEC 8000 needs to be ordered to be able to install the third 3.5"x1" HDU into the 5.25" bay.*

Note: *An Ultra Wide controller connected to a Wide HDU only works in the Wide mode.*

ELECTRONIC BOARDS

BOARD NAME	DESCRIPTION	BUS	PDG NAME
BA2289	Monoprocessor motherboard for the SNX 140/S and equipped with a 100/66 MHz Pentium 100, 133/66 MHz Pentium 133 or 166/66 MHz Pentium 166 installed in Socket 5, a VRM header socket for the installation of a shorting block or VRM, eight sockets for system memory ECC SIMMs (from 16 to 256 MB), 256 KB Flash EPROM, 256 KB second level write-back, no parity, burst synchronous cache, six expansion slots for optional boards, Dagger SCSI Narrow controller, Super VGA video controller with a 512 KB video memory, floppy disk controller, two serial ports, parallel port, keyboard and mouse management. This board is installed on the first 90 systems manufactured and has the possibility of hosting the SAR board.	-	Under BU
BA2299	Monoprocessor motherboard for the SNX 140/S and equipped with a 100/66 MHz Pentium 100, 133/66 MHz Pentium 133 or 166/66 MHz Pentium 166 installed in Socket 7, a VRM header socket for the installation of a shorting block or VRM, eight sockets for system memory ECC SIMMs (from 16 to 256 MB), 256 KB Flash EPROM, 256 KB second level write-back, no parity, burst synchronous cache, six expansion slots for optional boards, Dagger SCSI Narrow controller, Super VGA video controller with a 512 KB video memory, floppy disk controller, two serial ports, parallel port, keyboard and mouse management. This board is installed on the first 90 systems manufactured and has the possibility of hosting the SAR board.	-	Under BU
BA2255	Dualprocessor motherboard for the SNX 160/S and equipped with a 133/66 MHz Pentium 133 or 166/66 MHz Pentium 166 installed in Socket 7, a second Socket 7 for the installation of a second optional processor identical to the first, a VRM header socket for the installation of a shorting block or VRM, eight sockets for system memory ECC SIMMs (from 16 to 256 MB), 256 KB Flash EPROM, 512 KB second level write-back, no parity, burst synchronous cache, six expansion slots for optional boards, Lance SCSI Wide controller, Super VGA video controller with a 1 MB video memory, floppy disk controller, two serial ports, parallel port, keyboard and mouse management. This board is installed on the first 90 systems manufactured and has the possibility of hosting the SAR board.	-	Under BU
	Second optional Pentium 133 processor with an active heatsink for the SNX 160/S 133	-	APU 133 PENT-A
	Second optional Pentium 166 processor with an active heatsink and VRM for the SNX 160/S 166	-	APU 166 PENT
GO2124 (Dagger)	Single-ended, single-channel SCSI Narrow controller for the SNX 140/S only. Prerequisites are CBLI SNX-2 for any internal connection, or external SCSI cable CBL 5365 for connection to external peripherals	PCI	SCC PCI 101E
GO2109 (Lance)	Single-ended, single-channel SCSI Wide controller for the SNX 160/S. Prerequisites are CBLI SNXW-3 or CBLI SNX-2 for any internal connection, or external SCSI cable CBL 5365 for connection to external peripherals	PCI	SCC PCI 114W

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BOARD NAME	DESCRIPTION	BUS	PDG NAME
GO2098 (PM3334W) (RAID DPT Wide)	Single-/tri-channel single-ended SCSI Wide 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 connector 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. The controller on these systems is only used for connection to the PEM RS Wide. Prerequisites are the PEM and external SCSI Wide cable CBL 5350W. Only one PEM can be connected to the system and therefore the DPT controller is only needed in dual-channel version and therefore board IF2049 is not used.	PCI	DCR PCI1/3W
IF2048 (SX4030/1W)	Piggy back board providing the second SCSI Wide channel (external only), on the GO2098, internal SCSI Wide cable for connection between the board and SCSI connector flush with the system frame.	-	EXP 2NDSCSIW
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. This controller is only used on th SNX 160/S and when the GO2098 is no longer in stock. It is only used for the connection of the PEM RS Wide and its prerequisites are the PEM and SCSI CBL 5350W. Since the system can only be connected to one PEM, the dual-channel DPT controller can be used and therefore the IF2066 board is not needed.	PCI	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.	-	RACME 04
MEM 2027 (SM4000/4)	One 4 MB ECC SIMM for cache expansion on the RAID DPT 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
GO2057 (Stallion)	32-channel RS232D multiport board. The kit also contains the cable for connection to the DBOX.	EISA	C-MUX8-32E
BOX 800	8-way RS232D distribution box for the Stallion (max 4)	-	DBOX 800
BOX 1600	16-way RS232D distribution box for the Stallion (Max 2)	-	DBOX 1600
(supplier Olicom)	Token Ring 16/4 LAN controller	PCI	OC 3137
(supplier Z'NYX)	Ethernet COMBO (10BaseT + COAX) LAN controller	PCI	ZX312
(supplier 3Com)	Etherlink III, 10Base_T LAN controller	EISA	3C592 TPO
(supplier 3Com)	Etherlink III, 10Base_T + COAX LAN controller	EISA	3C592 COMBO
(supplier 3Com)	Etherlink III, 10Base_T LAN controller	PCI	3C900 TPO
(supplier 3Com)	Etherlink III, 10Base_T + AUI + COAX LAN controller	PCI	3C900 COMBO
(supplier 3Com)	Fast Ethernet 10/100 LAN controller	PCI	3C905 TX

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

POWER SUPPLIES AND UPS

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	+5% +5% +5% +10% +10% +10%	-4% -4% -5% -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	Basic

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.*

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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
APC - SMART UPS 1400 VA	950 W				
APC - SMART UPS 2200 VA	1600 W				
APC - SMART UPS 3000 VA	2250 W				

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.

KEYBOARD AND MOUSE

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

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

SERIAL AND PARALLEL CONNECTION CABLES

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

INTERRUPT LEVELS

LEVEL	STATUS	FUNCTION
NMI	Reserved	Fatal errors: system failure or double RAM error
SMI	Reserved	Power management or ECC error
IRQ0	Reserved	Timer
IRQ1	Reserved	Keyboard
IRQ2	Reserved	Cascade interrupt from the PIC slave
IRQ3		COM2 on the motherboard (edge), if enabled, otherwise free
IRQ4		COM1 on the motherboard (edge), if enabled, otherwise free
IRQ5		LPT2 on the motherboard (edge), if enabled, otherwise free
IRQ6		Floppy controller on the motherboard (edge), if enabled, otherwise free
IRQ7		LPT1 on the motherboard (edge), if enabled, otherwise free
IRQ8	Reserved	Real time clock
IRQ9	Free	Can be used for the onboard SCSI or SVGA controller
IRQ10	Free	
IRQ11	Free	
IRQ12		Mouse on the motherboard (edge), if enabled, otherwise free
IRQ13	Reserved	
IRQ14	Free	
IRQ15	Free	Usually reserved for the SCSI controller

SYSTEM MEMORY MAP

ADDRESS RANGE	SIZE	FUNCTION
00000H to 07FFFH	512 KB	Base memory
80000H to 9FFFFH	128 KB	Base memory enabled in the Setup
0A0000H to 0BFFFFH	128 KB	Video RAM
0C0000H to 0C7FFFH	32 KB	Shadow RAM reserved for the video BIOS
0C8000H to 0CFFFFH	32 KB	Shadow RAM reserved for the SCSI BIOS
0D0000H to 0EFFFFH	128 KB	User memory area
0F0000H to FFFFFH	64 KB	System BIOS
100000H to 14 MB		System memory

I/O ADDRESS MAP

I/O ADDRESS	DEVICE	CHIP
000 - 00F	Slave DMA controller 1	ESC
020 - 021	Master interrupt controller 1	ESC
022 - 023	ESC index and data registers	ESC
040 - 043	Timer 1	ESC
048 - 04B	Timer 2	ESC
60, 64	Keyboard/mouse controller	SIO
61	NMI and diagnostic port	ESC
070 - 071	Real time clock	SIO
080 - 08F	DMA page register	ESC
092	System control port	ESC
0A0 - 0A1	Slave interrupt controller 2	ESC
0C0 - 0DE	Master DMA controller 2	ESC
0F8 - 0FF	Math coprocessor	CPU
278 - 27B	Parallel port 2 (LPT2)	SIO
2E8 - 2EF	Serial port 4 (COM4)	SIO
2F8 - 2FF	Serial port 2 (COM2)	SIO
378 - 37F	Parallel port 1 (LPT1)	SIO
3B0 - 3BB	VGA registers	VGA
3BC - 3BE	Parallel port 3 (LPT3)	SIO
3F0 - 3F5	Floppy disk controller on the motherboard	SIO
3F7	Floppy controller	SIO
3F8 - 3FF	Serial port 1 (COM1)	SIO
400 - 40B	Extended DMA controller 1 registers	ESC
461 - 464	Extended NMI registers and fail safe timer	ESC
464 - 465	Extended bus master	ESC
480 - 48F	Extended DMA page register	ESC
4C2 - 4CE	Extended DMA2 registers	ESC
4D0	Extended interrupt 1	ESC
4D1	Extended interrupt 2	ESC
4D4	Extended DMA2 chaining	ESC
C00	EISA NVRAM page register	ESC
C04 - C08	System board configuration registers	PLD
C20 - C28	Automatic server recovery registers	PLD
C28 - C2F	Hot pluggability registers	PLD
C80 - C83	System board EISA ID register	ESC
C84	System board enable	ESC
CF0 - CFF	PCI mechanism 1 access registers	TXC

DMA CHANNELS

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

POWER ON DIAGNOSTIC MESSAGES

ERROR MESSAGE	DESCRIPTION
SYSTEM BOOTSTRAP ERROR MESSAGES	
Non-System Disk or Disk Error Replace Disk and Strike Any Key	A damaged diskette, or one without the bootable file, has been inserted in drive A at system power on. The diskette must be replaced by a suitable diskette. It may also be that the drive and the diskette are not compatible, that the drive is not set correctly in the ROM Setup utility, check.
No ROM BASIC Available - RESET	There is an error in the system BIOS if the error presists after a reset. Replace the motherboard and rewrite the BIOS flash EPROM.
MEMORY TEST ERROR MESSAGES	
Memory SIMM Mismatch Error in bank(s): xx	System DRAM memory incorrectly inserted into its sockets, or the SIMM sizes are different within the same bank. If necessary, replace the SIMM, activate the diagnostic, otherwise replace the motherboard.
Memory SIMM Read/Write Error	128 KB base memory bank read/write test failed. Replace the SIMM modules, then the motherboard.
Base Memory Configuration Error	The configured base-memory size is different from the actual size. Activate the ROM Setup utility, the error condition will be corrected automatically.
Extended Memory Configuration Error	The configured extended memory size is different from the actual extended memory. Activate the ROM Setup utility, the error condition will be corrected automatically.
Total Memory Configuration error	The total memory size configured is different from the actual total-memory size. Activate the ROM Setup utility, the error condition will be corrected automatically.
Memory Size Miscompare Error	The configured base or extended memory size was different from the actual size found. Activate the ROM Setup utility, the error condition will be corrected automatically.
Address Line Error at Addr: xxxxxxxxh Wrote: xxxxxxxxh Read: xxxxxxxxh	System board DRAM memory-address lines open or shorted. Run the diagnostic, replace the motherboard.
Dword Access Error at Addr: xxxxxxxxh Wrote: xxxxxxxxh Read: xxxxxxxxh	DRAM word enable control lines are open or shorted. Run the diagnostic, replace the motherboard.
Read/Write Error at Addr: xxxxxxxxh Wrote: xxxxxxxxh Read: xxxxxxxxh	DRAM read/write error or EEPROM configuration error. Check the configuration, run the diagnostic, replace the SIMM memory modules, then the motherboard.
System Parity Error at Addr: xxxxxxxxh Wrote: xxxxxxxxh Read: xxxxxxxxh	Parity error in system memory. Check that the SIMM modules are inserted correctly on the motherboard, run the diagnostic, replace the SIMM modules, then the motherboard.
Adapter Parity error in Slot: xx	EISA/ISA board parity error in slot x. Activate the ECU, replace the board, then the motherboard.
Unable To Clear Parity/IOCC Error	Parity error during I/O access (depends on previous error). Run the diagnostic, replace the motherboard.
Unable to Enter Protected Mode	Run the diagnostic, replace the motherboard.
FATAL ERROR, System Halted	Check base memory configuration, activate the ECU.
Remapped Split Memory Config Error Address: Length:	Activate the ECU.
EISA/PCI CONFIGURATION ERROR MESSAGES	
ACFG (Auto Config) Error	Internal self-configuration error. Insufficient system memory or incorrect buffer allocation. Activate the ECU to solve the configuration conflict manually.
Invalid Slot Init Error in slot(s): xx	POD has detected a configuration error in the EEPROM relevant to the board installed in slot x. Activate the ECU.

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ERROR MESSAGE	DESCRIPTION
ID Timeout Error in slot(s): xx	Timeout while reading the EISA ID from the board in slot x. Check the board insertion in the slot, replace the board, then the motherboard.
ID Configuration Error in slot(s): xx	The EEPROM EISA ID for slot x does not match the physical EISA ID. Either a new EISA board has been installed in the slot or an existing board has been removed, check by activating the ECU.
Incomplete Configuration Error in slot(s): xx	The EEPROM configuration for the board in slot x is not complete. Activate the ECU.
Invalid Configuration Error in slot(s): xx	EEPROM configuration error concerning the board installed in slot x. Activate the ECU.
Invalid Memory Configuration Error in slot(s): xx	EEPROM configuration error concerning the board installed in slot x. Activate the ECU.
Invalid IRQ Configuration Error in slot(s): xx	IRQ configuration error in the EEPROM for the board installed in slot x. Activate the ECU.
Invalid DMA Configuration Error in slot(s): xx	DMA configuration error in the EEPROM for the board installed in slot x. Activate the ECU.
Invalid Port Configuration Error in slot(s): xx	I/O port configuration error in the EEPROM forn the board installed in slot x. Activate the ECU.
RAM/ROM Attribute Conflict Error in slot(s): xx	The memory attribute for the board installed in slot x conflicts with the allowable attribute for the memory range. Activate the ECU.
PCI Configuration Error	Error during configuration. Insufficient system memory, or buffer allocation error. Activate the ECU to solve the configuration conflict manually.
Video RAM Attribute Error in slot(s): xx	Video RAM is incorrectly declared in slot x as read-only memory or as cacheable memory (video RAM is read/write and cannot be cached). Activate the ECU.
C000: Seg RAM/ROM Attrib Conflict Error in slot(s): xx	The C000: range is declared as RAM in slot x but the user has configured the C000: range to be shadowed (as ROM). Activate the ECU.
C800: Seg RAM/ROM Attrib Conflict Error in slot(s): xx	The C800: range is declared as RAM in slot x but the user has configured the C800: range to be shadowed (as ROM). Activate the ECU.
D000: Seg RAM/ROM Attrib Conflict Error in slot(s): xx	The D000: range has been declared as RAM in slot x but the user has configured the D000: range to be shadowed (as ROM). Activate the ECU.
D800: Seg RAM/ROM Attrib Conflict Error in slot(s): xx	The D800: range is declared as RAM in slot x but the user has configured the D800: range to be shadowed (as ROM). Activate the ECU.
System Board Configuration Error	Motherboard configuration error. Activate the ECU.
KEYBOARD/MOUSE ERROR MESSAGES	
Keyboard Clock/Data Line Error	Keyboard control signals are open or shorted. Run the diagnostic, check the keyboard connection, then the motherboard.
Keyboard Controller Error	Keyboard controller error. Run the diagnostic, replace the motherboard.
Keyboard Interrupt Error	Keyboard controller interrupt test error. Run the diagnostic, replace the motherboard.
Keyboard Selftest Error	Keyboard selftest failed. Run the diagnostic, replace the keyboard or the motherboard.
Keyboard Stuck Key Code: xxh Error	Keyboard stuck key detected; the stuck key 's scan-code value is displayed in hex format. Run the diagnostic, replace the keyboard or the motherboard.
Keyboard/Pointing Device Fuse Error	Defective keyboard/mouse fuse. Replace it.
Keyboard Controller Communication Error	Keyboard controller did not respond to commands sent. Run the diagnostic, check the keyboard connection, replace the cable, the keyboard, then the motherboard.
Keyboard Controller Selftest Error	Keyboard controller automatic test failed. Run the diagnostic, replace the motherboard.

ERROR MESSAGE	DESCRIPTION
Pointing Device Error	Error during mouse test. Run the diagnostic, replace the mouse, then the motherboard.
COPROCESSOR ERROR MESSAGES	
CPU Math Coprocessor Presence Error	Math coprocessor not detected (it should always be present with the processor). Run the diagnostic, replace the motherboard.
CPU Math Coprocessor Stack Error	Processor internal error. Run the diagnostic, replace the motherboard.
CPU Math Coprocessor Trig Error	Processor internal error. Run the diagnostic, replace the motherboard.
CPU Math Coprocessor Logarithm Error	Processor internal error. Run the diagnostic, replace the motherboard.
CPU Math Coprocessor Exception Erro	Processor internal error. Run the diagnostic, replace the motherboard.
CPU Math Coprocessor Interrupt Error	Processor internal error. Run the diagnostic, replace the motherboard.
CPU Math Coprocessor Config Error	Coprocessor configured as present, but the presence has not been detected or coprocessor configured as not present, but the presence has been detected. Run the ROM Setup utility, then replace the motherboard.
CACHE MEMORY TEST ERROR MESSAGES	
CPU Internal Cache Addr Line Error	Processor internal cache error. Run the diagnostic, replace the motherboard.
CPU Internal Cache Flush Error	Processor internal cache error. Run the diagnostic, replace the motherboard.
CPU Internal Cache INVD Error	Processor internal cache error. Run the diagnostic, replace the motherboard.
CPU Internal Cache WBINVD Error	Processor internal cache error. Run the diagnostic, replace the motherboard.
CPU Internal Cache Read/Write Error	Processor internal cache error. Run the diagnostic, replace the motherboard.
CPU Internal Cache End Bits Error	Processor internal cache error. Run the diagnostic, replace the motherboard.
CPU Internal Cache Consistency Error	Processor internal cache error. Run the diagnostic, replace the motherboard.
CPU Internal Cache Disabled	Displayed together with one of the previous error messages when there is no secondary cache. Run diagnostic, replace the motherboard.
CPU Internal/Optional Caches Disabled	Displayed together with one of the previous error messages there is a secondary cache. Run the diagnostic, replace the motherboard.
Optional Cache Addr Line Error	Secondary cache error. Run the diagnostic, replace the secondary cache, then the motherboard.
Optional Cache Read/Write Error	Secondary cache error. Run diagnostic, replace the secondary cache, then the motherboard.
Optional Cache Replacement Error	Secondary cache error. Run diagnostic, replace the secondary cache, then the motherboard.
Optional Cache Gate A20 Line Error	Secondary cache error. Run the diagnostic, replace the secondary cache, then the motherboard.
Optional Cache Cacheability Error	Secondary cache error. Run diagnostic, replace the secondary cache, then the motherboard.
Optional Cache Shadow RAM Caching	The secondary cache is declared as RAM shadow, therefore only read, to be enabled also for write. Set the parameter correctly with the ROM Setup utility.
Optional Cache Disabled	Displayed together with the six previous error messages. The processor primary cache is still working. Run the diagnostic, replace the secondary cache, then the motherboard.

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ERROR MESSAGE	DESCRIPTION
DMA REGISTER ERROR MESSAGES	
DMA Address Register Error	DMA controller error. Run the diagnostic, replace the motherboard.
DMA Count Register Error	DMA controller error. Run the diagnostic, replace the motherboard.
DMA Mask Register Error	DMA controller error. Run the diagnostic, replace the motherboard.
DMA Page Register Error	DMA controller error. Run the diagnostic, replace the motherboard.
DMA Stop Register Error	DMA controller error. Run the diagnostic, replace the motherboard.
SERIAL PORT, PARALLEL PORT ERROR MESSAGES	
Serial COMx Address Conflict Error	Address conflict between the motherboard serial port and the COMx serial port of the ISA expansion board. Activate the ECU.
Serial COMx Reg Read/Write Test Error	Hardware error on COMx serial port. Run the diagnostic, replace the motherboard.
Serial COMx MODEM Loopback Test Error	Hardware error on COMx serial port. Run the diagnostic, replace the motherboard.
Serial COMx FIFO Buffer Test Error	Hardware error on COMx serial port. Run the diagnostic, replace the motherboard.
Serial COMx Interrupt Test Error	Hardware error on COMx serial port. Run the diagnostic, replace the motherboard.
Serial COMx IRQ Config Error	IRQ configuration error on COMx serial port. Run Setup utility.
Serial Port Error	Serial port configured for remote terminal has failed the test. Run diagnostic, replace the motherboard.
Parallel Port Address Conflict Error	I/O addresses conflict between motherboard parallel port and another installed on ISA board. Activate the ECU.
Parallel Port Compatible Mode Error	Hardware error on parallel port. Run the diagnostic, replace the motherboard.
Parallel Port Extended Mode Error	Hardware error on parallel port. Run the diagnostic, replace the motherboard.
FLOPPY DISK ERROR MESSAGES	
Floppy Disk CMOS Count Config Error	The floppy disk drive number configured in the EEPROM is not the same as the one detected by the POD. Run ROM Setup utility, check FDU signals and power cables.
Floppy Disk CMOS Type Configuration Error	The floppy disk drive number configured in the EEPROM is not the same as the one detected by the POD. Run the ROM Setup utility.
Floppy Disk Controller Config Error	The floppy controller is not configured correctly. Run ROM Setup utility.
Floppy Disk Port 3F3h Read/Write Error	POD cannot read/write correctly on floppy disk port 3F3h. Run ROM Setup utility, then replace the motherboard.
Floppy Disk Port 3F3h Media Sensing Error	Port 3F3h, containing information concerning the type of floppy disk and support, failed a compatibility test. Run ROM Setup utility, then replace the motherboard.
PCI DAGGER AND LANCE CONTROLLER ERROR MESSAGES	
Device Name Not Available	When initializing, for the SCSI Inquiry command, there is no information available concerning the devices connected to the SCSI controller.
BIOS Not Installed	There are no SCSI devices connected to the controller that are supported by the BIOS.
Host Adapter Configuration Error	SCSI controller configuration error. Activate the ECU or ROM Setup utility.
Can't Locate Host Adapter	The Adaptec BIOS cannot communicate with the Dagger board. Replace the SCSI controller/motherboard.

ERROR MESSAGE	DESCRIPTION
Device Connected, but Not Ready	The SCSI device has failed the Test Unit Ready command during initialization. Check the connections and run the test on the device.
Start Unit Request Failed	The SCSI device has failed the Start Unit command at initialization. Check the connections and run the test on the device.
Time-out Failure During SCSI Inquiry Command!	There is no interrupt from the Dagger controller when the SCSI Inquiry command is sent during initialization. Replace the SCSI controller/motherboard.
Time-out Failure During SCSI Test Unit Ready Command	There is no interrupt from the Dagger controller when the SCSI Test Unit command is sent during initialization. Replace the SCSI controller/motherboard.
Time-out Failure During SCSI Start Unit Command	There is no interrupt from the Dagger controller when the SCSI Start Unit command is sent during initialization. Replace the SCSI controller/motherboad.
!!! WARNING!!!" A drive larger than 1 gigabyte has been detected with 64 head / 32 sector partitioning. This drive is not compatible with 255 head / 63 sector translation which has been enabled on this adapter. Data could be corrupted! Please check your system setup! Press any key to continue	An HDU with more than 1 GB has been formatted, with the controller configured to support lower capacity HDUs. Change configuration setting with ECU.
SYSTEM ERROR MESSAGES	
CPU Exception Error Has Occurred CPU Exception: xx POD Checkpoint: xxxx CPU Error Code: xx Physical Address: xxxx.xxxx	Reboot the system, if the problem persists replace the motherboard.
Configuration Memory Checksum Error	The configuration in the EEPROM memory is damaged. Activate the ECU.
CMOS Battery Lost Power	RTC CMOS battery low detected. Replace the motherboard and activate ECU.
CMOS Clock/Calendar Error	The real time clock does not keep the correct date and time. Run ROM Setup utility, replace the motherboard.
Clock Stopped	Run the diagnostic, replace the motherboard.
CMOS RAM Checksum Error	An error has been detected in the CMOS RAM data check. Activate ECU, run the diagnostic, replace the motherboard.
CMOS RAM Read/Write Error	CMOS RAM read/write error. Check the state of the RTC battery, then replace the motherboard.
Fail-Safe Timer Error	Error during the EISA timer test. Run the diagnostic, replace the motherboard.
CPU Slow-Down Timer Error	Error during CPU slow-down test. Run the diagnostic, replace the motherboard.
CPU Auto-Slow Timer Error	Error during CPU Auto-Slow timer test. Run the diagnostic, replace the motherboard.
CPU1 (Pentium APP) Ckpt: xxh Error	The Pentium APP (Application Processor) has failed the diagnostic test. The xxh value represents the checkpoint number which has failed. If this message is displayed the BIOS will not perform the IPC test on the secondary Pentium processor. Replace the motherboard.
CPU0 (Pentium BSP) IPC Interrupt Error	The Pentium BSP (Bootstrap Processor) has failed the internal interrupt test. Replace the motherboard.
CPU Triple Fault Error Has Occurred !!	CPU locking error. Run the diagnostic, replace the motherboard.
DMA Bus Timeout Error	Run the diagnostic, replace the motherboard.
CMOS Video Shadow RAM Config Error	EEPROM configuration error for video shadow. Run Setup utility.

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ERROR MESSAGE	DESCRIPTION
Video Option ROM Checksum Error	Optional board video BIOS checksum test failed. Run the diagnostic, remove the optional board.
Video Shadow at E000:/E800: Error	Video BIOS shadow failed as made in an area probably occupied. Run the Setup utility.
xxxxh Segment Shadow RAM Disabled/Error	An error has been detected during the optional ROM shadow in segment xxxh. Configuration of the optional board is incorrect, activate ECU.
Option ROM at xxxx:0000 Error	Optional ROM error. Configuration of the optional board is incorrect, activate ECU.
Invalid ROM Setup Image Unable to Invoke ROM Setup	Displayed when key F1 is pressed to run ROM Setup. ROM checksum error. Activate ECU.
Unknown EISA Board(s) Detected Unable to Invoke ROM Setup	Activate ECU.
Timer Ratio Test Error	CPU Timer Ratio test failed. Run the diagnostic, replace the motherboard.
Video Configuration Error	The type of video installed is not that configured. Run ROM Setup utility.
Press Enter Key to Continue	A non fatal error has occurred, the system can continue to operate by pressing Enter. Activate ECU.
Configuration Error(s) Detected... Run System Configuration Program	Configuration error. Activate ECU.
Hardware Error(s) Detected... Run Diagnostics Program	System hardware error. Run the diagnostic.
xxxx: Segment Shadow RAM Disabled/Error	Run ROM Setup utility.
RUN-TIME NMI ERROR MESSAGES (AFTER POD)	
NMI Error - PCI Transmitted Data Parity Error	Parity control error detected during a PCI board data transmission. Replace the board, then the motherboard.
NMI Error - PCI Received Data Parity Error	Parity control error detected during PCI board data reception. Change the board, then the motherboard.
NMI Error - PCI Address Parity Error	Parity control error detected on a PCI board address bus. Replace the board, then the motherboard.
NMI Error - PCI Level 2 Cache Parity Error	Parity control error detected in a PCI board second level cache. Replace the PCI board.
NMI Error - PCI Shutdown Special Cycle Error	A PCI board shutdown has taken place. Replace the board, then the motherboard.
NMI Error - PCI Target Abort Error	Error on PCI bus in target - abort cycle. Replace the PCI board, then the motherboard.
NMI Error - Unknown PCI Error Status Register Value	Unidentified PCI error. Replace the PCI board, then the motherboard.
NMI Error - System Memory Parity Fault	Parity error detected in the system memory. Replace the SIMMs, then the motherboard.
NMI Error - I/O Channel Check in Slot: xx	Error detected in I/O channel check on the board in slot x. Replace the board, then the motherboard.
NMI Scanning Base/Extended Memory for Errors	Error in I/O channel check and parity control viewed before the BIOS scans the system memory to reproduce the error condition. Replace the SIMM memory modules, then the motherboard.
Address Where Error Occurred = xxxxxxxxh in System Memory Bank: x	If the error has been reproduced, the BIOS shows the 32-bit address and the number of the memory bank (0-3). Replace the SIMMs on the indicated bank, then the motherboard.
Unable to Locate Parity/IOCC Error	Not possible to locate the NMI error.
Unable to Clear the Error Condition	The system cannot clear the error condition.
NMI Error - EISA DMA Bus Timeout in Slot: x	Timeout error on EISA bus for the board in slot x. Replace the board, then the motherboard.
NMI Error - EISA System Software Generated NMI	EISA subsystem software has generated an NMI. Replace board, then the motherboard.

ERROR MESSAGE	DESCRIPTION
NMI Error - EISA Fail-Sale Timer Timeout	Timeout error on Fail Sale Timer EISA. Replace the motherboard.
System is Halted - Please Reset	Displayed as last message if one of the previous messages is shown.
RUN-TIME ON MICROPROCESSOR ERROR MESSAGES (AFTER POD)	
ERROR - CPU Machine Check Condition Occurred	Indicates an error inside the CPU. The specific cause and address are indicated by one of the following messages. If the error is a locking error the message is preceded by "LOCKED".
Interrupt Acknowledge Cycle at Address: xxxxxxxxh	Replace the motherboard.
Special Cycle at Address: xxxxxxxxh	Replace the motherboard.
I/O Read Cycle at Address: xxxxxxxxh	Replace the motherboard.
I/O Write Cycle at Address: xxxxxxxxh	Replace the motherboard.
Code Read Cycle at Address: xxxxxxxxh	Replace the motherboard.
Unknown Cycle at Address: xxxxxxxxh	Replace the motherboard.
Memory Read Cycle at Address: xxxxxxxxh	Replace the motherboard.
Memory Write Cycle at Address: xxxxxxxxh	Replace the motherboard.
FATAL ERROR, System Halted	Displayed as last message after the address and type of CPU cycle have been indicated. It indicates that the error is not recoverable.
PASSWORD ERROR MESSAGES	
Invalid Password	Enter correct password, if it is not known set jumper JP6 on motherboard.
SYSTEM HALTED!	This appears after 3 incorrect passwords have been entered, if the password is not known, set jumper JP6 on the motherboard.

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

5

SYSTEM CONFIGURATION UTILITIES

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

The Built-IN ROM Setup program is described in Appendix E, the Storage Manager in Appendix F, while general information on the Starter Kit as far as software configuration is concerned is provided below.

ORCHESTRA SYSTEMA CD-ROM

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

- **Orchestra Systema Boot.** 3.5" 1.44 MB diskette which is used to boot to system and access the contents of the Orchestra Systema CD-ROM. This disk also contains the A:\CFG\SYSTEM.SCI file containing the current system configuration.

- **Orchestra Systema Diagnostics.** 3.5" 1.44 MB diskette (five languages) 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 to be used at user level.

- **Orchestra Systema CD-ROM.** CD-ROM containing all the software that can be installed on the systems (for example drivers) including the available configuration utilities. In an appropriate directory, this CD-ROM also contains a library of EISA and ISA configuration files which includes the *.CFG files for the different expansion boards that can be added to the system and that are therefore not present in the directory of the configurator.

  The user interface, called Orchestra Systema, is only available in English. This CD-ROM allows the following major functions:

    - Provide information on the configuration of EISA and ISA boards by means of the **EISA Configuration Utility** (ECU).

    - Automatically configure the EISA boards.

    - Provide information on the jumpoer settings of the more renown optional ISA boards.

    - Provide information on the resources assigned to PCI and P&P ISA boards.

    - By running the **Storage Manager Utility** (available for systems equipped with the RAID SCSI controller), check the hardware configuration of the RAID DPT SCSI controllers and of the devices connected to them, configure Disk Arrays and run SCSI subsystem diagnostics.

    - Report of any configuration conflict and attempt to solve it automatically.

    - Provide and support the configuration files (CFG) contained on the CD-ROM.

    - Create and update the System Configuration Information file (SYSTEM.SCI) on the boot diskette as backup for the system non-volatile memory.

    - Provide the online documentation relating to the boards installed in the basic module.

– **Install the Resilience Support software package** (only or systems in a resilience configuration with PEM) 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 PEM. The following are checked in particular:
- High temperatures, in the PEM
- Power supply failures, in the redundant PEM
- Fan failures, in the redundant PEM
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.

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

5

CONFIGURATION OF OPTIONAL BOARDS

Any system device requires available 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 Dagger 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 ROM Setup Utility or preferably the ECU. Also the RAID PCI SCSI controller must be confiured with the configuration utility residing in the board's own firmware.*

CONFIGURATION OF EISA AND ISA BOARDS

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

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

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

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

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

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

NOTES ON THE CONFIGURATION OF LINE BOARDS WITH AT INTERFACE

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

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

ORCHESTRA SYSTEMA CD-ROM EVOLUTION

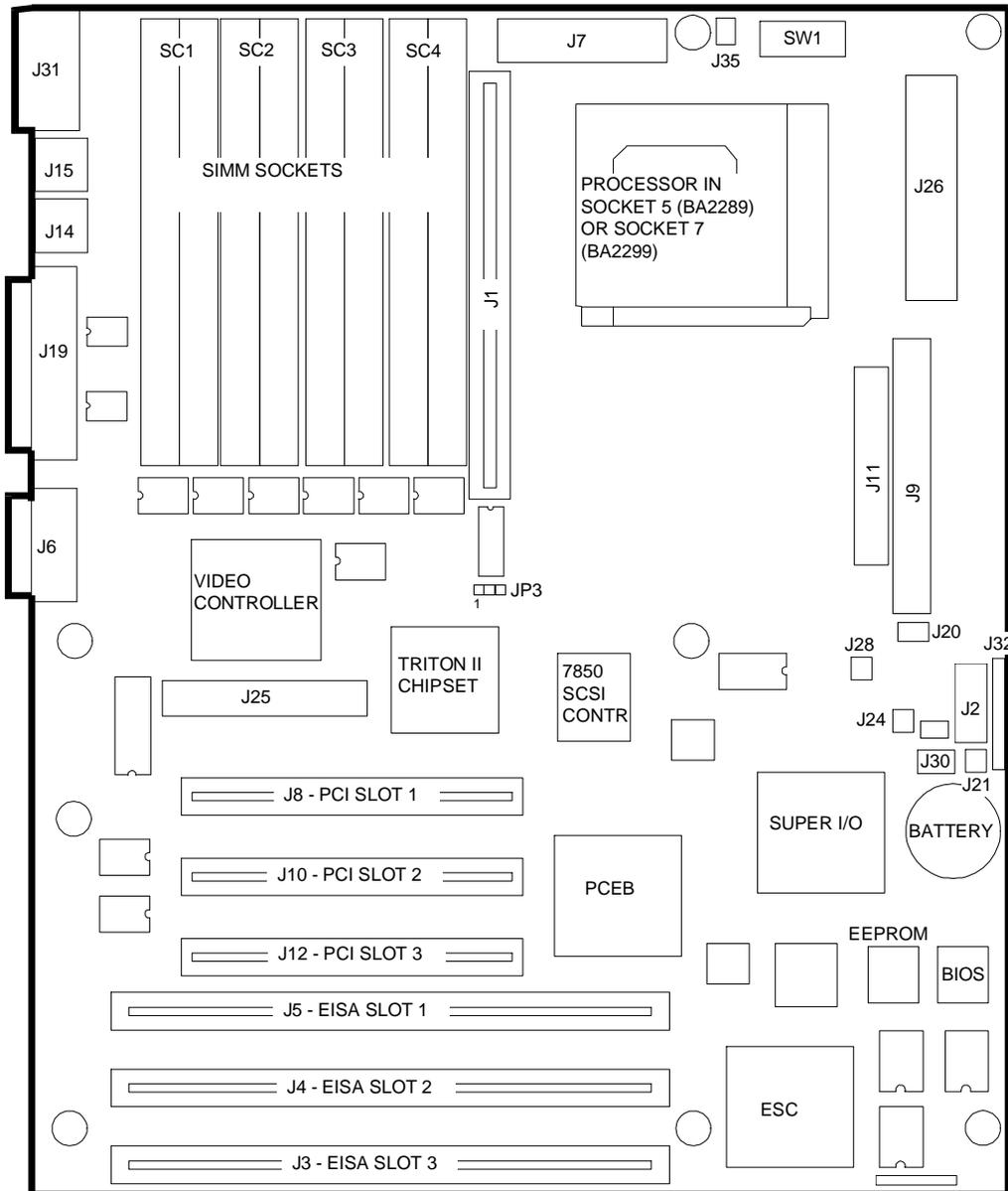| DATE	REL.	REASON FOR CHANGE
4/96	1.1	New Orchestra Systema CD-ROM code 2692499 E and boot diskette code 2692089 E, for the SNX 140/S. This CD has the following main programs: - Configuration Utility rel 1.01 based on the MCS ECU ver. 3.01. - Video drivers (Trident 9440-1D) for DOS and Windows rel. 1.04 upd 2 - AIC78XX SCSI driver, Manager set Release 1.2 - Storage Manager rel. 2.2 - Resilience Support rel 2.2 - Server View rel 2.0 - UPS Power Chute rel 4.2.1 driver for the following operating systems: 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. - UPS Power Net rel 1.0 driver for the following operating systems: Windows NT 3.51, NetWare 3.12, NetWare 4.1. - ZNIX V1.0 driver for the ZX312 LAN controller.
5/96	1.2	New Orchestra CD-ROM release code 2692511 W and boot diskette code 2692120 N which solves the following problems: preinstallation under Windows 95, installation under OS/2 rel 2.11 from CD-ROM and parameter display in "Review Global Setting". Also incorporates Server View release 2.01 that solves occasional problems in the WSM module. This modification is applied from the 91st system produced.
6/96	1.3	New Orchestra CD-ROM release code 2692500 G and boot diskette code 2693248 M, compatible with the SNX 140/S and SNX 160/S. The differences with respect to the previous version are the following: - Configuration Utility rel 1.01 upd 1 - EVD drivers 1.07 upd2 - AIC78XX SCSI drive, Manager set Release 1.21L - Resilience Support rel 2.3 with SAR support, except for SCO 3.2.4.2 - Multi support for NetWare 4.1x and OS/2 2.11 - Server View rel 2.02. This version of Orchestra is also used on the SNX 460/RS/RM; the specific software for each system, for example the Configuration Utility, is loaded automatically.
11/96	1.5	New Orchestra CD-ROM code 2692506 N-01 and boot floppy code 2693280 S with the following differences: - Configuration Utility rel 1.02 - Resilience support rel 2.4 - Solves problems with Olihit - OLISAR for all operating systems, OLIECC excluded - Solves the problems with the Help in the different O.S. - Server View rel 2.1. This version of Orchestra is also used on the SNX 460/RS/RM and 160/RS/RM; the specific software for each system, for example Configuration Utility, is loaded automatically. This Orchestra release is used on systems with BIOS rel 1.08 or later. **Note:** The International Help Desk WEB provides a patch (OLISAR rel 1.ff rev. 2.0) that solves a problem during the start of SAR in NT.

USER DIAGNOSTIC EVOLUTION

DATE	REL.	REASON FOR CHANGE
4/96	1.01	New User Diagnostics
6/96	1.03	Introduction of rel. 1.03 code 2693251 Q for compatibility with also the SNX 160/S. - HDU_DIA, CDR_DIA, DAT_DIA, STR_DIA, SPCI_DIA link with SCSI library ver. 0.30. - MEM_DIA: solves the multiple ECC recover error.

SYSTEM TEST EVOLUTION

DATE	REL.	REASON FOR CHANGE	CODE
4/96	1.01	New System Test for the SNX 140/S. Limitations: - Occasional hangs during a 256 MB RAM test - Occasional system errors during the thermostat subtest of the MAN_DIA test.	
6/96	1.03	New System Test release for compatibility with also the SNX 160/S: - HDU_DIA, CDR_DIA, DAT_DIA, STR_DIA, SPCI_DIA link with SCSI library ver. 0.29. - MAN_DIA: the thermostat test has been modified so as to allow more than one high temperature interval to be programmed. - MEM_DIA: solves the problem on the test pattern and with the multiple ECC recover error. - CPU_DIA: Removed Cache subtest.	

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MONOPROCESSOR MOTHERBOARD BA2289/2299 FOR THE SNX 140/S 100, 140/S 133, 140/S 166

J6	SVGA video connector (15-pin	J25	COM2 serial and parallel conn. (34-pin)
J31	COM1 serial port connector (9-pin)	J35	CPU active heatsink fan power supply
J14	PS/2 mouse interface connector		connector (not used)
J15	PS/2 keyboard interface connector	J26	VRM Header connector for the shorting
J19	External SCSI Narrow connector		block or VRM
J1	Connector for a 2nd level 256 KB cache (always present)	J24	PS-ON: the system is powered on or off by attaching a switch to this connector
J9	Internal SCSI Narrow connector	J30	4-pin Ext. Battery connector: allows the
J11	Floppy disk connector		addition of an external battery for the RTC.
J7	Motherboard power supply connector		On BA2299 this connector is used to
J32	Speaker connector, power supply LED HDU access LED. On BA2299 is used for the SAR board (MI2117)		power the SAR board
		J20	Ext FAN +12 V connector for the external fan (not used)
J21	Jumper in series with the battery (always present)	J2	Dual Host connector (not used)
		J28	Reset connector (not used)

DIP-SWITCHES AND JUMPERS

DIP-Switch SW1 (DIP1, DIP2, DIP4, DP5) - CPU Clock Settings

DIP1	DIP2	DIP4	DIP5	BUS/CORE FREQ.	BUS/CORE RATIO	NOTES
OFF	OFF	ON	ON	50/75	2/3	
ON	OFF	ON	OFF	60/120	1/2	
ON	ON	ON	OFF	60/150	2/5	
OFF	OFF	OFF	ON	66/100	2/3	To be used on the SNX 140/S 100 equipped with a Pentium 100
ON	OFF	OFF	ON	66/133	1/2	To be used on the SNX 140/S 133 equipped with a Pentium 133
ON	ON	OFF	ON	66/166	2/5	To be used on the SNX 140/S 166 equipped with a Pentium 166

Note: *It is important to set these switches correctly since the processor speed could be differ (for example, the Pentium 133 with the jumper set for 100 MHz will work at a reduced clock rate of 100 MHz, while setting a higher clock rate will make the processor work beyond its specifications).*
These switches are factory set and their setting must not be changed.

Note: *The bus/core 50/75 frequency can also be used if U17 and R215 are fitted on the motherboard and not R283; the AIC 7850 rev B SCSI controller is used. There are no restrictions on the new boards that use the AIC 7850 rev. D SCSI controller.*

DIP-Switch SW1 (DIP6) - Configuration By-pass

DIP6	DESCRIPTION
OFF	Normal setting (default). At power on the system is set according to the configuration stored in CMOS RAM.
ON	The system is set according to the default configuration. The configuration stored in CMOS RAM is ignored together with all the security features

DIP-Switch SW1 (DIP3 and DIP7) - Refresh Rate

DIP-SWITCH SW1	FUNCTION	SETTING	NOTES
DIP3	HA27 at Vcc	OFF	Not used
DIP7	HA27 at Gnd	OFF	

Warning: *Do not set both DIP3 and DIP7 to the ON position at the same time; the power supply's protection against short cuircuits could prevent the system from powering on.*

DIP-Switch SW1 (DIP8)

Not used, set to OFF.

Jumper J13 - Second Level Cache Size

J13 SETTING	DESCRIPTION	NOTES
Pins 1-2	512 KB cache	Not used
Pins 2-3	256 KB cache	Setting used on the SNX 140/S

MICROPROCESSOR

Depending on the system, the motherboard can host the following processors:

- 100/66 MHz Pentium 100 on the SNX 140/S 100
- 133/66 MHz Pentium 133 on the SNX 140/S 133
- 166/66 MHz Pentium 166 on the SNX 140/S 166

On motherboard BA2289 the processor is installed in Socket 5, while on motherboard BA2299 it is installed in Socket 7. The processor can be optionally replaced with an Intel OverDrive processor up to P54CT on the BA2289 and up to P55CT on the BA2299.

The motherboard is equipped with VRM Header connector J26 that allows the installation of an external voltage regulator, VRM, or of a shorting block.
If the motherboard is equipped with a Pentium 100 or Pentium 133 processor that needs to be powered in the standard mode, the shorting block must be connected to connector J26 so that +3.3 V are supplied to the processor.
If instead the motherboard uses the Pentium 166 processor, which must be powered in the VRA mode, the AL2021 VRM must be inserted into connector J26 so that + 3.45 V (3.4-3.6 V) are supplied to the processor.
On the board there is also the possibility of selecting the clock frequency ratio between the bus and processor core. Selection is made using DIP-Switch block SW1 (refer to the section "DIP-Switches and Jumpers").

A passive heatsink (without fan) mounted on the chip is sufficient to cool down the processor. In this case active heatsink fan connector J35 is not used.

EISA I/O AND PCI EXPANSION BUS

On the motherboard there are six expansion slots, all bus masters and five of which can be used for the installation of optional boards. There are three EISA slots for EISA, ISA and ISA P&P boards, three PCI slots for PCI boards. PCI slot 3 (J12) and EISA slot 1 (J5) are considered from a logical point of view as a single shareable slot since the two slots are physically close together in which case a single board can be installed; PCI boards are installed in the PCI slot while EISA, ISA or ISA P&P boards are installed in the EISA slot. With EISA or PCI slots there are no priorities.

VIDEO CONTROLLER

The onboard video controller is a Trident SVGA TGUI9440 implemented on the PCI bus. The video memory is 512 KB. The supported video modes are VGA-compatible with the following resolutions:

Standard Video Mode

Mode	Resolution/ Colors	Pixel Rate (MHz)	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Memory (KB)	Address
0H, 1H	320x200-16	28	31,4	70	256	B800
2H, 3H	640x200-16	28	31,4	70	256	B800
4H, 5H	320x200-4	25	31,4	70	256	B800
6H	640x200-2	25	31,4	70	256	B800
7H	720x350-mono	28	31,5	70	256	B000
DH	320x200-16	25	31,4	70	256	A000
EH	640x200-16	25	31,4	70	256	A000
10H	640x350-16	25	31,4	70	256	A000
11H	640x480-2	25	31,4	60	256	A000
12H	640x480-16	25	31,4	60	256	A000
13H	320x200-256	25	31,4	70	256	A000

Mode	Resolution/Colors	Pixel Freq. (MHz)	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Memory (KB)	Address
50H	640x480-16	25	31.5	60	256	B800
51H	640x473-16	25	31.5	60	256	B800
52H	640x480-16	25	31.5	60	256	B800
53H	1056x350-16	40	31.3	70	256	B800
54H	1056x480-16	40	31.3	60	256	B800
55H	1056x473-16	40	31.3	60	256	B800
56H	1056x480-16	40	31.3	60	256	B800
57H	1188x350-16	45	31.3	70	512	B800
58H	1188x480-16	45	31.3	60	512	B800
59H	1188x473-16	45	31.3	60	512	B800
5AH	1188x480-16	45	31.3	60	512	B800
5BH_1	800x600-16	36	35.2	56	256	A000
5BH_2	800x600-16	50	48.1	72	512	A000
5DH_1	640x480-256	25	31.6	60	512	A000
5DH_2	640x480-256	32	38.2	72	512	A000
5EH_1	800x600-256	36	35.5	56	512	A000
5EH_2	800x600-256	50	48.3	72	512	A000
5FH_1	1024x768-16	45	35.5	87i	512	A000
5FH_2	1024x768-16	65	48.5	60	512	A000
5FH_3	1024x768-16	75	56.5	70	512	A000
60H	1024x768-16	45	35.7	87i	512	A000
61H	1024x768-16	45	37.3	70i	512	A000
6AH_1	800x600-16	36	35.2	56	256	A000
6AH_2	800x600-16	50	48.1	72	512	A000
6BH	320x200-16M	40	36.1	70	512	A000
70H	512x480-32	40	31.4	60	512	A000
71H	512x480-64	40	31.4	60	512	A000
72H	640x400-32K	50	30.2	70	512	A000
73H	640x400-64K	50	30.2	70	512	A000
7EH	320x200-32K	25	31.4	70	512	A000
7FH	320x200-64K	25	31.4	70	512	A000

SYSTEM MEMORY

There are eight 72-pin SIMM sockets on the motherboard. The chipset memory controller is programmed to support 36-bit ECC fast page mode SIMMs.
Any change made to the memory capacity is automatically recognized by the BIOS during system power on. There are no hardware settings to be made.

Listed below are the memory configuration rules:

- The system sees onboard memory as being divided into two banks (1, 2, 3 and 4). Each bank consists of two sockets on the motherboard. Bank 1: double socket SC4, Bank 2: double socket SC3, Bank 3: double socket SC2, Bank 4: double socket SC1.

- The SIMMs must always be installed in pairs so as to fill an entire memory bank. Each pair consists of two SIMMs of the same type and must have the same density, capacity and speed.

- SIMMs of different capacity can be installed in the same system, but not in the same memory bank.

- Always install the SIMMs starting from bank 1 (socket SC4).

- The minimum memory configuration is 16 MB expandible to 256 MB.

The following SIMMs are to be used:

PDG NAME	CAPACITY	MEMORY EXPANSION KIT
EXM 53-016	16 MB	Two Single Sided 8 MB, 60 ns (2 MB x 36) SIMMs
EXM 53-032	32 MB	Two Double Sided 16 MB, 60 ns (4 MB x 36) SIMMs
EXM 53-064	64 MB	Two Single Sided 32 MB, 60 ns (8 MB x 36) SIMMs

Note: *The PdG lists codes 52-016, 52-032, 52-064 which are identical to the kits listed in the table with the only difference that they are installed at the factory.*

The following table provides some of the possible memory configurations.

TOTAL MEMORY	BANK 1 SOCKET SC4		BANK 2 SOCKET SC3		BANK 3 SOCKET SC2		BANK 4 SOCKET SC1	
16 MB	8 MB	8 MB						
32 MB	8 MB	8 MB	8 MB	8 MB				
48 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB		
64 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB
80 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	16 MB	16 MB
112 MB	8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	32 MB	32 MB
48 MB	8 MB	8 MB	16 MB	16 MB				
80 MB	8 MB	8 MB	16 MB	16 MB	16 MB	16 MB		
112 MB	8 MB	8 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB
144 MB	8 MB	8 MB	16 MB	16 MB	16 MB	16 MB	32 MB	32 MB
80 MB	8 MB	8 MB	32 MB	32 MB				
144 MB	8 MB	8 MB	32 MB	32 MB	32 MB	32 MB		
208 MB	8 MB	8 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
32 MB	16 MB	16 MB						
64 MB	16 MB	16 MB	16 MB	16 MB				
96 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB		
128 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB
160 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	32 MB	32 MB
96 MB	16 MB	16 MB	32 MB	32 MB				
160 MB	16 MB	16 MB	32 MB	32 MB	32 MB	32 MB		
224 MB	16 MB	16 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB
64 MB	32 MB	32 MB						
128 MB	32 MB	32 MB	32 MB	32 MB				
192 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB		
256 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB

SCSI CONTROLLER

The SCSI controller embedded on the motherboard is implemented on the PCI bus and provides a single-ended fast SCSI-2 Narrow channel based on the Adaptec AIC7850 controller (Dagger). This chip is a bus master interface controller that can take control of the bus and transfer data to system memory at the maximum speed allowed on the PCI bus (133 MB/sec), while the data transfer rate from/to the SCSI bus is 10 MB/sec. There are two 50-pin Narrow connectors on the board, one internal J9 and one high density external J19. Internal connector J9 is used for the connection of the system internal SCSI peripherals, and is always connected, while external connector J19 is used for the connection of any external SCSI peripheral, PEM excluded.

Up to eight devices (controller, HDU, STU, etc.) can be connected to the SCSI channel, and these are assigned IDs from 0 to 7. The SCSI controller ID must always be set to 7 by means of the ECU.

The SCSI terminators are present on the motherboard, are active and are usually enabled. They are automatically disabled when both SCSI connectors (internal and external) are used.

The controller is configured by means of the ECU by using the same procedure described for the Dagger GO2124 SCSI controller in Appendix C. There are no SCSI configuration jumper settings to be made on the motherboard.
The configuration rules for the SCSI channel on the SNX 140/S are described in Appendix K.
Connector J32 also provides the signals for the HDU Activity LED on the console.

BOARD BA2289 (P.c.b. code 654496 T) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
04/96	Nasc	210920 E	New board with BIOS WP53. The first BIOS release is 1.03 code 212697 Z lev. Nasc. The BIOS evolutions are described further on. This board is only assembled on the first 100 units (for Japan only). It is configured to accept the SAR MI2117 board and the processor is installed in Socket 5. This board is equipped with the Triton II step A1 chipset. Board MI2117 is only supplied when ordered by the client.	Factory
-	01AG		Triton II (pos. U1) chipset evolution from step A1 to step A2. TGUI9440 Trident video controller (pos. U15) evolution from Rev. B to Rev. D. A strategic B.O.M. has been created for the supply of materials. Board no longer manufactured, information for field use only.	Field
-	02AG		AIC7850 (pos. U51) SCSI controller evolution from Rev. B to Rev D. Board no longer manufactured, information for field use only.	Field
-	01		The system crashes during the OS/2 stress test due to a chipset failure during arbitration. Replace the programmed EPLD "EAGLE_B" (U33) Funct. N. WP72 with the EPLD "EAGLE2_D" Funct. N. WP88. Board no longer manufactured, information for field use only.	Field
-	01S1		Triton II chipset (pos. U1) evolution from step A2 to step A3. Board no longer manufactured, information for field use only.	Field

BOARD BA2299 (P.c.b. code 654496 T) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
05/96	Nasc	212712 X	New board to replace the BA2299. SAR board MI2117 is always plugged into this board, the processor is installed in Socket 7 and the Hobbes board socket is present.	Factory
6/96	01		New Intel Triton II step A2 (pos. U1) component to replace the step A1 version. The main feature of the evolution from step A1 to A2 is the SERR signal management for the ECC.	Factory
6/96	01S1		TGUI9440 Trident (pos. U15) video controller evolution from Rev. B to Rev. D.	Factory
9/96	02		AIC7850 (pos. U51) SCSI controller evolution from Rev. B to Rev D.	Factory
10/96	03		The system crashes during the OS/2 stress test due to chipset failure during arbitration. Replace the programmed EPLD "EAGLE2_C" (U33) Funt. N. WP75 with EPLD "EAGLE2_D" Funct. N. WP88.	Factory
12/96	04		Triton II chipset (pos. U1) evolution from step A2 to step A3.	Factory

DUALPROCESSOR MOTHERBOARD BA2255 FOR THE SNX 160/S 133, 160/S 166

J6   SVGA video connector (15-pin)
J31 COM1 serial port connector (9-pin)
J14 PS/2 mouse interface connector
J15 PS/2 keyboard interface connector
J19 External SCSI Narrow connector
J1   512 KB second level cache module
     connector (always present)
J16 Internal SCSI Wide connector (HDU)
J9   Internal SCSI Narrow output connector
     (to the first removable)
J18 Internal SCSI Narrow input connector
     (from the last removable)
J29 Hot Pluggability connector (not used)
J11 Floppy disk connector
J7   Motherboard power supply connector
J32 SAR board connector (MI2117)

J25   COM2 and parallel connector (34-pin)
J34/35 CPU active heatsink fan power supply
      connectors (not used)
J26   VRM header connector for shorting block
      or VRM (for 2 CPUs)
J24   PS-ON: attaching a switch to this
      connector powers the system on and off
J23   INTRUDE connector (not used)
J17   HOBBES connector (not used)
J30   4-pin Ext. Battery connector: used to
      power the SAR board
J20   +12 V Ext FAN connector for the external
      fan (not used)
J2   Dual Host connector (not used)
J28   Reset connector (not used)
J21   Jumper in series with bat. (always present)

DIP-SWITCHES AND JUMPERS

DIP-Switch SW1 (DIP1, DIP2, DIP4, DP5) - CPU Clock Setting

DIP1	DIP2	DIP4	DIP5	BUS/CORE FREQ.	BUS/CORE RATIO	NOTES
ON	ON	ON	ON	50/125	2/5	
ON	OFF	ON	ON	50/100	1/2	
OFF	OFF	ON	ON	50/75	2/3	
ON	OFF	ON	OFF	60/120	1/2	
ON	ON	ON	OFF	60/150	2/5	
OFF	ON	ON	OFF	60/90	2/3	
OFF	OFF	OFF	ON	66/100	2/3	
ON	OFF	OFF	ON	66/133	1/2	To be used on the SNX 160/S 133 equipped with a Pentium 133
ON	ON	OFF	ON	66/166	2/5	To be used on the SNX 160/S 166 equipped with a Pentium 166

Note: *It is important to set these switches correctly since the processor speed could be differ (for example, the Pentium 133 with the jumper set for 100 MHz will work at a reduced clock rate of 100 MHz, while setting a higher clock rate will make the processor work beyond its specifications).*
These switches are factory set and their setting must not be changed.

DIP-Switch SW1 (DIP6) - Configuration By-pass

DIP6	DESCRIPTION
OFF	Normal setting (default). At power on the system is set according to the configuration stored in CMOS RAM.
ON	The system is set according to the default configuration. The configuration stored in CMOS RAM is ignored along with all the security features.

DIP-Switch SW1 (DIP3 and DIP7) - Refresh Rate

DIP-SWITCH SW1	FUNCTION	SETTING	NOTES
DIP3	HA27 at Vcc	OFF	Not used
DIP7	HA27 at Gnd	OFF	

Warning: *Do not set both DIP3 and DIP7 to the ON position at the same time; the power supply's protection against short cuircuits could prevent the system from powering on.*

DIP-Switch SW1 (DIP8)

Not used, position OFF.

Jumper J13 - Second Level Cache Size

J13 SETTING	DESCRIPTION	NOTES
Pins 1-2	512 KB cache	Setting to be used on SNX 160/S
Pins 2-3	256 KB cache	Not used

MICROPROCESSOR

One or two microprocessors can be installed on this motherboard. The basic configuration comes with only one processor installed, with the possibility of optionally installing a second one.
Depending on the system, the motherboard can be fitted with the following processors:

- 133/66 MHz Pentium 133 (primary and secondary) on the SNX 160/S 133

- 166/66 MHz Pentium 166 (primary and secondary) on the SNX 160/S 166

The two processors are installed in the two Socket 7s and, depending on the socket in which they are inserted, they work as the primary or secondary; in fact, during system boot the main processor acknowledges the presence of the processor in the second socket and automatically sets the handshake protocol. The primary processor can be optionally replaced by an Intel OverDrive processor up to the P55CT.

The motherboard is equipped with a VRM Header connector J26, identical for both processors, that allows the installation of the external voltage adjuster, VRM, or shorting block.
If the motherboard is equipped with Pentium 133 processors that need to be powered in the standard mode, the shorting block must be connected to connector J26 so that +3.3 V are supplied to the processor.
If instead the motherboard uses Pentium 166 processors, which must be powered in the VRA mode, the VRM must be inserted into connector J26 so that + 3.45 V (3.4-3.6 V) are supplied to the processor.

Note: *If only only one Pentium 166 processor is installed, the AL2021 VRM may be installed. When a second processor is installed and the AL2021 module is present, this VRM must be replaced with the AL2026 version that provides the necessary power for a dualprocessor configuration.*

On the board there is also the possibility of selecting the clock frequency ratio between the bus and processor core. Selection is made using DIP-Switch block SW1 (refer to the section "DIP-Switches and Jumpers").

A passive heatsink (without fan) mounted on the chip is sufficient to cool down the Pentium 133 processor. In this case active heatsink fan connectors J34 and J35 are not used.
To cool down the Pentium 166, an active heatsink (heatsink + fan) needs to be fitted on the processor chip. The power supply cables for the fans of the two processors are directly connected to onboard connectors J34 and J35, indifferently.

EISA I/O AND PCI EXPANSION BUS

On the motherboard there are six expansion slots, all bus masters and five of which are used by optional boards. There are three EISA slots for EISA, ISA and P&P ISA boards and three PCI slots for PCI boards. PCI slot 3 (J12) and EISA slot 1 (J5) are considered, from a logical point of view, and a single shareable slot since only one board can be installed being both slots physically close top each other. PCI boards are installed in the PCI slot while EISA, ISA or P&P ISA boards are installed in the EISA slot. EISA and PCI slots do not have priorities.

VIDEO CONTROLLER

The video controller embedded on the motherboard is a Trident SVGA TGUI9440 implemented on the PCI bus. 1 MB of video memory is available. The supported video modes are VGA-compatible and the supported resolutions are the same as those supported by the BA2289/99 motherboard plus those allowed when having a 1 MB video memory instead of 512 KB. The additional resolutions are those indicated in the following table:

Extended Video Mode

Mode	Resolution/ Colors	Pixel Rate (MHz)	Horizontal Freq. (KHz)	Vertical Freq. (Hz)	Memory (MB)	Address
5CH	640x400-256	25	31.6	70	1	A000
62H_1	1024x768-256	45	35.5	87i	1	A000
62H_2	1024x768-256	65	48.5	60	1	A000
62H_3	1024x768-256	75	56.5	70	1	A000
62H_4	1024x768-256	80	59.5	75	1	A000
63H_1	1280x1024-16	75	46.9	87i	1	A000
63H_2	1280x1024-16	108	63.0	60	1	A000
65H_1	1600x1200-16	108	54.5	87i	1	A000
6CH	640x480-T	75	31.4	60	1	A000
74H_1	640x480-32K	50	31.4	60	1	A000
74H_2	640x480-32K	65	40.1	72	1	A000
75H_1	640x480-64K	50	31.4	60	1	A000
75H_2	640x480-64K	65	40.1	72	1	A000
76H	800x600-32K	72	35.2	56	1	A000
77H	800x600-64K	72	35.2	56	1	A000

SYSTEM MEMORY

As on motherboard BA2289/99 (see the related section).

SCSI CONTROLLER

The SCSI controller embedded on the motherboard is implemented on the PCI bus and provides a single-ended fast SCSI Wide channel based on the Adaptec AIC7870 controller (Lance). This chip is a bus master interface controller that can take control of the bus and transfer data to system memory at the maximum speed allowed on the PCI bus (133 MB/sec), while the data transfer rate from/to the SCSI bus is 20 MB/sec. The Lance controller also supports standard 8-bit Narrow peripherals.
The board is also configured with the following:

- 68-pin internal Wide high density connector J16 used for the connection of the internal SCSI Wide HDUs.

- Two 50-pin internal Narrow connectors, one J9 connected to the removable SCSI Narrow peripheral and one J18 deriving from the last removable SCSI Narrow peripheral. In this way the SCSI channel is closed on the terminators present on the motherboard.

- A 50-pin external high density connector, J19, used to connect external SCSI Narrow peripherals, excluding the PEM.

Up to 16 SCSI devices can be connected to the 16-bit SCSI Wide channel, controller included, and are assigned IDs ranging from 0 to 15. Only IDs from 0 to 7 are used on this system. The SCSI controller must always have an ID of 7, set by means of the ECU.

The SCSI terminators are on the motherboard and are active. The terminators on the high part of the Wide bus are always enabled while those on the low part and shared between Wide and Narrow, are usually enabled but are automatically disabled if connections are made to the internal and external SCSI connectors.

The controller is configured by means of the ECU and by means of the same procedure described for the GO2109 SCSI Wide controller in Appendix C. There is no SCSI configuration jumper settings to be made.
The rules for configuring the SCSI channel on the SNX 160/S are described in Appendix K.
Connector J32 also provides the signals for the HDU activity LED on the console.

The following block diagram shows the SCSI channel path.
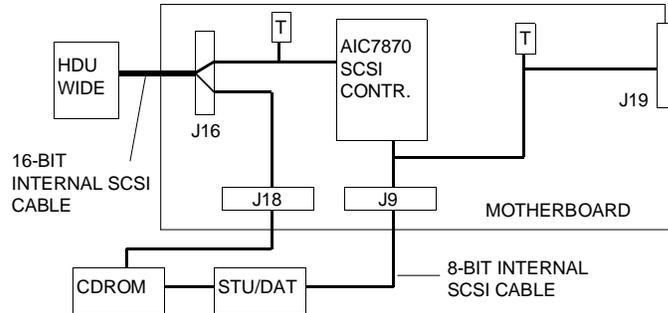
BOARD BA2255 (P.c.b. code 654496 T) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
6/96	Nasc	210777 J	New board with BIOS WP53. The first BIOS release is 1.06 code 212697 Z lev. 02. The BIOS evolutions are described further on. An SAR board is always is always pluged into socket J32 on this board. This board is equipped with the Triton II step A2 (82430 HX) chipset.	Factory
6/96	01AG		TGUI9440 Trident video controller (pos. U15) evolution from Rev. B to Rev. D.	Factory
10/96	01		The system crashes during the OS/2 stress test due to chipset failure during arbitration. Replace the programmed EPLD "EAGLE2_C" (U33) Funt. N. WP75 with EPLD "EAGLE2_D" Funct. N. WP88.	Factory
12/96	02		Triton II chipset (pos. U1) evolution from step A2 to step A3.	Factory

BIOS WP53 EVOLUTION FOR THE BA2289, BA2299, BA2255

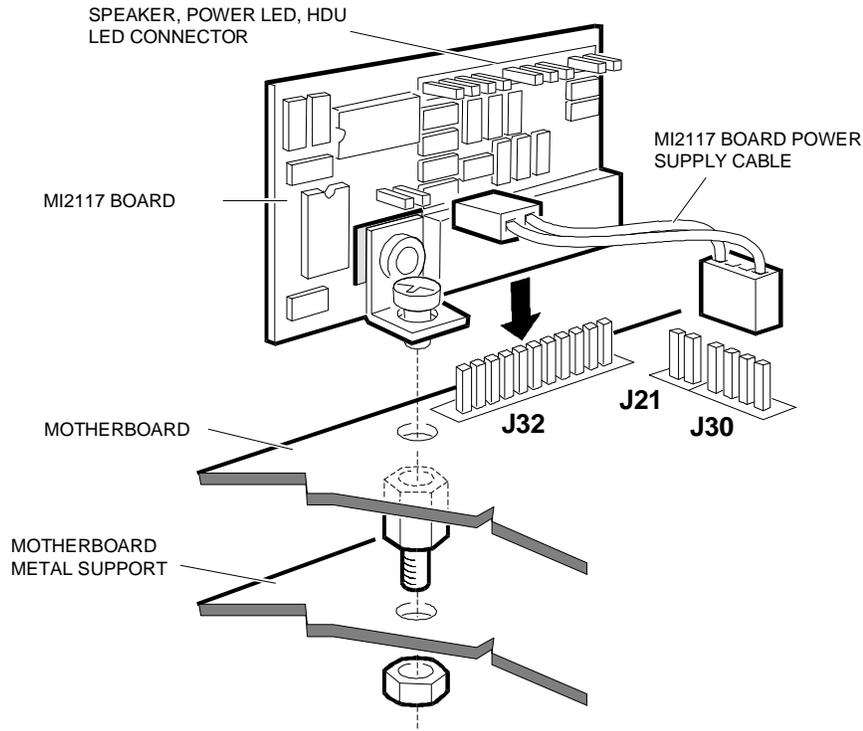| DATE	LEV.	BIOS	CODE	REASON FOR CHANGE
4/96	Nasc	1.03	212697 Z	New BIOS for the SNX 140/S. This BIOS release does not support the SAR feature.
5/96	01	1.05		New BIOS release compatible for the SNX 140/S and SNX 160/S. This BIOS has the following features: - EISA to PCI Line Buffer enabled by default. - The Lance controller data are correctly stored in NVRAM during the POD. - Trident BIOS change to version A57. - Modification to support 64 Mbit SIMMs. - 512 KB cache memory acknowlededment and support. - Change in the SIO component initialization, in accordance with the board autorestart feature. - Change in the Triton II chipset initialization, step A1, A2 only, in compliance with the Intel "82430 PCIset rev. 2.21 specifications. - The Microp. Data Area is now only available for the SNX160/S. - Extended cacheability enable from 64 MB to 512 MB. If this BIOS is flashed on systems with BIOS 1.03 and WNT 3.51 installed, the data must be saved on HDU and the operating system reinstalled after the flash operation.
6/96	02	1.06		New BIOS release: - Solves the POD error message "Simm X mismatch error" where X is the bank number. - Modification, as suggested by Intel, in the way in which the memory bank is recognized. - Solves the problem detected during the O.O.B. tests
11/96	03	1.08		New BIOS release: - New Adaptec 1.24 code to remove the Beta Version writing. - Support for the SAR feature. This BIOS release must be phased with the Starter Kit containing Orchestra rel. 1.5.
3/97	04	1.09		New BIOS release: - Correct management of the year 2000 - Support for the 200 MHz CPU - Support for the AIC7880 (Ultra), AIC7870 (Lance) and AIC7850 (Dagger) SCSI controllers

MI2117 SAR BOARD

The first 90 SNX 140/S units equipped with motherboard BA2289 are not automatically booted when the power is restored following a line voltage failure but are always switched into a standby state where the operator must manually press the power on button.

To correct this inconvenience, plug board MI2117 into the motherboard connector J32. When line voltage is restored, this board automatically sets the system in the condition it was in before the shutdown occurred; in other words, if the system was on, the boot routine is automatically executed while if it was in standby it will switch to the standby mode.

Nota: *Board MI2117 can only be installed upon client request on the first 100 SNX 140/S systems manufactured that are not equipped with this board. On all successive SNX 140/S systems that are equipped with the BA2299 and on all the SNX 160/S systems that are equipped with the BA2255, board MI2117 is always present.*

This board also gives hardware support to the system so that the SAR (Systema Automatic Restart) feature can be managed. This feature allows, following a system crash due to hardware or software failures, to automatically reset and reboot the system so that it becomes available once again within a short period of time without the user having to carry this operation out manually. The following items are required for this board to operate:

- Operating system capable of handling the SAR feature
- Server View or an operating system that allows the SAR to be enabled or disabled
- Motherboard hardware setting (SAR board + 2-8 minute counter)
- A BIOS capable of supporting this feature.

BOARD SAR MI2117 (P.c.b. Code 654521 T) EVOLUTION

DATE	LEV.	VIMO CODE	REASON FOR CHANGE	APPLIC.
05/96	Nasc	212714 Z	New SAR board.	Factory

NOTES AND LIMITATIONS

CONFIGURATION

- The EISA boards that work in the DMA-C mode are not supported. This problem is solved by BIOS release later than 1.03.

- PCI boards with the PCI-to-PCI bridge are not supported if equipped with the earlier DEC chipset version while they are supported with the new chipset. A bypass is available so the boards with the earlier chipset can still be used. This bypass consists of sharing the same PCI interrupt line on all the channels on the board.

- The problems concerning the compatibility with the new NCU 9181S board is solved by configuring the board interrupt to "EISA Sharable Mode" instead of "AT Compatible Mode".

- With BIOS 1.06, do not power off the system during the POD since errors could occur during the next diagnostic session. In this case the system needs to be reconfiured.

- If the user enters an incorrect password, the correct one will have to be entered twice.

- The ROM Setup Utility (F1) is currently unavailable for this system, however the Configuration Utility gives the possibility of enabling this feature; in reality F1 is always disabled.

- The Configuration Utility does not display addresses C8000-DFFFF used by the Lance controller. If dual-port controllers are configured in this area (<32 KB free), A PCI configuration is carried out during the boot phase.

- Setting the Video Shadowing option at E800 or Not Shadowing, the following message is displayed during the POD of the next boot: "Floppy Disk Type configuration Error".

- IRQ14 must not be used with the DPT controller due to problems with the User Diagnostic.

- When using PCI LAN boards, check the congruency between the board I/O addresses and correct if necessary.

OPERATING SYSTEMS

- Under NT and after a software reboot, the Configuration Utility 1.01 up1 informs, in a yellow window, that the configuration of the system is blocked. In order to change the configuration of the system with the configurator, power the system off and then on again.

- With the UnixWare 2.0.3 operating system, the shutdown -i6 command does not work from the 128 MB RAM mark onwards. The system is therefore unable to restart automatically so the power on-off sequence needs to be carried out.

- The Easy-installation operation crashes during the NetWare 3.12 post-installation phase. A software bypass is described in the release notes of Orchestra 1.2.

- To install Windows NT 3.51 on systems configured with the RAID DPT Wide controller and therefore with the PEM, the operating system needs to be installed with the PEM disconnected from the system. The PEM must then be reconnected once installation is completed.

- The HCT VDM (VGA) test fails under Windows NT 3.51. If the test is launched from the DOS prompt, as suggested by Microsoft in the cases when the test fails, the test will be performed correctly. This restriction is caused by an error in the Trident BIOS of the video controller which will be solved and integrated in the system BIOS release later than 1.03.

- The VMD and SNFMVDM tests that are included in the IBM test kit, fail under OS/2 3.0. IBM accepts this limitation.

- With the UnixWare 2.0x with USF file system and Windows NT 3.51 operating systems, and when disks with a capacity greater than 1 GB are installed, use to configurator to go to the "BIOS and Device Configuration" option of the SCSI controller and in the "BIOS Configuration" submenu set the parameter "Extended Translation for Drives > 1 GByte" to Disabled.

- To install the SCO 3.2.4.2 operating system with the DPT controller connected to the PEM and with the boot HDU connected to the onboard Lance controller, the DPT board must be installed after installation.

- With SCO 3.2.4.2 and when using the DPT controller, a DPT Logger Termination may occasionally occur. Repeat the application manually.

- With Windows NT 3.51, Sony 4x CD-ROM read errors; there are no problems with the Panasonic 4x CD-ROM.

- With NetWare 3.12 and 4.1, to correctly execute the LAN test with two or more PCI boards the I/O address of these boards must be configured manually.

- In the SMP environment of NetWare 4.1, the LAN drivers contained in the operating system need to be used for the NEXXXX boards.

- With Windows NT 3.51, Sony 4x CD-ROM read errors; there are no problems with the Panasonic 4x CD-ROM.

ORCHESTRA

- SCO 5.0 postinstall: no connection to the COM2 serial port is found when using the Easyinst Express mode to install the UPS.

- OS/2 Warp postinstall: the Easyinst Custom mode does not work correctly if activated after a package installation made using Express Easyinst.

- SCO 3.2.4.2 and SCO 5.0 postinstall: the PowerChute package must be installed as "Multi-user Mode" and not on "Console"

- A new NT 3.12 patch is required to solve the impossibility of installing PowerNet because the CD-ROM cannot be mounted in NetWare 3.12.

SERVER VIEW

- Autodiscovery may not work; insert the system manually.

- NetWare 3.12: with two Lance controllers, when analysing the system from WS (Expansion Bus icon) the onboard controller is interpreted as being generic instead of SCSI.

■