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**CONVEX**  
**Service Plan for**  
**CLARiiON 2000 Disk Array**  
**Storage System**

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CONVEX Press  
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United States of America

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**Service Plan for CLARiiON 2000 Disk Array Storage System**

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# Service Plan for CLARiiON 2000 Disk Array Storage System

CONVEX now offers the DATA GENERAL CLARiiON 2000 Disk Array Storage System. The CLARiiON 2000 provides a compact, high-capacity, high-availability source of disk storage.

The current CONVEX product strategy is to limit the use of the CLARiiON 2000 to Hewlett-Packard workstations using Unitree data management software.

This document provides the service manager advanced information about the CLARiiON 2000 for planning purposes.

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## Product information

The DATA GENERAL CLARiiON 2000 is a fully automatic, random-access library system using from five to twenty high-performance disk modules. A computer can support multiple storage within many configurations. Addressing all possible configurations is not the intent of this document.

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## Technical and performance information

The CLARiiON 2000 storage system connects to the computer in two ways. The main connection is via a SCSI-2 (small computer system interface) Fast/Wide/Differential bus. This connection allows the computer to access the disk modules and the system administrator to configure and monitor the system. The second connection is via an RS-232 serial interface. It also provides a means for system administration, monitoring, and problem analysis. If the host processor is not available, a dumb terminal or personal computer (PC) can be used for problem analysis.

The storage system consists of a SCSI-2, one or two disk-array Storage-Control Processors (SPs), 5 to 20 disk modules, a fan module, up to three power supply modules, and associated cables.

The host computer holds the SCSI-2 adaptor and the storage system holds the remaining components. The SCSI-2 adaptors

can be replaced only by service personnel, but the disk modules, the SP and the power supplies can be replaced by the customer.

The maximum data storage capacity of the CLARiiON 2000 depends upon disk configurations and striping options selected by the customer. The multitude of configurations, disk redundancy schemes, and their effect on performance are covered in the Data General CLARiiON 2000 storage system manual.

#### **Equipment specifications**

The equipment specifications are listed in Table 1:

**Table 1 DATA GENERAL CLARiiON 2000 specifications**

Drive capacity	20
Host computer interface	SCSI-2 F/W/D adaptor with backup RS-232 option
Operating temperature	50°F to 100°F (10°C to 38°C)
Power consumption	950 VA, 900 Watts
Current	9.5 A max. at 100 vac
Weight (maximum)	175.3 lb (79.6 kg)
Height	24.75 in (62.9 cm)
Width	14 in (35.6 cm)
Depth	30 in (76.2 cm)

#### **Facility and clearance requirements**

The DATA GENERAL CLARiiON 2000 requires a room large enough for storage operation and maintenance. These requirements are detailed in this section.

##### **Clearances**

The CLARiiON 2000 requires a front and rear service clearance of 32 inches.

##### **Power requirements**

The CLARiiON 2000 has an autoranging power supply that accepts 90 to 264 vac, single phase 47 to 63 Hz. Clearly mark the service for electrical hazards.

## Environmental requirements

Table 2 The environmental requirements of the CLARiiON 2000

Operational temperature	50°F to 100°F (10°C to 38°C)
Non-operational temperature	-40°F to 149°F (-40°C to 65°C)
Operational temperature change	±18°F (±10°C)
Non-operational temperature change	±43°F (±24°C)
Operational humidity	20% to 80% non-condensing
Non-operational humidity	90% maximum, non-condensing
Humidity change	10% per hour
Altitude	8,000 feet (2,439 meters) maximum

Do not install the CLARiiON 2000 next to equipment that radiates excessive radio frequency interference.

The CLARiiON 2000 requires adequate air conditioning. The room must be able to dissipate 3,072 BTUs (774 Kcal) per hour.

### MTBF and MTR

The mean-time-between-failures of the CLARiiON disk array depends on the number of disks in the array. For an array configuration of 10 disks, the MTBF is approximately 18,000 and for 20 disks the MTBF is approximately 10,000. The time to replace any FRU is approximately 30 minutes. However, when a disk is replaced, the disk array restructures the optimum storage state. Depending on the size of the array (the number of disk in the configuration), the disk striping configuration, and the activity load on the disk array, the restructuring time could take up to four hours. During the restructuring, the disk array is operational, but at a degraded throughput level.

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## System software requirements

The CLARiiON 2000 may be used on Hewlett-Packard 735/755 workstations. The only hardware requirement is that the system have a serial port with RS-232C compatibility and one SCSI-2, Fast/Wide/Differential port.

The CLARiiON 2000 requires the Hewlett-Packard HP-UX v9.01 or higher operating system (CONVEX part number to be determined) and Unitree 1.7.x data management software. Unitree software is licensed based on the amount of data stored in the system. Each installation will need the Unitree Software kit, the base license, and the LTU license.

Order Unitree software by normal sales order procedures. When ready to install the software, call the TAC for a validation key. The part number for the basic software kit and the site license are listed in Table 3.

Table 3 Unitree licensing

Convex part number	System storage size
750-001522-xxx	Unitree Software Kit
750-000490-000	Unitree base license
750-000749-001	30 Gbytes
750-000749-002	60 Gbytes
750-000749-003	140 GBytes
750-000749-004	280 GBytes
750-000749-005	560 GBytes
750-000749-006	900 GBytes
750-000749-007	1.4 TBytes
750-000749-008	2.5 TBytes
750-000749-009	5 TBytes
750-000749-010	10 TBytes
750-000749-011	50 TBytes
750-000749-012	100 TBytes
750-000749-013	500 TBytes
750-000749-014	1,000 TBytes
750-000749-015	5,000 TBytes
750-000749-016	10,000 TBytes
750-000749-200	Source LTU

Future plans may include the use of the Hewlett-Packard 800 series computers as a customer-independent sourcing selection. At this time, CONVEX does not plan to sell nor provide service for the HP800 series products. The customer must contract service directly from Hewlett-Packard.

**Software distribution options**

CONVEX will distribute all software updates and revisions on either digital audio tape (DAT) or compact disc read-only memory (CDROM). The appropriate media selection will depend upon the customer configuration and should be communicated to the CONVEX software distribution group via the original sales order.

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## Service philosophy

CONVEX is the primary service provider for the CLARiiON 2000. This service consists of three levels. The first level is the response to the customer problem call. When the problem call requires corrective (or preventive) maintenance, a service engineer (SSE) is dispatched to the customer site to troubleshoot the problem. Second-level service is fixing the problem with the appropriate spare parts. Third-level service is technical backup from CONVEX headquarters. Personnel with the appropriate expertise are on standby to resolve problems with either the SSE or the customer in some cases. Service personnel require proper training, tools and spare parts before down-time can be kept within specification.

If the customer configuration of the CLARiiON 2000 includes redundancy for disk modules, storage processors, and power modules, the initial levels of corrective maintenance can be shared with the customer system administrator.

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## Spare parts

Service engineers perform field preventive and corrective maintenance activities on certain components of the system. Table 4 shows these field replaceable units (FRUs).

The distribution of spares will be managed over time. The stocked spare parts list is subject to change as CONVEX gains experience.

Table 4 CLARiiON 2000 FRUs

CONVEX P/N	Description	Stocked by CONVEX
204-000029-001	Storage Processor, C2XXX array	X
204-000029-002	Power Module, C2XXX array	X
204-000029-008	Cable, C2200 Storage Processor ID	
204-000029-009	Cable, RS232C Array-to-host 50'	
204-000029-010	Cable, RS232C Array-to-host 25'	
204-000029-011	Cable, C2200 VSC Distribution	
204-000029-012	Cable, C2200 Master Fault	
204-000029-013	Cable, C2200 DC Fan	
204-000029-014	Cable, C2200 SCSI International I/O	
204-000029-015	Harness, C2200 Internal AC Wiring	
204-000029-017	Disk Module, 2.0 GBytes	X
204-000029-018	CRU, Battery Backup Module	X

Table 4 CLARiiON 2000 FRUs (continued)

CONVEX P/N	Description	Stocked by CONVEX
204-000029-019	FRU, Midplane	
204-000029-020	CRU, Fan Module	X
204-000029-028	Internal cable, SP-to-SP 1.8'	
204-000029-029	Terminator, 68-pin fast/wide	

**Recommended tools**

The tools in the standard SSE toolkit are sufficient to maintain the CLARiiON 2000.

**Maintenance**

Maintenance consists of troubleshooting, replacement or repair, and adjusting or calibrating failed FRUs. The CLARiiON 2000 requires no preventive maintenance.

**Level of repair**

The level of repair is determined by the local field support management. Failed FRUs are diagnosed and replaced by the SSE and returned to CONVEX via the logistic procedures appropriate for the region. The spares listed in Table 4 are required to adequately maintain the CLARiiON 2000. These spares will normally be stocked at the depot level.

**Note**

Returned parts (FRUs) must be fully documented or the warranty will not be honored by CLARiiON. Be sure to indicate both the CONVEX and CLARiiON Disk Array serial numbers on all required documentation used to return defective parts.

For logistic procedures contact:

	Primary contact	Region	E-mail login	Phone number
Headquarters Spares Depot	Barbara Lester	US, S. America, Asia, and Pacific	lester	(214) 497-4216
European Distribution Center	Jorge Torres	Europe	torres	31-20-6540251 (Holland)

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## Installation

CONVEX field engineering organization is responsible for installing the CLARiiON 2000. It is also responsible for installing any additional units and exchanging replacement parts. These activities should be accurately recorded by field service personnel in the appropriate reporting system.

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## Support

CONVEX is the primary service provider for the CLARiiON 2000. In the US, the CONVEX Technical Assistance Center (TAC) is the front line of support for SSEs and customers. In other CONVEX regions around the world, the SSE and customer should contact their local CONVEX support office. A second line of support is provided by expert personnel. A secondary points-of-contact for the DATA GENERAL CLARiiON 2000 is:

Point-of-contact	E-mail login	Phone number
Chris Magargee	magargee	(214) 497-4402

### Obtaining spares and tools

When an SSE requires a spare part, he/she will follow established procedures in the appropriate region to obtain that part. Questions concerning the logistics, pricing, and ordering of spare parts and tools should be directed to:

	Primary contact	Region	E-mail login	Phone number
Headquarters Spares Depot	Barbara Lester	US, S. America, Asia, and Pacific	lester	(214) 497-4216
European Distribution Center	Jorge Torres	Europe	torres	31-20-6540251 (Holland)

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## Training

The SSE maintaining the CLARiiON 2000 automated storage library may require a special training course provided by CONVEX. This course covers other peripheral devices than the CLARiiON 2000. The class is in the development stage at this time.

To obtain latest information on this course, contact:

Point-of-contact	E-mail login	Phone number
Chris Magargee	magargee	(214) 497-4402
Debbie Ericksen	ericksen	(214) 497-4239

