voyager IIi

Technical White Paper

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Tadpole rdi

Portable Unix Workstation and Servers for a Mobile World

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1. VoyagerIIi Overview

1.1 Introduction

This document describes the Tadpole-RDI VoyagerIIi. The VoyagerIIi packages all the power and functionality of a SUN Ultra 10 into a robust, mobile package measuring 12.7" x 10.2" x 4.0" (323mm x 259mm x 101mm), weighing around 10 lbs (4.5kg). The unit includes user exchangeable, robust, disk packs with maximum capacity of 32GB. Support for the Solaris 2.5.1, 2.6 and 7 operating environments allow the VoyagerIIi to run all major SPARC/Solaris applications.

The VoyagerIIi product is designed for Mobile Technical Professionals who need to develop, demonstrate or deploy, Solaris applications at more than one location. The VoyagerIIi is a robust, portable, 100% SPARC compliant, full powered Ultra-IIi server or desktop platform. It provides the user with the ability to run any of the 10,000 plus Solaris applications - at home, office or other locations.

The VoyagerIIi can be configured with 360MHz ULTRA-IIi processing power, up to 1GB DRAM, up to 32GB of internal, removable hard disk capacity, allowing the user to deploy and not just demonstrate any Server or Desktop application without compromise. The user exchangeable disk packs also make field distribution of binaries, demonstrations or pre-built applications a straightforward, error free task. Also the exchangeable disk packs enable the user to switch between demonstration, training, or testing environments in minutes.

The VoyagerIIi can be easily carried between sites, has technology designed for portability, robustness and security, and delivers 100% power and functionality compatibility for fully deployable systems.

1.2 Target Markets and Applications

Any company developing, selling or utilizing applications on the SUN platform (SPARC/Solaris). The user will have a portable/mobile requirement, e.g. a multi-location worker.

Feature	Benefit
Full SUN UltraSPARC-IIi functionality	Runs any SPARC/Solaris application, at 100% power and functionality.
Weight around 10 lbs.	Can be easily transported between office, customer site, home office and other locations.
Internal, removable hard disks of total capacity up to 32GB	User can quickly swap between different environments, e.g. Trainer :- Different courses. SE :- Different demonstrations.
	Can always return to known working system.
	Multi-purpose:- Switch between multiple personal, demo, or test environments within minutes. Increasing system utilization by using unit for different purposes.
	Disks removable for security of data.
	Disks lockable for security of data.

	Choose between striped, parallel or mirrored disks depending on performance requirements.
Can be carried in hand luggage	Reduced shipping costs. Reduce the time the system is out of use - i.e. no need for packing and shipping in advance. Save time in packing up and arranging shipping. Save time in set up/finding equipment.

Use	**Key features/benefits**
SE for Demonstration	Increased sales/demonstration productivity. Reduced shipping costs. Controlled, consistent, demonstration environments.
Training	Fast set up. Lower shipping costs. Higher system utilization.
Show/Exhibition Demonstration	Reduced shipping costs. Controlled demonstration environment. Disk packs lockable or removable for security.
Developer	Fully compliant SPARC/Solaris system for UNIX/Java development. Single system with multiple personalities via removable hard disks for :- Benchmarking, working at home, working in office, working at customer site.
Consultant	Fully compliant SPARC/Solaris system. Single system with multiple personalities via removable hard disks for :- network management, data collection and analysis, benchmarking, portable small web server, Javastation/NC concentrator, working at home, working in the office, working on customer sites.
Deployment	Fully compliant, full powered UltraSPARC-IIi system. Portable system for temporary office, mobile command and control, on site data collection and analysis. Mobile disaster recovery, field CAD/CAM deployment, mobile mapping and analysis.

1.3 Hardware Overview

The VoyagerIIi feature include the following :-

- UltraSPARC-IIi CPU module (upgradeable)
- Up to 1GB of memory using industry standard DRAMs
- Up to two user-removable custom disk packs. Each disk pack contains one or two 2.5" Ultra-IDE HDD. Each disk has it's own high-performance disk controller. Each controller provides a 33MByte/sec Ultra-DMA interface to each disk, and a 133MByte/sec (peak) DMA interface to main memory.
- Up to 2MB of 2nd level CPU cache.
- Ultra-SCSI external interface.
- 10/100 Base TX network interface.

- Dual PC-Card slots to support CardBus (32 bit) and PCMCIA (16 bit) devices. Two type I/II cards, or one type III card may be fitted.
- Single PCI expansion slot, accommodates a range of PCI half-cards.

A modular design allows the CPU module, disk drives, graphics capability and system memory to be easily exchanged or upgraded.

1.4 Operating System Support

VoyagerIIi products are shipped preloaded with SunSoft's Solaris 2.6 Operating System. This is available in two options - Server and Desktop. The Server implementation is a superset of the Desktop, and provides additional functionality such as enhanced PPP, advanced administration and backup S/W, and disk management suite. The option of Solaris in Desktop or Server formats, shipped with the VoyagerIIi product will be user defined by the main usage of the machine. Solaris 2.5.1 and 7 are available but won't be preloaded.

1.5 Security

Disks

- Disk packs may be removed for secure storage
- Kensington Lock (optional)
- Disk packs may be secured to main unit to prevent unauthorized removal

2. Technical Specification

Processor	360MHz UltraSPARC-IIi module
Cache	High-speed 2nd-level cache 2MB
Memory	256MB up to 1GB
I/O	66MHz 32-bit PCI I/O bus,
	2 x 33 MHz 32-bit PCI buses (simultaneous activity)
Disks	4 x Ultra-DMA IDE disk channels (simultaneous activity)
	2 x removable disk packs each with capacities up to 16GB
Networking	10/100 Base T interface (auto-sensing)
PCMCIA/CardBus	Two type I/II cards, or one type III
Graphics	PGX 32 8bit and 24 bit graphics solution
PCI	PCI expansion slot for graphics or specialist I/O
Misc.	2 x RS232 serial interfaces (Sync/Async)
	Parallel IEEE P1284 compatible Centronics interface
	Keyboard/mouse - Sun and PC
Software	Openboot 3.x, Self-Test and Diagnostics
	Solaris 2.5.1 Desktop
	Solaris 2.6, 7 Desktop or Server Options
Configuration	US/English for North American and International markets
SCSI	Ultra SCSI (40 MB/s) on a 68-way SCSI-3 socket
Audio	Internal: beeper, basic PC card audio support (e.g. modem call progression)
Internal Mains PSU	World standard; mains inlet, switch and fuse
Standards/Approvals	N. America: UL (safety), FCC* Part 15 Class B (EMC)
	Europe: CE98 includes EN 60950 (Safety), EN55022 (Emissions),
	EN 50082-1 (Immunity)
Dimensions	12.7 x 10.2 x 4.0 inches (323 x 259 x 101mm)
Weight	Circa 10 lbs. (4.5kgs)
Temperature	Operating: 5 to 35 degrees C
	Non-Operating: -20 to 50 degrees C
Humidity	Operating: 8 to 80% non-condensing
	Non-Operating: 5 to 95% non-condensing

3. System Architecture
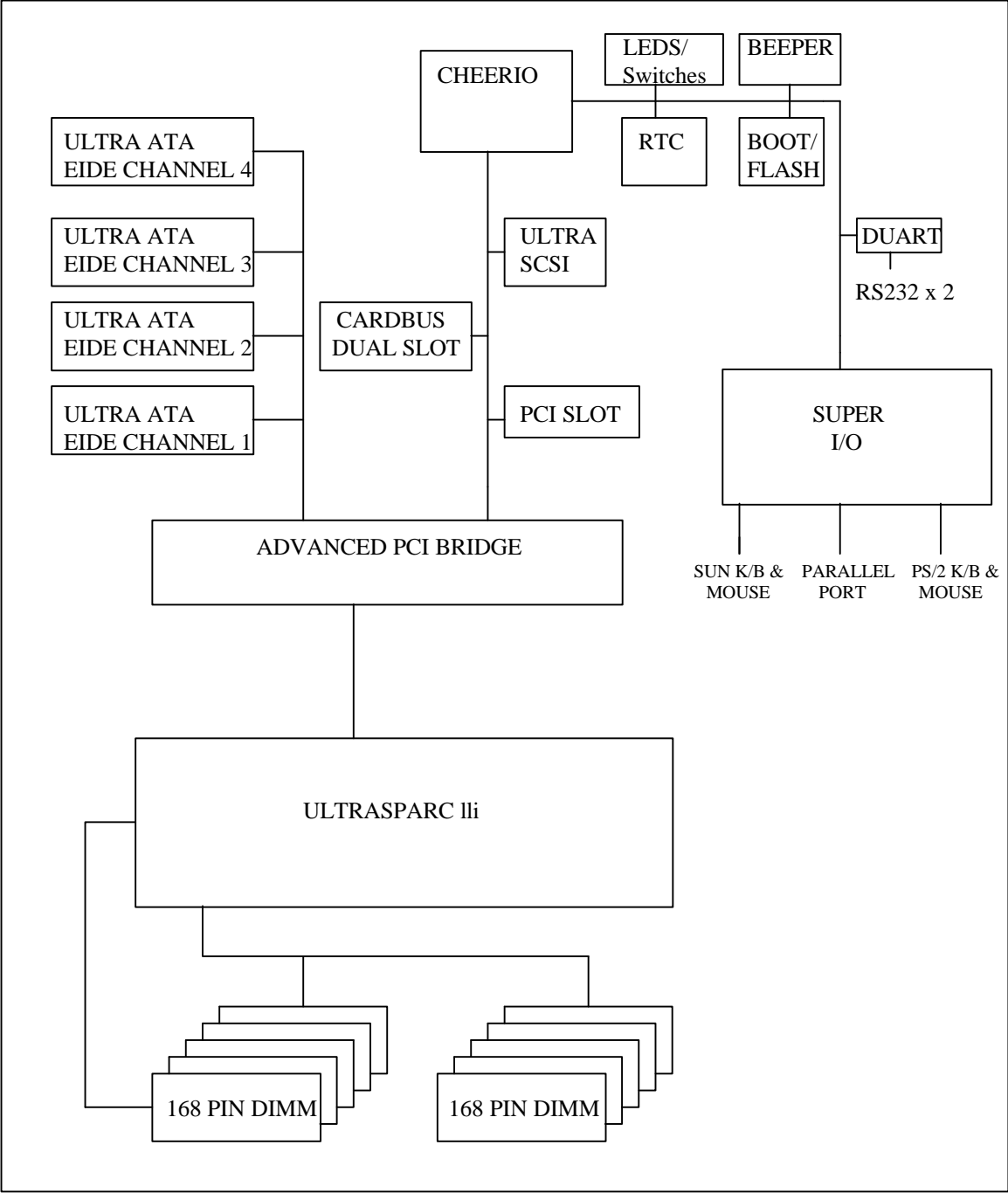
The figure contains a block diagram of the VoyagerIIi hardware architecture.

3.1 Processor Module

The processor in the VoyagerIIi is the UltraSPARC IIi developed by Sun Microelectronics. This is based on the 2nd-generation SPARC V9 architecture, and is an integrated and speed tuned version of the UltraSPARC 2 chip set. A number of different speed grades of processor will be available during the VoyagerIIi product lifetime. The VoyagerIIi was initially available at 300MHz and had a benchmark performance of approximately 12.1 SPECint95 and 12.9 SPECfp95. The VoyagerIIi is available now with a 360MHz processor which has a benchmark performance of approximately 15.2 SPECint95 and 19.9 SPECfp95.

The processor is of superscalar architecture (i.e. has multiple execution units which operate simultaneously), and can execute instructions at a sustainable rate of 4 instructions per clock - i.e. 1.2 giga-instructions per second at 360MHz. In order to feed the various processing elements at this rate, the processor features two on-chip 16kbytes primary caches for instruction and data storage. These support the (approximate) 5 GigaByte per second instruction rate required to feed the various execution units.

The UltraSPARC IIi processor has three busses for connecting to the system resources. These are the 2nd-level (L2) cache bus, DRAM bus and I/O bus.

The L2 cache is connected directly to the processor via a dedicated bus. This ensures that the cache performance is not compromised by any conflicting needs for the main memory or I/O. In fact, transfers can occur on the L2 bus simultaneously with activity on the other busses. The L2 cache bus supports a data transfer rate of around 1.2GB/s.

In the VoyagerIIi product, the CPU is part of a module assembly manufactured by Sun Microelectronics. This integrates the IIi processor and the L2 cache in a tightly coupled arrangement. This modular approach ensures that the L2 cache, which has a critical influence on system performance, is tuned for a particular processor price/performance point. Initial versions of the UltraSPARC-IIi module supported 512KB of L2 cache with a 300MHz CPU. The 360MHz UltraSPARC-IIi module now provides 2MB of L2 cache.

3.2 Main Memory (DRAM)

The DRAM bus connects the IIi processor module to the main system memory. The IIi module provides a 64bit wide interface, but external routing/multiplex hardware converts this to 128bits for connection to the DRAM. This 2:1 conversion effectively doubles the DRAM bandwidth to achieve a 400MB/s rate at the module interface.

The VoyagerIIi memory is based on Dual In-line Memory Modules (DIMMs). 8 DIMM sockets are provided, supporting a wide range of memory configurations and allowing progressive upgrade to a total memory capacity of 1GByte. Each DIMM supports a 64bit data path, which means that DIMMs are fitted in matched pairs to provide the necessary 128bit data width.

The DRAM memory has ECC protection. This allows the detection of memory problems and supports multiple bit error detection and single bit error correction. Memory failures in DRAM devices can be caused by alpha particle strikes, which, whilst not common, may be sufficiently significant to cause concern in some applications. The ECC arrangement allows the VoyagerIIi system to cope transparently with such failures (i.e. correct the problem without affecting the application). The ECC is implemented via an 8bit syndrome extension to each 64bit data value; i.e. a total of 9 bytes of memory are used for each 8 bytes of data. Each DIMM therefore provides a total storage width of 72bits (64bit data + 8bit ECC).

3.3 I/O Bus Architecture

The third processor bus is for I/O connectivity. This is a double-speed PCI interface, and supports data transfer rates in excess of 200MB/s. In the VoyagerIIi design, a Sun Advanced PCI Bridge (APB) device is

used to convert this bus into two "standard" 33MHz PCI busses. Each of these busses is fully independent, and supports transfer rates > 100MB/s.   The APB provides sufficient bandwidth to support high simultaneous loading on the two busses - i.e. up to the 200MB/s supported by the processor.

In the VoyagerIIi design, one of the PCI busses is used exclusively for the disk sub-system (see later). The second PCI bus supports all of the other I/O devices - network, graphics option, expansion I/O, etc., In this respect, the VoyagerIIi effectively has double the I/O bandwidth of a traditional desktop machine, and supports extremely high levels of disk transfer bandwidth simultaneously with "normal" I/O.

3.4 PCI Card Expansion

The main I/O bus supports a PCI expansion slot. This slot could be used for a number of different applications, but it is most likely to provide the (optional) graphics support. This slot physically supports cards with sizes up to, and slightly larger than the PCI "half card" format. This allows a potentially wide range of products to be supported as card manufacturers increase the availability of SPARC/Solaris device drivers .

In practice the PCI slot will be used to support the range of cards specifically qualified by Tadpole-RDI for the VoyagerIIi application. However, the utilization of a reasonably generic PCI format should allow items to be added to the "supported" list as genuine requirements arise.

3.5 PCMCIA/CardBus

The VoyagerIIi provides two CardBus slots supporting further I/O expansion. These sockets accept PCMCIA (16bit) or CardBus (32bit) expansion card devices. Both cards have the same physical characteristics - i.e. a robust, credit card format. However, the CardBus standard is a newer "superset" of the older PCMCIA standard, and supports far higher data transfer rates to the expansion card.

The CardBus interface is supported by a Texas Instruments PCI 1250A CardBus controller device which resides on the main I/O bus. This provides high-bandwidth support, including DMA, for the expansion cards. The CardBus standard allows data transfer rates of up to 133MByte/s to the expansion cards, which means that this interface can be used for high bandwidth applications - e.g. additional 100MBit networks, ATM, docking station expansion, etc.

3.6 SCSI

The Ultra SCSI interface is provided by a Symbios SYM 53C875 SCSI controller. This provides a 16bit SCSI-3 "Fast-20" interface (i.e. 20MHz), capable of supporting SCSI-1, 2 or 3 devices. In combination with 16bit SCSI-3 devices this interface supports sustained data transfer rates up to 40MB/s. The SCSI interface is likely to be used for loading or back-up of system software, or for connection to additional disk storage.

3.7 Networking

The network interface is an auto-sensing 10/100Mbit Ethernet. This is provided by the Sun "Cheerio" device. The network physical layer (PHY) is CAT5 unshielded twisted pair.

3.8 Miscellaneous Items

The Sun Cheerio, which provides the Ethernet controller, also provides a bridge between the high-speed PCI bus and a lower speed 8 bit bus which supports a number of miscellaneous items. These include the Boot ROM, Real Time Clock (RTC), battery backed RAM, Serial I/O, Keyboard, Mouse and Parallel interfaces.

The keyboard, mouse and parallel interfaces are supported by a Super-I/O device. Two keyboard and two mouse channels are provided so that Sun or PC standard peripherals can be connected. The parallel interface is an IEEE 1284 style (i.e. Centronics), which supports industry standard printer devices.

The Boot ROM, which is based on the Sun OpenBoot standard, resides in Flash ROM. This can be field upgraded. The ROM based code also supports Power-On Self Test (POST) for self testing and diagnostics support.

An RTC/RAM device provides a real-time clock and 8kbytes of battery backed up RAM.

A Siemens 82532 Enhanced Serial Communications Controller (ESCC) provides two RS232 serial interfaces. These interfaces feature 4 wire handshaking plus various clocks to support a range of asynchronous or synchronous transfer modes.

3.9 The Disk Architecture

A key design objective for the VoyagerIIi was to create a disk infrastructure of high capacity and high performance, while also sufficiently compact and robust to meet the needs of a mobile product.

The VoyagerIIi uses 2.5" disk technology which is smaller, lighter, consumes less power, and is dramatically more resilient than 3.5" alternatives. These are all key advantages for a mobile application.

To achieve performance targets, the solution adopted in the VoyagerIIi product is to use multiple 2.5" drives in a fully parallelized configuration.

The VoyagerIIi supports four 2.5" disk drives via four disk controller devices. This allows fully concurrent operation - i.e. an operation on any of the disk "channels" is completely separate from the activity of any of the other channels. This allows fully independent, or parallelized activities, and means that the total disk capacity and media rate available is four times the capability of an individual disk item. This is a proven arrangement within the high-performance server market where multiple 3.5" drives are combined to meet the very highest capacity, reliability and performance demands. However, the implementation of four 2.5" drives with separate controllers in a mobile product adds the benefit of being lighter, lower power, smaller and more resilient.

The VoyagerIIi implementation further benefits from using the latest high-density 2.5" hard drives with Ultra-DMA interface technology. This is supported with high-performance Ultra-DMA control devices which jointly reside on a dedicated I/O bus. The combination ensures that more than enough bandwidth exists to support the four drives even when they are all working at peak transfer rates.

The net result of this configuration is a disk sub-system with the following characteristics -

Disk capacity	32GB	total capacity with 4 x 8GB disk drives
Media rate	>20MB/s	typical combined rate
Interface bandwidth	133MB/s	combined peak bandwidth
Size	30 cu in	
Weight	1.6lbs	
Resilience	100G / 400G	operational/non-operational shock
Power	10W	typical

The physical implementation combines pairs of the raw disk drives in an anti-shock mounting within a robust, removable enclosure. The resulting disk "packs" are a resilient arrangement with convenient size and weight characteristics. Including the packaging, each disk pack measures approximately 1.5" x 3.3" x 4.5", and weighs about 1lb. (Note that each pack is lighter and smaller than a single unpackaged 3.5" drive, but offers

more capacity, performance and resilience). The removable packs allow simple reconfiguration of the VoyagerIIi storage and allows software upgrades, etc., to be shipped between different locations.

The advanced capabilities of the disk arrangement can be utilized in a number of different ways according to the needs of a specific application.

In some instances, where very large file systems are managed and data is moved in large blocks (e.g. in data logging/processing), the data can be "striped" across the disk drives to achieve very high sustained block transfer rates (i.e. at the combined media rate of around 20MB/s). In other instances, where multiple file systems are required and are used concurrently (e.g. database applications), these can be configured on the different drives to allow parallel access to the different files. Finally, in "mission critical" situations where extremely high reliability is required (e.g. mobile command and control), mirroring software can be used to exploit the "redundancy" of the multiple drives to ensure the highest levels of data integrity/availability. These various arrangements (and others) may be configured via the Solaris operating system software.

The end result is a powerful solution achieving high performance levels and meeting the specific needs of the mobile market - i.e. resilient, compact and lightweight. Furthermore through the powerful capabilities of the Solaris operating system software the flexibility of the arrangement can be exploited to meet the best needs of different applications.

4. Description of Key Components

The main components utilized in the VoyagerIIi products include the following:

COMPONENT	FUNCTION
360 MHz UltraSPARCIIi-I CPU module	Processor
NCR 89C100 MACIO	SCSI Controller Ethernet Controller
IEEE P1284 "Centronics" parallel interface	Parallel Port
CMD PCI 0646U.	Disk Controller
Symbios SYM 53C875.	SCSI Interface
Sun STP 2003.	Network Expansion (10/100 base TX interface)
Texas Instruments PCI 1250A.	PC card expansion controller
8GB removable hard disk drive, up to 4	Removable Hard Disk
256/512/1024 MB DIMM Memory	Main Memory
EOS 100W Open Frame VLT100-4000	Power Supply

4.1 CPU Connectivity

The CPU is an UltraSPARC IIi component and provides three main buses. The first bus supports a dedicated high-speed 2nd-level cache and provides data transfer rates of up to 1.2GB/s. The second bus supports the DRAM main memory and provides data transfer rates of up to 400MB/s The third bus supports high-speed PCI I/O and provides data transfer rates of up to 200MB/s.

4.2 Processor/Cache

Sun UltraSPARC IIi CPU and 2nd-level Cache are integrated onto a Sun processor module. This module is currently available in the 360MHz format.

- 360MHz UltraSPARC IIi Processor with 2MB of "fast" cache

4.3 Main memory

The main memory is arranged as 128bit data plus 16bit ECC by using 72bit DIMMs fitted in pairs. External bus exchange logic converts this into a 72bit pathway to connect with the processor module. The product features 8 x 168pin DIMM sockets arranged in 4 "pairs". This provides total memory configurations up to 1GB (using 8 x 128MB DIMMs). The DIMMs are 3.3V 72bit 60nS EDO and use TSOP memory.

4.4 I/O Architecture

The processor provides a 66MHz 32bit PCI I/O bus. This is split by a Sun APB component to provide two 33MHz 32bit PCI I/O channels. The VoyagerIIi I/O components are distributed on these two buses to provide high sustainable I/O bandwidths.

4.5 Disk

The system supports two user-removable custom disk packs. Each disk pack contains one or two 2.5" 12.7mm/17mm Ultra-IDE HDD items. A range of disk capacities are planned - now up to 8GB/HDD. This provides pack capacities of up to 16GB and system configurations up to 32GB.

4.6 Disk Control

The disk packs are supported via four high-performance disk controllers (i.e. one controller per HDD). Each controller provides a 33MByte/sec Ultra-DMA interface to each disk, and a 133MByte/sec (peak) DMA interface to main memory. Controller type - CMD PCI 0646U.

4.7 SCSI Expansion

An Ultra-SCSI interface is available on the rear of the unit for system expansion. The controller supports a 40MByte/sec Ultra-SCSI interface to external devices and a 133MBytes/sec (peak) DMA interface to main memory. The controller is a Symbios SYM 53C875.

4.8 Network Expansion

A 10/100 Base TX interface is available on the rear of the unit for network expansion. The controller supports 10Mbit and 100MBit network interface (auto-sensing) and a 133MByte/sec (peak) DMA interface to main memory. The controller is a Sun STP 2003.

4.9 CardBus/PCMCIA Expansion

Dual slots are provided to support CardBus (32 bit) and PCMCIA (16 bit) devices. Two type I/II cards, or one type II card may be fitted. The controller supports a 133MByte/s (peak) interface to PC-Card32 devices and a 133MByte/sec DMA interface to main memory. The controller is a Texas Instruments PCI 1250A.

4.10 PCI Expansion

A PCI expansion slot can accommodate a range of PCI half-cards. The cards must have suitable driver software support. (Supported items are covered in Section 5).

4.11 Serial Expansion

2 x RS232 serial interfaces

4.12 Parallel Expansion

IEEE P1284 compatible Centronics parallel interface

4.13 Keyboard/Mouse

PC Keyboard Interface –

- Directly supports an external PS/2 PC keyboard.

PC Mouse Interface –

- Directly supports an external PS/2 PC mouse.

Sun Keyboard/Mouse Interface –

- Directly supports an external Sun keyboard and/or Sun mouse.

4.14 Other

2 x FLASH ROM Sites (up to 512KByte each) for monitor firmware.

1 x MK48T59 32k byte RTC/RAM

Front-panel LEDs for -

- Power-on - system is connected to a power source and is turned on
- POST - system is running a Power-On Self Test
- Run/Stop - system is running Solaris (and shouldn't be turned off), or is stopped in the OpenBoot monitor
- Disk activity (per disk) - indicates a disk is active
- Net activity - indicates the network interface is active
- SCSI activity - indicates the SCSI interface is active

Rear-panel switches for -

- Power-on - switches the mains supply to the unit/peripherals
- Run/Stop - requests unit runs, or stops running, Solaris (enables the unit to be turned off)

Beeper -
Audio sounder indicates various success and failure conditions

Power –

- Mains inlet socket with switch (for unit and peripheral)
- Inline fuse (for unit and peripheral)
- Power supply is autosensing for 110/240V 50/60Hz
- Power requirement mains 100W (typ)

Reset Switch –

- Allows Suspend and Resume function

5. Accessories

5.1 Tadpole-RDI supplied/approved items

> **NOTE:** The accessories on this list are likely to be updated as customer requirements dictate, please contact Tadpole-RDI for latest product information or alternatively check Tadpole-RDI's web site at: www.tadpolerdi.com.

The following items have been certified for compatibility by Tadpole-RDI for use with the VoyagerIIi product, and may be supplied to the VoyagerIIi user by Tadpole-RDI or obtained from another source. *Italics indicates items only available from Tadpole-RDI* :-

PCI Cards	*Sun PGX32 Graphics Card8MB VRAM (8 + 24bit)*
	(24bit colour up to 1280 x 1024), support to 1600 x 1280
PC Card (Modem)	Clippercom 56K Data/Fax Modem
PC Card (LAN)	3COM 3C589 B/C or D (10MB/s)
PC Card (Wireless Modem)	Contact Tadpole-RDI for latest product information
Tape Drive	Contact Tadpole-RDI for latest product information
Floppy Drive	Winstation SLS -120 (120MB)
CD-ROM	Pioneer PCP-PR24 24 Speed portable CD-ROM unit (US only)
	Plextor 40 speed Desktop CD-ROM unit
PC Card (audio, multimedia)	Contact Tadpole-RDI for latest product information
Memory	DRAM - VoyagerIIi DIMM* Pack (based on pairs of industry standard DIMMs).
	* Contact Tadpole-RDI for full technical specification of DIMMS
Disk	*VoyagerIIi Disk Pack*
	(containing up to two 2.5" hard drives).
	VoyagerIIi Unit can contain up to two packs.
Carry Case	*To carry VoyagerIIi product plus compact keyboard and PC notebook CD-ROM drive, and mouse, in a robust, easily hand carried format. FAA approved.*
Disk Security Panel	*glass/perspex front panel, with lockable access to disk packs*
Keyboard	Standard PC Keyboard/ Compact PC keyboard / Sun Keyboard
Mouse	PS/2 Mouse
Flat Panel Display	Contact Tadpole-RDI for latest product information

5.2 Compatible Items

The following items will not be specifically approved or supplied by Tadpole-RDI but are likely to be compatible with the VoyagerIIi product -

- Keyboards - Most PC and Sun keyboards
- Mice - Most PC and Sun mice
- Networking - All 10MBit or 100MBit Base TX network items
- SCSI - Most SCSI items for which suitable driver software exists (e.g. Sun disks)
- Serial - Most serial items for which suitable driver software exists (e.g. modem)
- Parallel - Most parallel items for which suitable driver software exists (e.g. printer)
- Displays - Most third-party monitors, projectors or flat-panel displays. (Note that this depends on the specific PCI graphics card option used).
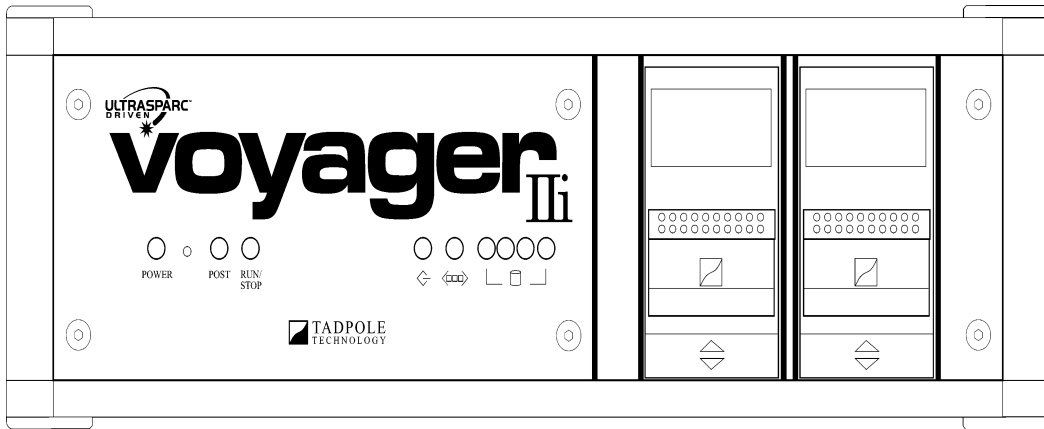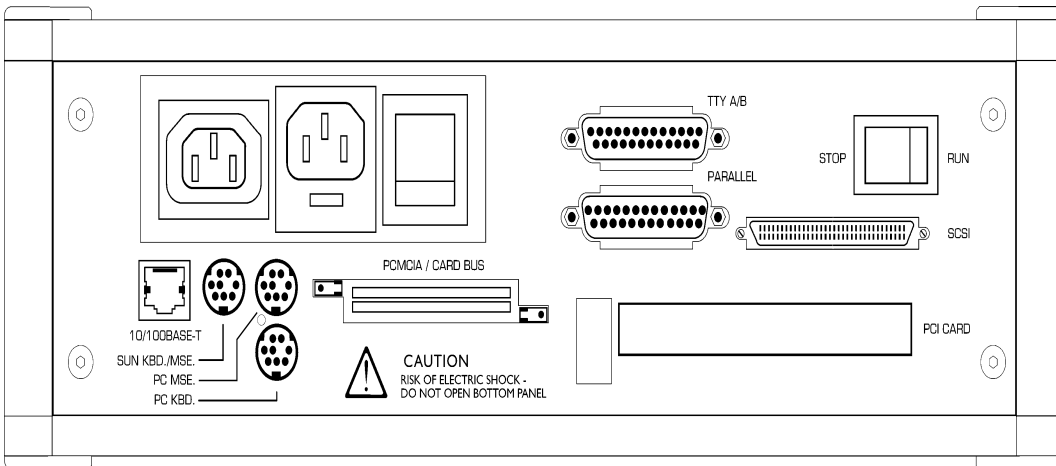
6. I/O Interfaces

Diagram of front panel

Diagram of rear panel

The following connectors are provided on the rear of the VoyagerIIi product -

Name	Description
SCSI Port	Ultra SCSI on a 68-way SCSI-3 (socket)
Ethernet	Interface 10/100 Base TX interface on a RJ45 (socket)
Serial Ports A and B	2 x RS232 interfaces on a 25-way D-Type
Parallel	P1284 interface on a 25-way D-Type (socket)
Keyboard/Mouse	Sun Keyboard/Mouse interface on an 8-way Mini-DIN (socket) PC Keyboard interface on a 6-way Mini-DIN (socket) PC Mouse interface on a 6-way Mini-DIN (socket)
Mains	Inlet on an IEC EN60-320 (plug) Switch (controls mains supply) Fuse

PC Card	Two slots for two Type-I or II, or one Type-III card
Run/Stop	Run/stop switch
PCI Card	One half size (7") slot

7. Standards

7.1 Safety

US	UL	
Canada	CSA C22.2 No. 950	
Europe	CE 98, includes EN 60950	
International	SPARC International	

7.2 EMC

US	FCC Part 15 Class B	
Canada	Accepts US approvals	
Europe	EN 55022 (Emissions)	
	EN 50082-1 (Immunity)	

8. Software

8.1 Operating System

Solaris 2.5.1, 2.6 and 7 are available for the VoyagerIIi.

Solaris 2.5.1 is available in desktop media format only.

Solaris 2.6 and 7 are available in two versions - Server and Desktop. The Server implementation is a superset of the Desktop, and provides the additional functionality required for exploiting the performance capabilities of the parallel disk arrangement, enhance system administration, more flexible connectivity management, etc., For Solaris 2.6 the version of the O/S software shipped with the VoyagerIIi product will be defined by the main usage of the machine - i.e. as a desktop or a server.

8.2 Monitor

The resident boot firmware is based on OpenBoot 3.x. This is stored in FLASH memory, and supports in-system reprogramming. The OBP firmware provides device driver support for the main devices and interfaces.

The OBP firmware is supplemented with POST (Power-On Self Test) and diagnostics software. This is used to check the basic operation of the system during each power-on sequence, and provides assistance in diagnosing any field failures.

8.3 Language variants

The product will be available in US/English language version.

8.4 Test Software

In addition to the items available for customer use, the VoyagerIIi product is also supported by specific software items for manufacturing and service centre support.   These include a low-level monitor routine, and soak-test software (for extended system test and burn-in). These items are not part of the standard product configuration, and are installed onto the system on an as needed basis.

9. System Configurations

The capabilities of the VoyagerIIi product may be changed by configuring the main unit, or by connecting additional items, e.g.

Connectivity via serial port to PC for external console view, no graphics card required

9.1 Shipping Configurations

The VoyagerIIi product will be supplied in a specific configuration defined by -

- Processor speed & cache size (defined by the processor module),
- DRAM capacity (defined by the type and number of DIMMs fitted),
- Disk capacity (defined by the type and number of disk packs),
- PCI card options (defined by the type of PCI card fitted (if any),
- Desktop or Server Solaris Operating System version (defined by VoyagerIIi Desktop or Server options)

9.2 System Upgrades

Changes to the main system configuration (as defined above) can be undertaken as a combination of field upgrade (i.e. by the user) or by returning the unit to an approved service centre. The main upgrade items are critical to the performance of the product and must be purchased through an approved Tadpole-RDI channel:

- The processor module (i.e. processor speed & cache size) can be upgraded as a return to service centre option. Upgrade options will depend on which processor modules are available at the time of upgrade.

- The DRAM is a user changeable item. The upgrade involves purchasing an VoyagerIIi DIMM Pack (two DIMMs) and fitting them in pairs to spare memory slots within the unit. The number of slots which are spare will depend on the initial configuration. This operation requires the use of a screwdriver.

- The disk packs are user changeable items. The upgrade involves purchasing an VoyagerIIi Disk Pack and inserting it into the unit (subject to the availability of a free slot). This is a simple plug/unplug operation. The raw disk drives contained within the disk packs can be upgraded as a return to service centre option.

- PCI cards may be installed/upgraded as a return to service center option.
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Appendix A

The VoyagerIIi is a high performance, robust, portable, fully SPARC compliant, Ultra-IIi server or desktop platform.

Support for the Solaris 2.5.1, 2.6 and 7 operating system allows the VoyagerIIi to run any of the 10,000 plus Solaris applications and with the VoyagerIIi only weighing approximately 10lbs this makes the VoyagerIIi a very versatile system.

The VoyagerIIi is aimed at a variety of markets, but there are two main environments;

In the **Desktop** environment, the VoyagerIIi can show off its ability in running any of the 10,000 plus Solaris applications.

In the **Server** environment the VoyagerIIi will make full use of its 360MHz processing power and up to a 1GB DRAM to run server applications to their full potential.

The VoyagerIIi is also designed to be upgradable when more powerful generations of UltraSPARC processors become available, larger capacity disks and more powerful graphics will undoubtedly be available in the future.

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About Tadpole-RDI

Tadpole-RDI, a subsidiary of Tadpole Technology Plc, is the global leader in the design and manufacture of portable UNIX workstations and server systems for Sun and Hewlett-Packard environments. Its North American headquarters are based in Carlsbad, California and European operations in Cambridge, England. Tadpole-RDI is certified ISO-9001 and operates through a global network of specialist distribution channels providing applications in industry, commerce and government. Tadpole-RDI can be visited at www.tadpolerdi.com.

About Tadpole Technology Plc

Tadpole Technology is a listed company on the London Stock Exchange and also pioneer of mobile Java solutions called Cartesia for the world's utilities and related industries. Leveraging developments in Java and intranet technology, Cartesia brings the full advantages of integrated corporate workflow to the mobile environment allowing utilities to deploy the first set of truly location-independent, platform-neutral business tools that generate reductions in IT costs and gains in mobile workforce productivity.