InfoServer 100 System Specification

This document describes the system of the InfoServer 100 product.

Revision History:
* 0.1 - 04/13/90 Jeff Peng, Dave Paolino - Preliminary Document
* 0.2 - 04/18/90 Jeff Peng - Added RRD drive information
* 1.0 - 06/14/90 Jeff Peng - Modified SCSI Bus ID Assignment, changed product name

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CHAPTER 1

INTRODUCTION

1.1   SCOPE AND ORGANIZATION OF THIS DOCUMENT

This document provides the functional specification for the InfoServer 100. It is organized into 8 chapters as outlined below:

- Chapter 1 - contains an introduction to the product.
- Chapter 2 - summarizes the system and subsystem architecture.
- Chapter 3 - describes the possible configurations
- Chapter 4 - describes the physical characteristics of the system.
- Chapter 5 - describes the external and internal cabling of the system.
- Chapter 6 - describes the power and cooling sub-systems.
- Chapter 7 - describes the reliability and serviceability requirements of the system.
- Chapter 8 - summarizes the required testing and evaluation of the system.

1.2   ETHERNET SYSTEM SERVER GENERAL DESCRIPTION

The InfoServer 100 is a high performance server that is based on the TEAMMATE II hardware. The InfoServer 100 software is a unique kernal specifically developed for the product. This software supports the LAD/LAST protocol which allows client systems to access InfoServer 100 storage over the Ethernet as if it was mounted as a locally attached device. Performance is enhanced by utilizing system memory as a cache for storage data. The MOP protocol is supported and provides the means of loading the client system from the server. The LAT protocol will support remote management of InfoServer 100 from any LAT terminal.

Client software support at FRS will be limited to VMS. Ultrix, MSDOS, and OS2 client software support is planned.

InfoServer 100 will be offered in two general configurations. The first is a SCSI CD ROM based system which will allow CD media to be shared with multiple client systems on the network. The 3 major applications for this configuration are:

- .   software distribution
- .   on-line documentation
- .   boot server for Mariah class systems

The other InfoServer 100 configuration provides paging and swapping capability with SCSI read/write storage for X-terminal support. The InfoServer 100 read/write storage provide memory paging capability over the ethernet network to multiple Decwindow terminals, thereby achieving a major improvement in terminal performance.

CHAPTER 2

INFOSERVER 100 FUNCTIONAL OVERVIEW

2.1 SYSTEM OVERVIEW

The heart of the CPU module is the CVAX/CFPA Vax chipset. The CPU module has the following functions/features: 4 mb of system memory, 256Kb rom, ethernet interface (thin-wire and AUI), 4 serial lines, two SCSI ports (SCSI A and SCSI B) for internal and external SCSI storage devices, and a diagnostic display.

InfoServer 100 supports both SCSI 3.5" read/write and 5.25" CD read-only half height storage devices in the system. Up to two CD Roms and three read/write drives can be installed in the enclosure. A SCSI expansion bus allows storage expansion of up to six CD drives externally.

The RRD40 CD drive and adapter module will be supported in the system. The integrated SCSI CD drive will be supported once that device is qualified.

The components that make-up the core system can be seen in Figure 1 & 2.

Figure 1: InfoServer 3D SYSTEM VIEW, (For RRD40 Interface)

EXTERNAL
SCSI (B)

Upper Plate

RRD40

RZ23

SCSI Terminators

MODIFIED
DUAL
CABLE

RRD40

RRD40   Adaptor
Board

Internal
SCSI (A)

CPU BOARD
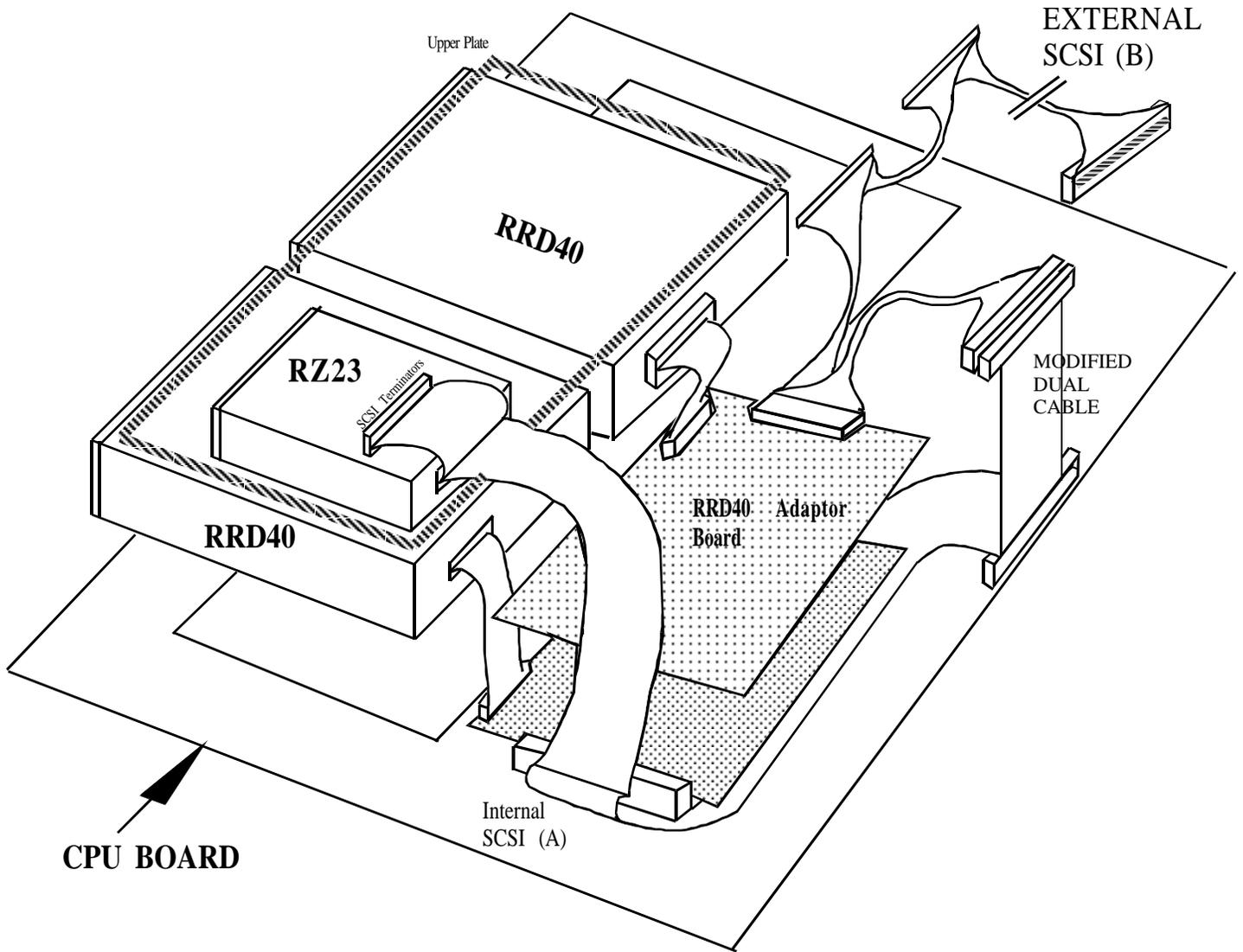
Figure 2:   InfoServer 100 3D SYSTEM VIEW, (For Integrated CD Drive Interface)

Top Plate

EXTERNAL
SCSI (B)

Integrated SCSI
CD Drive

RZ23

MODIFIED
DUAL
CABLE

ntgrated CD Drive

INTERNAL
SCSI (A)
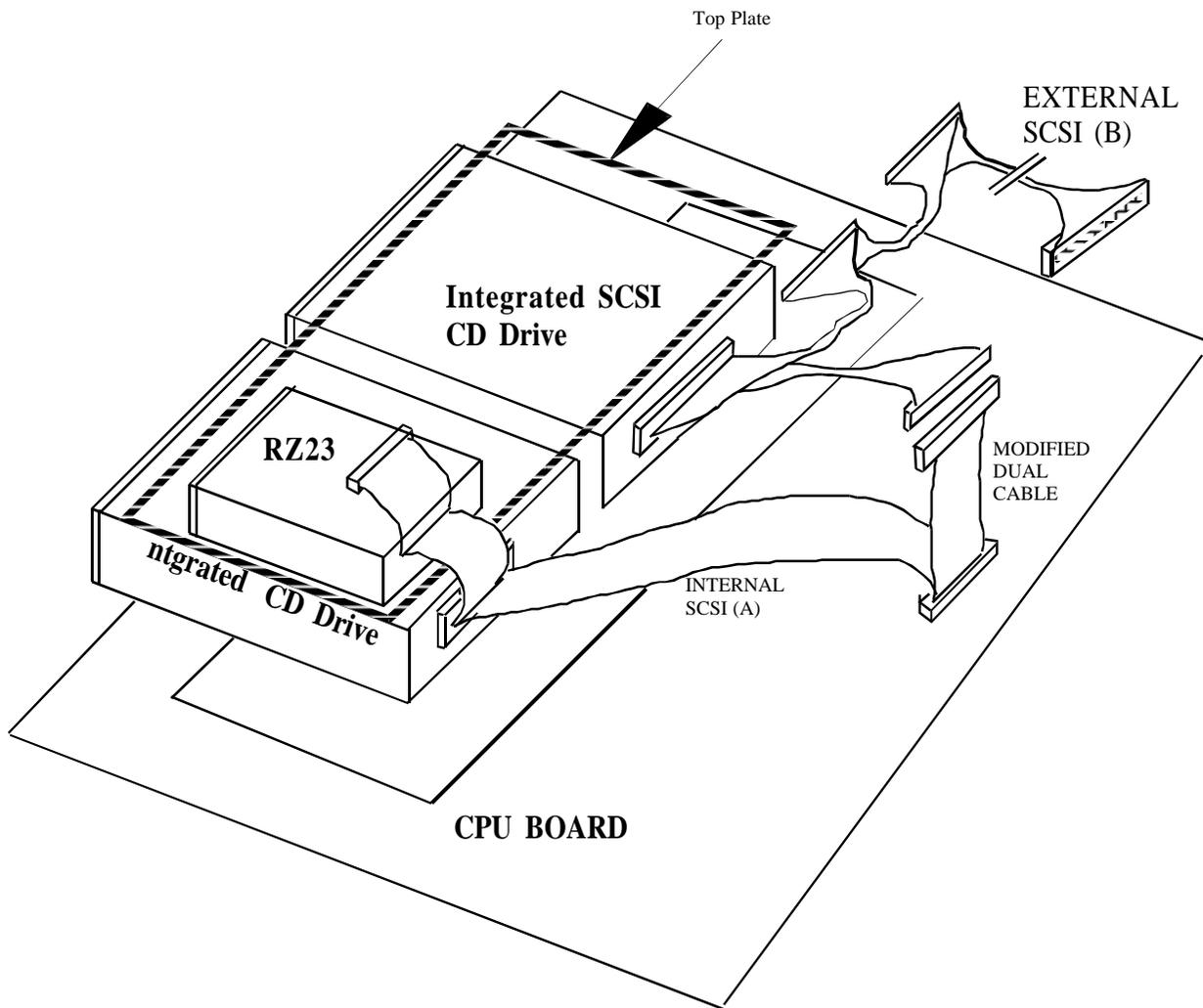
CPU BOARD

Figure 3:   Front View Of InfoServer 100

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┌──────────────────────────────────────────────────────────────┐
│ ┌─────────────┐                              ┌──────────────┐  │
│ │             │                              │    RZ23      │  │
│ │  Power      │          Upper Plate         │              │  │
│ │             │  ──────────────────────────  └──────────────┘  │
│ │  Supply     │  ┌─────────────────┐ ┌──────────────────────┐ │
│ │             │  │  RRD40    or    │ │  RRD40      or        │ │
│ │  F          │  │ Integrated CD Drive│ │ Integrated CD Drive  │ │
│ │  a          │  └─────────────────┘ └──────────────────────┘ │
│ │  n          │                   Lower Plate                 │
│ │  s          │  ────────────────────────────────────────      │
│ │             │             CPU Board                          │
│ └─────────────┘  ══════════════════════════════════           │
└──────────────────────────────────────────────────────────────┘
```
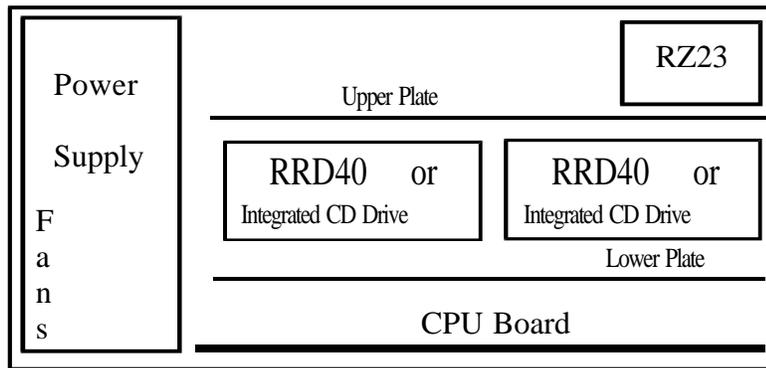
Figure 4:   Right side View Of InfoServer 100 with RRD40 Drive

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┌──────────────────────────────────────────────────────────────┐
│ ┌─────────────────────┐                                        │
│ │                     │                                        │
│ │       RZ23          │         Upper Plate                    │
│ │                     │                                        │
│ └─────────────────────┘  ─────────────                         │
│                                    RRD40 ADAPTOR BD            │
│ ┌─────────────────────┐                                        │
│ │                     │            RRD40 ADAPTOR BD            │
│ │      RRD40          │         ═══════════════════════        │
│ │                     │                                        │
│ └─────────────────────┘                                        │
│         Lower Plate                                            │
│  ─────────────────────────────────────────                    │
│                    CPU Board                                   │
│          ═══════════════════════════════                      │
└──────────────────────────────────────────────────────────────┘
```
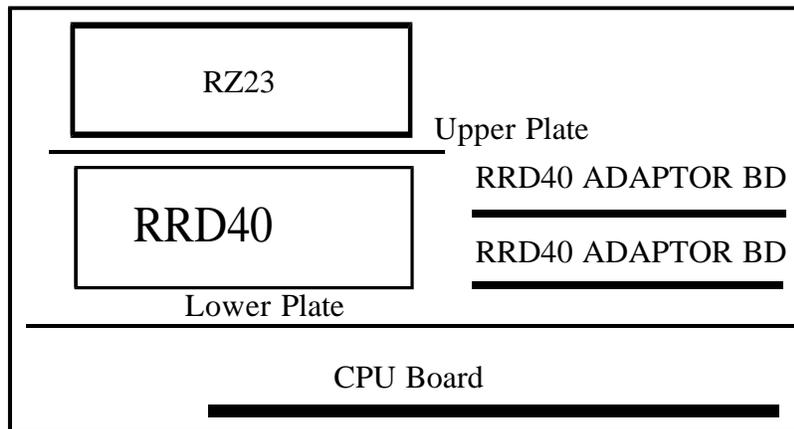
Figure 5:   Right side View Of InfoServer 100 with Integrated CD Drive

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┌──────────────────────────────────────────────────────────────┐
│ ┌─────────────────────┐                                        │
│ │      RZ23           │         Upper Plate                    │
│ └─────────────────────┘                                        │
│  ─────────────────────────                                     │
│ ┌───────────────────┐                                          │
│ │  Integrated CD    │                                          │
│ │  Drive            │            Lower Plate                   │
│ └───────────────────┘                                          │
│  ─────────────────────────────────────────                    │
│                    CPU Board                                   │
│          ═══════════════════════════════                      │
└──────────────────────────────────────────────────────────────┘
```
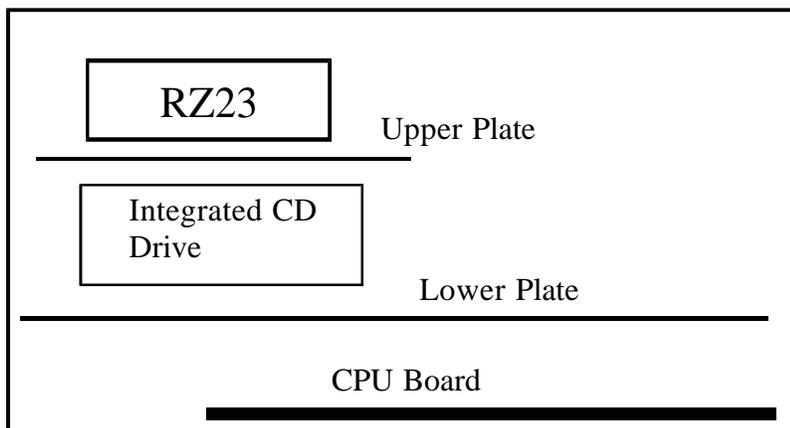
2.2 CPU BOARD

The CPU board has been developed from the KA41 CPU board used in the TEAMMATE II system. For details on the CPU board refer to the InfoServer 100 CPU board (KA41) Specification.

The CPU board is composed of, but not limited to, the following functionality and components:

1. DC341 CVAX and DC513 CFPA floating point unit (FPU)
2. 4 Mbytes of parity checking RAM memory
3. 256 Kbytes of ROM memory—unique to the InfoServer 100
4. 32 byte Ethernet address ROM
5. Time of Year Clock
6. Ethernet Interface
7. SCSI/SCSI controller
8. 4 Serial Lines (1 with limited modem control)
9. Start-up Diagnostics

2.2.1 Central Processor

The central processor consists of a DC341 CVAX and a DC513 CFPA floating point unit (FPU). The key features of the central processor include:

1. Implements a subset of the VAX instruction set.†
2. Implements a subset of the VAX data types.
3. Supports F, D, and H floating point data types.
4. Full VAX memory management.
5. A 32-bit memory data bus.

2.2.2 Ram Memory

The CPU board provides 4 Mbytes of RAM memory. The memory is longword aligned and can be read or written in one bus cycle. Memory data integrity is provided by a parity associated with each byte of memory.

2.2.3 ROM Memory

The CPU board ROM contains the following:

1. Diagnostic Code
2. Console Code
3. Processor Restart Code
4. I/O Driver Code

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† For details see the CVAX chip spec.

5. Another ROM contains the SCSI/SCSI related code

The contents of these ROM's are detailed in the KA41 System Firmware Specification.

2.2.4   Ethernet Address ROM

The CPU board contains 32 byte ROM that holds a unique 32-bit network address for each InfoServer 100 system.

2.2.5   Time of Year Clock

The CPU board contains a battery backed up time of year clock that keeps the date and time of day. A rechargeable, nickle-cadmium battery provides power to the time of year clock when system power is off. When starting from a fully charged state, the battery will maintain valid time and date for a minimum of 100 hours. The battery is automatically recharged when system power is on.

2.2.6   Ethernet Interface

The system board permits attachment of Thinwire or Thickwire Ethernet to the system (one logical port). Selection being made by a switch on the rear panel.

2.2.7   Serial Lines

The CPU board provides four asynchronous SLUs. Three of the SLUs are used for general purpose and are DEC 423 compatible. The fourth SLU provides a RS 232 communication port with modem control. See Table 6 for signal/pin definition.

2.2.8   Mass Storage

The CPU board supports a dual port Small Computer Standard Interface (SCSI) controller to provide a mass storage interface to InfoServer 100.

The SCSI/SCSI Controller provides InfoServer 100 with "A" & "B" SCSI ports. Both ports are used to service the user disks. The first SCSI port may connect to an internal read/write storage device for server software usage. The second port also allows the attachment of external SCSI mass storage devices to the system. The number of external SCSI mass storage devices allowed depends on the number of internal storage devices. The total number of devices (internal and external) permitted on the SCSI bus is seven.

2.3   STORAGE DEVICES

Table 1 below lists the mass storage devices supported by the InfoServer 100. All are half height devices.

Table 1: InfoServer 100 Supported storage Devices

Unit	Controller	Size/Type	Storage
RZ23	SCSI	3.5 R/W	105 Mb
RRD40	SCSI	5.25 CD	600 Mb
Integrated Drive	SCSI	5.25 CD	540 Mb

2.3.1 SCSI ID Assignments

Table 2 below shows the ID assignments for both SCSI ports: ‡

Table 2: Recommended SCSI Port ID Assignments‡

ID	SCSI A (internal)		ID	SCSI B(internal & External)
7	reserved	|	7	RRD40 expansion box
6	SCSI A adapter	|	6	SCSI B Adapter
5	reserved	|	5	Internal RRD40 Drive
4	reserved	|	4	RRD40 expansion box
3	reserved	|	3	RRD40 expansion box
2	RRD40	|	2	RRD40 expansion box
1	RZ23	|	1	RRD40 expansion box
0	reserved	|	0	RRD40 expansion box

2.3.2 External Mass Storage

The System's CD storage capacity can be increased by the addition of external SCSI devices. An external connector on the rear of InfoServer 100 provides access to one of the SCSI busses.

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‡ These ID's are recommendations only. The SCSI bus will support upto 7 drives in total, the drives need not necessarily be what is defined in this table.

CHAPTER 3

INFOSEVER 100 CONFIGURATIONS

3.1   CONFIGURATIONS

InfoSever 100 will be offered, initially, in two configurations: one for software distribution and on-line documentation, and the other for the X-terminal support. The exact configuration of these systems will not be specified in this document, however system configuration guidelines are given below.

3.1.1   System Configuration Guidelines

A user configured system allows the addition of any of the storage device options listed in Table 3.

Table 3:   Internal Storage Options for InfoSever 100

SHELF	Device
Upper	RZ23
Lower	up to 2 RRD40 or Integrated CD Drive

3.1.2   System Configuration Rules

The above table represents the permissable storage options. However there are specific positions for the various drives according the the quantity and mix. These option build rules are listed below.

Number of RZ23's –

- 1 – Top Right (Minimum)

Number of RRD40 or RRD41 Drives:

- 1 – lower right (Minimum)
- 2 – lower right + lower left

CHAPTER 4

INFOSERVER 100 PHYSICAL SPECIFICATIONS

4.1 ENCLOSURE

The InfoServer 100 is housed in its own enclosure. The enclosure is the same as the TEAM-MATE II modeL-20, Except for modifications to the lower drive plate and moving brackets for the RRD40 adaptor models.

Table 4: InfoServer 100 Enclosure Dimensions

	Inches	CentiMeters
Width	18.26	46.38
Depth	15.75	40.00
Height	5.90	14.99

The enclosure of InfoServer 100 has a plastic decorative front and rear bezel. The top, bottom, and sides of InfoServer 100 consist of sheet metal.

4.2 EXTERNAL SWITCHES

The InfoServer 100 contains the following external switches.

1. Power on switch—

    The AC power on switch is located on the rear of the System. This switch controls the application of AC power to the InfoServer 100's power supply.

2. Halt switch –

    The halt switch is a momentary contact push-button switch located in the rear of the InfoServer 100. This switch will, when pressed, apply a HALT signal to the System processor.

3. Break Enable switch –

    This switch will enable and disable the System from halting on the reception of a BREAK sequence on COMMS port #1. A LED is illuminated when the switch is in the "enable halt" mode.

4. Network Select switch –

    The Network Select Switch is a push-button switch, which when operated selects either the thin or thick wire Ethernet port. An LED indicator is illuminated to show which port has been selected.

4.3 EXTERNAL LEDs

Other than the three LEDs memtioned above, the InfoServer 100 contains the following externally visible LEDS.

1. Power On LED –

   The power on LED will be illuminated when AC power is applied to the InfoServer 100 power supply. This LED is visible from the front of the enclosure.

2. System State Indicator LEDs –

   The eight system state indicator LEDs are located on the system board and are visible from the rear of the enclosure. These LEDs are used during testing and initialization. The LEDs are divided into two fields of four. The left field of four LEDs indicates the current state of the system; the meaning of the right field of four LEDs is dependent on the state of the first field. For details on the possible states and substates that the eight LEDs indicate, refer to KA41 Firmware Specification.

4.4 ENVIRONMENTAL SPECIFICATIONS

The InfoServer 100 will conform DEC STD 102 Class B modified. See Appendix A for Specification Tables.

CHAPTER 5

INFOSERVER 100 CONNECTORS AND CABLING

5.1 EXTERNAL CONNECTORS

InfoServer 100 contains the following external connectors, which are located on the rear panel of the enclosure as shown in Table 5 and Figure 6 below.

Table 5:	InfoServer 100 External connectors	
One	- Communications Port (25 pin D-Sub)	mounted on CPU board
Three	- Async Port (6 pin MMJ)	mounted on CPU board
One	- Ethernet AUI (15-pin D-sub)	mounted on CPU board
One	- Ethernet Thinwire (BNC)	mounted on CPU board
One	- SCSI bus connector (50-pin)	Rear panel mounted
One	- AC Power Input Connector	mounted on PSU

Figure 6: NETWORK SERVER SYSTEM Rear View

PTT LABEL AREA

IDENT LABEL AREA   EXT SCSI   ON/OFF
                                        SWITCH

CLASSIC   ENET   THIN-WIRE   HALT   DEC 423   RS232   DIAGNOSTIC   AC POWER
ENET   SELECT   ENET   SWITCH   CONNS   MODEM   LED'S   I/P
CONN   SWITCH   CONN   CONN   SKT
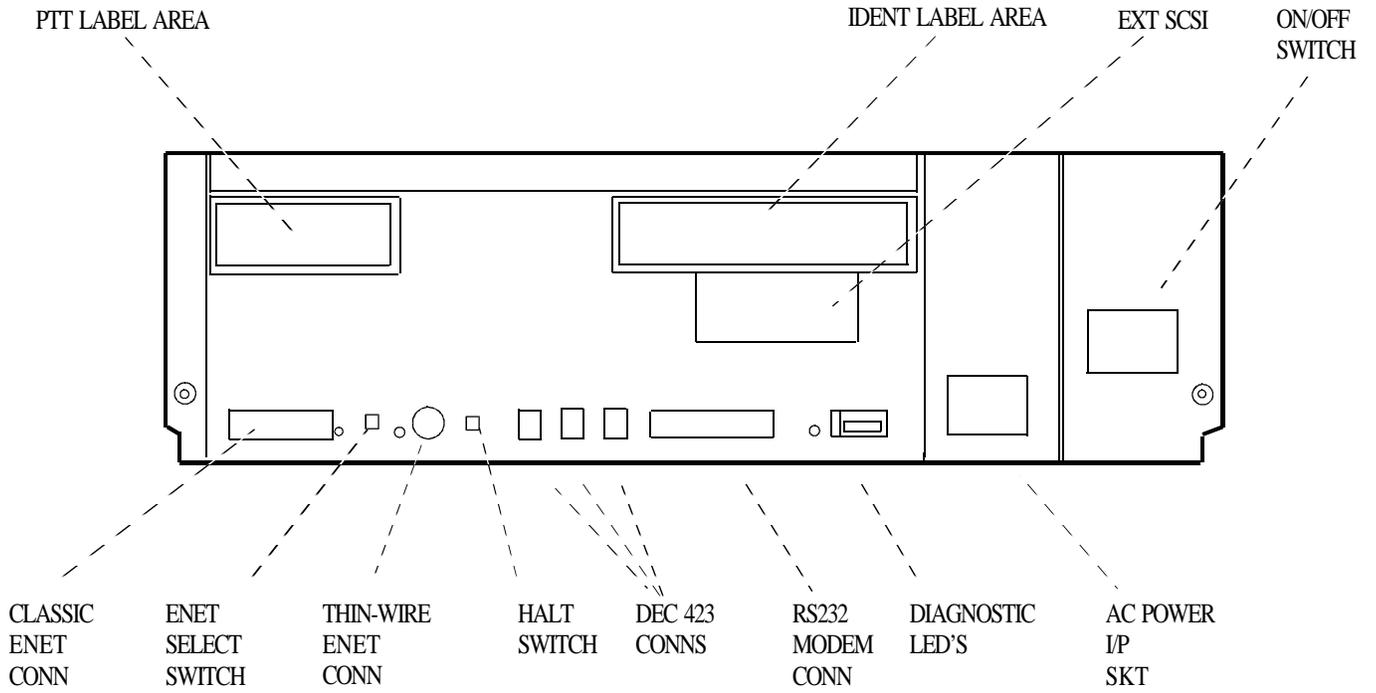
5.1.1 RS232 modem, communications Port (J13 on CPU board)

The communication port will support RS232 as specified in DEC STD 052. The pinning for
the 25 way male D-Sub is shown in Table 6 below. Unused pins are terminated per DEC
STD 052.4.

Table 6: InfoServer 100 25 way D Sub Pin out

Pin	Signal(CCITT)	DIN	DEC	Source
1†	101	E1	CHASSIS GND	
2	103	D1	TX	DTE
3	104	D2	RX	DCE
4	105	S2	RTS	DTE
5	106	M2	CTS	DCE
6	107	M1	DSR	DCE
7	102	E2	SIG GND	
8	109	M5	CD	DCE
9	NOT USED			
10	NOT USED			
11	NOT USED			
12	112	M4	SPD	DCE
13	NOT USED			
14	NOT USED			
15	NOT USED			
16	NOT USED			
17	NOT USED			
18	141	PS3	LLBK	DTE
19	NOT USED			
20	108.2	S1.2	DTR	DTE
21	NOT USED			
22	125	M3	RI	DTE
23	111	S4	DSRS	DTE
24	NOT USED			
25	142	PM1	TMI	DCE

† OPTIONAL; via a jumper on the CPU board

5.1.2 DEC423 ports (J4, J6, J10 on CPU board)

The three async ports are compatible to DEC423 as specified in DEC STD 052, data leads
only. The pinning for the MMJ is shown in table Table 7 Unused pins are terminated per
DEC STD 052.4.

Table 7: InfoServer 100 Modified Modular Jack Pin out

Pin	Signal	Direction
1	Pulled up to +5v via 150 ohm resistor	None
2	Transmit Data +	Out
3	Transmit Data -	Out
4	Receive Data -	In
5	Receive Data +	In
6	3k Ohm to Frame ground	None

5.1.3 Ethernet Connections

InfoServer 100 provides a connection to the Ethernet by either Thinwire (BNC) or AUI (15 pin D-sub) connection, but not both simultaneously.

5.1.3.1 AUI Connection(J2 on CPU board)

For AUI (Thickwire) connection, the female 15-pin D-sub connector will be used. the pin-out of the connector is shown in Table 8 below.

Table 8: InfoServer 100 AUI Ethernet Connector Pin out

Pin	Description
1	Chassis Ground
2	Collision +
3	Transmit +
5	Receive +
6	+12 volts return, logic ground
9	Collision -
10	Transmit -
12	Receive -
13	+12 volts, fuse protected

5.1.3.2 Thinwire Connection (J3 on CPU board)

A female BNC connector will be used for attachment of the Thinwire Ethernet.

5.1.4 SCSI Bus Connector (50 pin)

The second SCSI port will be brought out of the InfoServer 100 box using a 50-pin ANSI standard connector. The form of this connector is shown in Figure 7 below and the pin-out of this connector is shown on Table 18 in Appendix B. This connector conforms to ANSI X3.131-1986, Single-Ended (Shielded Connector, Alternative 2)

Figure 7: External SCSI Connector, 50 Way CHAMP

```
     1 . . . .            . . . . 25
    26 . . . .            . . . . 50
```

5.1.5   AC Power Input Connector

The AC Power Input Connector is used to provide AC power to the InfoServer 100. For more information on the InfoServer 100 power system refer to Chapter 6.

5.2   INTERNAL CONNECTORS

Referring to Figure 8 below, the InfoServer 100 system will contain the following internal connectors.

*   CPU board SCSI/SCSI bus (J8)

*   Power Supply to CPU board (J14)

*   CPU board to Memory Expansion Option (J7 and J12)

*   Battery Connection (J1)

*   Unused connectors: J5, J9 and J11

Figure 8: CPU board Connectors

MMJ ASYNC PORTS

RS232 MODEM
COMM PORT

THINWIRE
BNC CONNECTOR

THICKWIRE D-SUB
CONNECTOR (AUI)

POWER SUPPLY
CONNECTOR

J13   J10   J6   J4   J3   J2

J14

J9

J8

SCSI/SCSI
CONNECTOR

J11   J5

ACLO
(RESERVED)

J12   J7

J1

BATTERY
CONNECTOR

MEMORY EXPANSION
CONNECTORS

COMMS OPTION
CONNECTORS
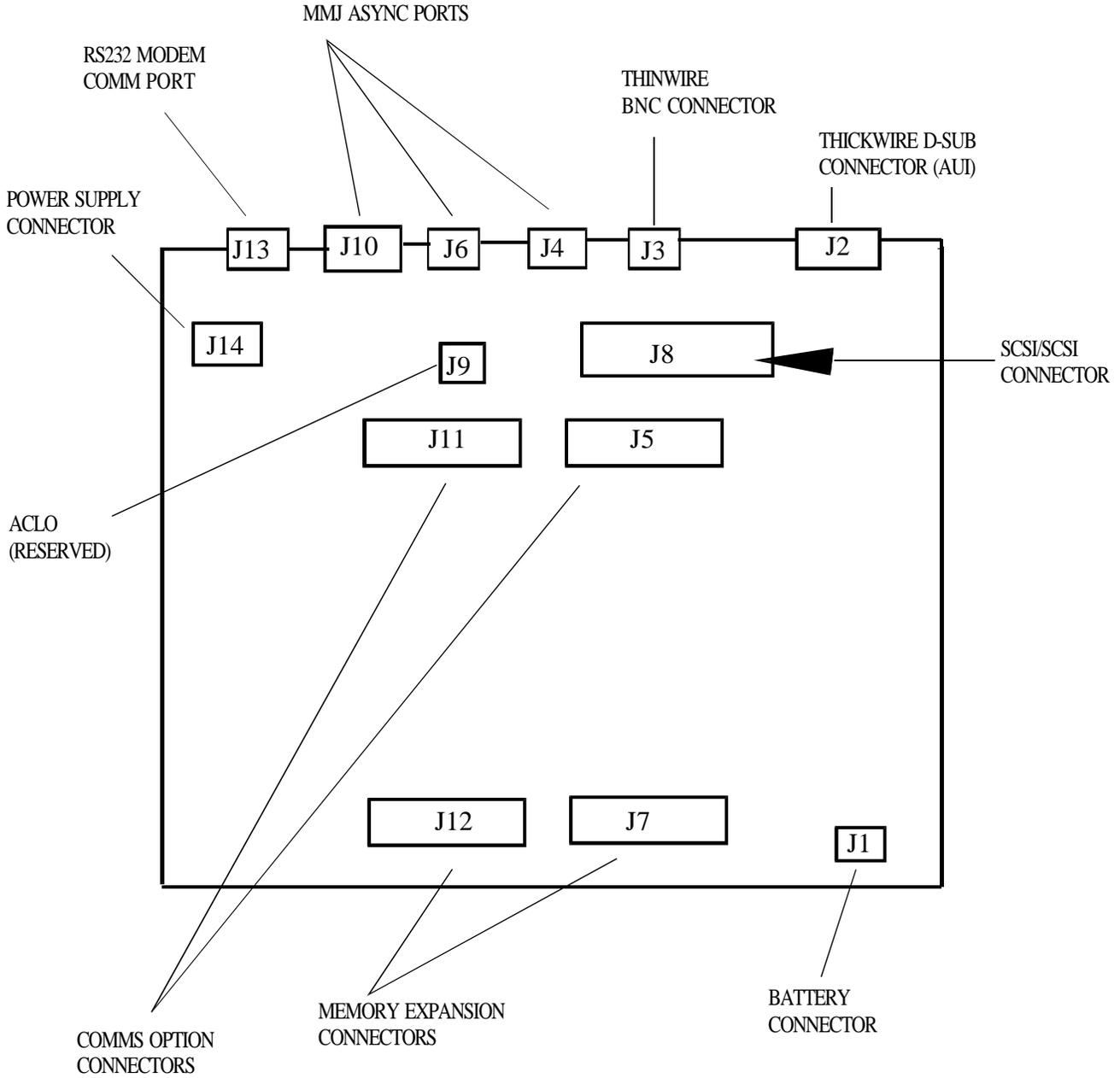
NOTE: For detailed   description   of the connectors,   Please   refer   to Section   5.2

5.2.1 SCSI/SCSI Connector (100 way J8)

This connection is used to carry the two SCSI busses to the SCSI devices. The cable used to carry these signals is a twin 50 way ribbon. For connection details refer to Table 19 in Appendix B

5.2.2 Power Supply To CPU board (J14)

The power supply connects to the CPU board by a 14-pin connector. For connection details refer to Table 20 in Appendix B

5.2.3 CPU board To Memory Expansion Module (J7 and J12)

The memory option board is connected to the system board with two 40-pin double-row connectors on the CPU board. For connection details refer to Table 21 in Appendix B

5.2.4 Battery connection (J1)

The re-chargable battery for the TOY clock and RAM is connected to the CPU board via J1.

5.2.5 ACLO connector (J9)

This connector is reserved for future use.

5.2.6 CPU board jumper positions

Functional positioning of the CPU jumpers are shown in Table 9

Table 9: jumper table

Jumper	State	Function
LK1	In	Normal connection of DMG
	Out	DMG isolated from board to allow test
LK2,LK3,LK6	X,X,In	DZ top speed is 19.8 Kbaud
	In,Out,Out	DZ top speed is 19.2 Kbaud
	Out,In,Out	DZ top speed is 38.4 Kbaud
LK4,LK5	In,In	Sysconfig register normal operation mode
	Out,X	Invalid
	X,Out	Invalid
LK7	Out	Modem port pin 1 floating
	In	Modem port pin 1 grounded
LK8	In	Thick wire 802.3 compliance
	Out	Thick wire non 802.3 compliance
LK9	In	69.1968MHz crystal connected to board
	Out	69.1968MHz crystal isolated from board
LK10	In	44.4MHz crystal connected to board
	Out	44.4MHz crystal isolated from board
LK11	In	5.0688MHz crystal connected to board
	Out	5.0688MHz crystal isolated from board
W2	In	SCSI reset on power fail active
	Out	SCSI reset on power fail inactive
W4	In	19-23890-03 fitted
	Out	19-23890-01 fitted

5.3 INTERNAL CABLES

The following cables are used to interconnect the various modules inside the InfoServer 100 system.

Table 10: InfoServer 100 Internal cables for RRD40 Drives

CABLE	FROM	TO	FUNCTION
17-02909-01	J8	Adaptor Board	SCSI A BUS
17-02909-01	J8	Adaptor Board	SCSI A BUS

Table 11: InfoServer 100 Internal cables for Integrated Cd Drive

CABLE	FROM	TO	FUNCTION
17-02909-01	J8	Integrated CD Drive	SCSI A BUS
17-02909-01	J8	Integrated CD Drive	SCSI B BUS

CHAPTER 6

POWER SUPPLY AND SYSTEM COOLING

6.1 COMPONENT POWER REQUIREMENTS

Table 12 lists the various subsystems and components that compose the Server. Along with the list is the measured/specified power requirements in AMPS for the various items.

6.2 POWER SUPPLY

NSS uses the same power supply as that used in TEAMMATE II server. The power supply supports the following requirements:

1. 194 Watts maximum steady state

2. 300 Watts transient for 1 ms max

3. Fan Speed Control

4. Overtemperature Shutdown

5. Automatic Line Voltage Select (110/220V)

6. Switched AUX outlet†

The power subsystem will not support the following options:

1. Customer Replaceable Fuse

6.3 COOLING

Cooling for ESS will be provided by two variable speed DC fans.

Table 12: Current Requirements Of ESS Components

Item	+5V	+12V	-12V	-9V	
CPU board	TBS	TBS	TBS	TBS	Amps
4 or 8 Mb Memory	1.75	—	—	—	Amps
RZ23 Disk Drive					
–Avg. Operating	.60	.33	—	—	Amps
–Start up surge	—	2.0	—	—	Amps
RRD40 CD Drive	.711	1.0	—	—	Amps
RRD41 CD Drive	.8	.8	—	—	Amps

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† Not used in ESS

CHAPTER 7

RELIABILITY AND SERVICEABILITY

7.1 InfoServer 100 RELIABILITY (PRELIMINARY ANALYSIS)

7.1.1 MTBF Calculations for InfoServer 100

All calculations were computed using:

- PREDIC Version 4.2-0
- Average Temperature rise 15°C
- Default stress Ratio 0.40
- Air speed 300 Ft/min

Component	Temperature	Environment	MTBF
System board	25°C	Ground Fixed	100,748
	40°C	Ground Fixed	66,199
	25°C	Ground Benign	192,951
	40°C	Ground Benign	106,847

Table 13:   InfoServer 100 BASE SYSTEM Reliability data

COMPONENT	MTBF	LAMBDA x 10^{-9}
CPU board (90ns)	192951	5182
RZ23	50000	20000
RRD40	30000	
Power Supply	318820	3136
FANS	47500	21052
SYSTEM TOTAL†		

† This value will decrease as more system components are added

7.2 SERVICEABILITY

The following subsystems and modules will be field replaceable (FRU) in the InfoServer 100:

Power Supply/Fan Assembly
CPU board KA41-CA
Memory Option Board

All Storage Devices

CHAPTER 8

TESTING AND PRODUCT EVALUATION

This section lists design standards and regualtions. For detail product assurance testing, please refer to InfoServer 100 Qualification Test Plan.

8.1 DIGITAL HARDWARE DESIGN STANDARDS

InfoServer 100 will conform to the following DEC Standards:

1. DEC STD 002 -AC Power Wiring, Grounding, Receptacle and Electrical Rating Information Requirements

2. DEC STD 032 -VAX Architecture Standard

3. DEC STD 052 -Operational Requirements for Asynchronous, Full Duplex, Serial Terminals and System Interfaces Operating As DTEs Connected To EIA RS-232-C and CCITT V.28 Point-To-Point Modems

4. DEC STD 102 Class, -Environmental Standard For Computers.

5. DEC STD 103 Class A -Electromagnetic Compatibility (EMC) - Hardware Design Requirements

6. DEC STD 104 -Product Acoustic Noise Acceptability (Open Office)

7. DEC STD 119 -Digital Product Safety

8. DEC STD 122 -AC Power Line Standard

9. DEC STD 134 -The Digital Ethernet Specification

10. DEC STD 178-3 -Digital Marking Requirements for Completed Products Interested to be sold

8.2 EXTERNAL REGULATIONS AND STANDARDS

NSS will conform to the requirements of external regulations and standards listed below:

1. CEE 22.6 -Specification for appliance Couplers for Domestic and Similar General Purposes

2. CSA C22.2 No. 220-M1986 Information Processing and Business Equipment

3. FCC Part 15J Level A -Federal Communications Commission (Commercial)

4. IEC 380 -Standard For The Safety of Electrically-Energized Office Machines

5. IEC 435 -Safety Requirements For Data Processing Equipment

6. UL STD 478 5th Edition -Information Processing and Business Equipment

7. VDE 0806 -Regulations For Office Machines

8. VDE 0871 Level B -Radio Interference Suppression of Radio Frequency Equipment For Industrial, Scientific, and Medical, and Similar Purposes

9. GSmark

APPENDIX   A

SPECIFICATION TABLES

Table 14:   Physical Specifications

ENGINEER	PRODUCT	APPLICABLE VARIATIONS	DATE
	NSS	__ | __ | __ | __ | __ | __ | __	

PARAMETER	MIN	TYP	MAX	UNITS	SYMBOL
Height	--	14.99	--	centimeters	cm
	--	5.90	--	inches	in
Width	--	46.38	--	centimeters	cm
	--	18.26	--	inches	in
Expansion Width	--	N/A	--	centimeters	cm
	--	N/A	--	inches	in
Depth	--	40.00	--	centimeters	cm
	--	15.75	--	inches	in
Weight	--	20.50		kilograms	kg
	--	45.00		pounds	lb
Shipping Height	--	54.00	--	centimeters	cm
	--	21.26	--	inches	in
Shipping Width	--	62.70	--	centimeters	cm
	--	24.69	--	inches	in
Shipping Depth	--	51.00	--	centimeters	cm
	--	20.00	--	inches	in
Shipping Weight	--	22.73	--	kilograms	kg
	--	50.00	--	pounds	lb

Table 14(Cont.): Physical Specifications.

PARAMETER	MIN	TYP	MAX	UNITS	SYMBOL
front	20.3	--	--	centimeters	cm
Operation Clearance	8.0	--	--	inches	in
rear	10.2	--	--	centimeters	cm
	4.0	--	--	inches	in
left side	5.1	--	--	centimeters	cm
	2.0	--	--	inches	in
right side	5.1	--	--	centimeters	cm
	2.0	--	--	inches	in
Data Cable (for terminal use)	Type	BC16E-25	Length	7.62	m
				300	in

Table 15: Environmental Specifications

ENGINEER	PRODUCT	APPLICABLE VARIATIONS	DATE
	NSS	__|__|__|__|__|__|__|__|	

PARAMETER	MIN	TYP	MAX	UNITS	SYMBOL
Temperature (Operating)	10	--	32	degrees Celsius	oC
	50	--	90	degrees Fahrenheit	oF
Temperature (Nonoperating)	-40	--	66	degrees Celsius	oC
	-40	--	151	degrees Fahrenheit	oF
Temperature (Storage)	5	--	50	degrees Celsius	oC
	41	--	122	degrees Fahrenheit	oF
Temperature Rate of Change (Operating)	--	--	11	degrees Celsius per hour	oC/h
	--	--	20	degrees Fahrenheit per hour	oF/h
Relative Humidity (Operating)	10	--	80	percent relative humidity (non-condensing	%RH
Relative Humidity (Nonoperating)	10	--	95 @66C	percent relative humidity	%RH
Relative Humidity (Storage)	10	--	95	percent relative humidity (non-condensing	%RH

Table 15(Cont.): Environmental Specifications.

PARAMETER	MIN	TYP	MAX	UNITS	SYMBOL
Maximum Wet Bulb Temperature (Operating)	--	--	28	degrees Celsius	oC
	--	--	82	degrees Fahrenheit	oF
Maximum Wet Bulb Temperature (Storage)	--	--	32	degrees Celsius	oC
	--	--	90	degrees Fahrenheit	oF
Minimum Dew Point Temperature (Operating)	2	--	--	degrees Celsius	oC
	36	--	--	degrees Fahrenheit	oF
Heat Dissipation	--	155	240	watts	W
	--	TBD	TBD	Btu/h	Btu/h
Air Flow	--	0.019	--	cubic meters per second	M3/S
	--	40	--	cubic feet per minute	ft3/min
Airflow Intake and Exhaust Location	Intake Location	Left side	Exhaust Location		Right side
Altitude (operating)	--	--	2400	meters	m
	--	--	8000	feet	ft

Table 15(Cont.): Environmental Specifications.

PARAMETER		MIN	TYP	MAX	UNITS	SYMBOL
Altitude (Nonoperating)		--	--	4900	meters	m
		--	--	16000	feet	
Mechanical Shock (Operating)	Duration			10	milliseconds	ms
	Level			10	gravities	g
Vibration (Operating)	Freq. Range			500	hertz	Hz
	Vibra. Level			0.25		
Mechanical Shock (Nonoperating)	Duration			100	milliseconds	ms
	Level			50.00	gravities	g
Vibration (Nonoperating)	Freq. Range		50		hertz	Hz
	Vibra. Level		0.02		g(sqrd)/Hz	g^2Hz
Acoustics	Operating LNPE	--	4.9	--	Bels	B
	LPA	--	38	--	Decibels	dBA
	Idle LNPE	--	5	--	Bels	B
	LPA	--	41	--	Decibels	dBA

Table 16: Ac Input Power Specifications

ENGINEER	PRODUCT	APPLICABLE VARIATIONS	DATE
	NSS		
		__ | __ | __ | __ | __ | __ | __ | __	

PARAMETER	MIN	TYP	MAX	UNITS	SYMBOL
Voltage Nominal	--	110 /220	--	volts	V
Voltage Design Range	88 176	--	132 264	volts	V
Frequency Nominal	--	50/60	--	hertz	Hz
Frequency Range	47	--	63	hertz	Hz
Number of Phases	--	1	--	none	NA
RMS Current Phase A (Steady State)	--	1.7 @120V	TBD	amperes	A
Phase A	--	1.0 @240	--	amperes	A
Neutral N	--	1.7 @120V	--	amperes	A
Neutral N	--	1.0 @240V	--	amperes	A
Ground G	--	750	--	milliamperes	mA

Table 16(Cont.): Ac Input Power Specifications.

PARAMETER	MIN	TYP	MAX	UNITS	SYMBOL
Peak Current Phase A (Steady State)	--	6.3 @120V	TBD	amperes	A
Phase B	--	N/A	N/A	amperes	A
Phase C	--	N/A	N/A	amperes	A
Neutral N	--	6.3 @120V	TBD	amperes	A
Ac Plug Type	C14				
Ride-through Time	10			millisecond	ms
Initial Inrush Current	--	--	45	amperes peak	A
Start-up Current Amplitude	--	--	6.0	rms amperes	A

Table 16(Cont.): Ac Input Power Specifications.

PARAMETER		MIN	TYP	MAX	UNITS	SYMBOL
Start-up Current Duration		--	--	12	seconds	s
Power Consumption		--	160	230	watts	W
Apparent Power		--	264	380	volt amperes	VA
Dc Output Watts Available		--	--	194	watts	W
122 watt Converter Dc Output Amperes Available at each Dc Voltage	voltage					
	+5.1	--	--	13.0	amperes	A
	+12	--	--	4.0	amperes	A
	-12	--	--	0.5	amperes	A
	-9	--	--	0.2	amperes	A
72 watt converter	+5	--	--	7.0	amperes	A
	+12	--	--	3.0	amperes	A
Fuse or Circuit Breaker Rating		--	5	--	amperes	A
Power Factor		--	0.6	--	none	PF
Crest Factor		--	2.8	--	none	CF

Table 17:   EMS Specifications

ENGINEER	PRODUCT	APPLICABLE VARIATIONS	DATE
	NSS		
		__|__|__|__|__|__|__	

Broadband Conducted EMI	TBD	Volts		
Narrowband Conducted Transients	Frequency Range	TBD		
	V rms into 50 ohms	TBD		
Narrowband Radiated	Frequency Range	TBD		
Susceptibility	Level (V/m)	TBD		
ESD Control		TBD	UNITS	SYMBOL
		TBD	kilovolt	kV

APPENDIX B

CONNECTOR DETAILS

Table 18:   External SCSI Connector, 50 way Champ

Pin	Signal	Pin	Signal
1	Ground	26	-DB<0>
2	Ground	27	-DB<1>
3	Ground	28	-DB<2>
4	Ground	29	-DB<3>
5	Ground	30	-DB<4>
6	Ground	31	-DB<5>
7	Ground	32	-DB<6>
8	Ground	33	-DB<7>
9	Ground	34	-DB<P>
10	Ground	35	Ground
11	Ground	36	Ground
12	Ground	37	Ground
13	NOT CONNECT	38	TERMPWR
14	Ground	39	Ground
15	Ground	40	Ground
16	Ground	41	-ATN
17	Ground	42	Ground
18	Ground	43	-BSY
19	Ground	44	-ACK
20	Ground	45	-RST
21	Ground	46	-MSG
22	Ground	47	-SEL
23	Ground	48	-C/D
24	Ground	49	-REQ
25	Ground	50	-I/O

Table 19:   SCSI/SCSI Connector J8 On The CPU board

J902		J902	
Pin	Description	Pin	Description
1	Ground	51	Ground

Table 19 (Cont.):   SCSI/SCSI Connector J8 On The CPU board

Pin	Description	Pin	Description
2	SC1B<0>	52	SC2B<0>
3	Ground	53	Ground
4	SC1B<1>	54	SC2B<1>
5	Ground	55	Ground
6	SC1B<2>	56	SC2B<2>
7	Ground	57	Ground
8	SC1B<3>	58	SC2B<3>
9	Ground	59	Ground
10	SC1B<4>	60	SC2B<4>
11	Ground	61	Ground
12	SC1B<5>	62	SC2B<5>
13	Ground	63	Ground
14	SC1B<6>	64	SC2B<6>
15	Ground	65	Ground
16	SC1B<7>	66	SC2B<7>
17	Ground	67	Ground
18	SC1PR	68	SC2PR
19	Ground	69	Ground
20	Ground	70	Ground
21	Ground	71	Ground
22	Ground	72	Ground
23	Ground	73	Ground
24	Ground	74	Ground
25	OPEN	75	OPEN
26	TERMPWR1	76	TERMPWR2
27	Ground	77	Ground
28	Ground	78	Ground
29	Ground	79	Ground
30	Ground	80	Ground
31	Ground	81	Ground
32	SC1ATN	82	SC2ATN
33	Ground	83	Ground
34	Ground	84	Ground
35	Ground	85	Ground
36	SC1BSY	86	SC2BSY
37	Ground	87	Ground
38	SC1ACK	88	SC2ACK
39	Ground	89	Ground

Table 19 (Cont.):   SCSI/SCSI Connector J8 On The CPU board

Pin	Description	Pin	Description
40	SC1RST	90	SC2RST
41	Ground	91	Ground
42	SC1MSG	92	SC2MSG
43	Ground	93	Ground
44	SC1SEL	94	SC2SEL
45	Ground	95	Ground
46	SC1C/D	96	SC2C/D
47	Ground	97	Ground
48	SC1REQ	98	SC2REQ
49	Ground	99	Ground
50	SC1I/O	100	SC2I/O

Table 20:   Power Supply Connector On The CPU board (J14)

J10		J10	
Pin	Description	Pin	Description
1	-12v	8	+5v
2	Ground	9	+12v
3	Ground	10	+5v
4	Ground	11	Ground
5	+5v	12	Ground
6	+5v	13	-9v
7	DCOK H	14	-9v RET

Table 21:   Memory Board Option Connectors On CPU board (J7 And J12)

J13		J14	
Pin	Description	Pin	Description
1	CAS1 L	1	DPAR2 H
2	CAS0 L	2	DPAR3 H
3	Ground	3	Ground
4	BRAS7 L	4	Ground
5	ADDR05 H	5	BDAL31 H
6	ADDR02 H	6	BDAL30 H
7	ADDR03 H	7	BDAL29 H
8	ADDR00 H	8	BDAL28 H
9	ADDR01 H	9	+5v
10	MSIZE2 L	10	BRAS4 L

Table 21 (Cont.): Memory Board Option Connectors On CPU board (J7 And J12)

Pin	Description	Pin	Description
11	BMDIR H	11	BDAL27 H
12	XBLOENA L	12	BDAL26 H
13	BRAS1 L	13	BRAS5 L
14	BRAS3 L	14	+5v
15	Ground	15	BDAL25 H
16	BDAL14 H	16	BDAL24 H
17	BDAL15 H	17	Ground
18	BDAL12 H	18	BDAL22 H
19	BDAL13 H	19	BDAL23 H
20	BDAL10 H	20	BDAL20 H
21	BDAL11 H	21	BDAL21 H
22	BDAL08 H	22	BDAL18 H
23	BDAL09 H	23	BDAL19 H
24	Ground	24	BDAL16 H
25	BDAL07 H	25	BDAL17 H
26	BDAL06 H	26	Ground
27	+5v	27	XBHIENA L
28	MSIZE0 L	28	BRAS2 L
29	BDAL05 H	29	BWRITE L
30	BDAL04 H	30	+5v
31	MSIZE1 L	31	+5v
32	+5v	32	ADDR08 H
33	BDAL03 H	33	ADDR09 H
34	BDAL02 H	34	ADDR06 H
35	BDAL01 H	35	ADDR07 H
36	BDAL00 H	36	ADDR04 H
37	Ground	37	BRAS6 L
38	Ground	38	Ground
39	DPAR0 H	39	CAS3 L
40	DPAR1 H	40	CAS2 L

APPENDIX   C

REFERENCE DOCUMENTS

Additional detailed architectural and design information is available in the following specifications:

1. DEC STD 002 AC Power Wiring

2. DEC STD 032 VAX Architecture Standard

3. DEC STD 052 Serial Terminals and Serial System Interfaces

4. DEC STD 102 Environmental Standard

5. DEC STD 103 Electromagnetic Compatibility

6. DEC STD 104 Acoustic Noise Acceptability

7. DEC STD 119 Product Safety

8. DEC STD 122 AC Power Line Standard

9. DEC STD 134 DEC Ethernet Specification

10. DEC STD 178 Digital Marking Requirements For Products

11. KA41 CPU board Specification

12. KA41 System Firmware Specification

13. RZ23 Disk Drive Specification

14. MS42-AA 4 Mbyte Memory

15. MS42-BA 12 Mbyte Memory

16. TEAMMATE-II Diagnostics Specs

17. RRD40 Specification

18. InfoServer 100 Qualification Test Plan

19. InfoServer 100 Field Test Plan