
CONVEX
Service Plan for
METRUM RSS-600b
Automated Tape Library



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CONVEX
Service Plan for METRUM RSS-600b Automated
Tape Library

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Service Plan for METRUM RSS-600b Automated Tape Library

CONVEX now offers the METRUM RSS-600b Automated Tape Library. The RSS-600b provides large-scale data archival and backup capability using high-performance robotics and the METRUM RSP-2150 cartridge tape subsystem. This document provides the service manager advanced information about the RSS-600b for planning purposes.

Product information

The METRUM RSS-600b is a fully automatic, random access library system using high-performance robotics and METRUM helical-scan cartridge tape drives to store up to 8,000 Gbytes of data.

The RSS-600b uses the METRUM RSP-2150. Up to six drives may be installed. The RSP-2150 can store 14 Gbytes on a ST-120 tape cassette that has the same form factor as a standard VHS video cassette.

Technical and performance information

The robotics of the RSS-600b have been used in the broadcast industry for several years. Their reliability has been time proven. The positioning accuracy of 1mm allows them to accurately retrieve and place tapes within sixteen seconds (maximum).

The robotics consist of four functional blocks: the dual rotary-storage drums, the elevator, the tape cartridge handler, and the control circuitry. They select a tape in less than 8 seconds. Each of the two rotary drum has six sides, each side holding 50 tapes for a total of 600, and providing horizontal or X-axis motion. The elevator provides vertical or Y-axis motion and contains the tape handler. The handler grabs the appropriate tape from its bin and inserts it into a drive. It provides the Z-axis motion for the robotics. Robot commands and status are sent via an RS-232C, and data is transferred between the host and tape

drives over a separate SCSI interface, thereby eliminating contention between control and data. The robot may also be controlled from a front panel.

The RSS-600b holds up to 600 tapes. Each tape has both a human- and machine-readable barcode label. The robot reads each barcode with an optical scanner. The robot takes inventory of the library within a matter of minutes.

The RSS-600b can hold six helical-scan tape drives. However, the Metrum Deamon V1.1 currently supports only five drives. The drive uses ST-120 cassettes, which have the same form factor as a standard VHS cassette. The DSP-2150 is capable of transferring data at a sustained rate of 2 Mbytes per second.

Note

CONVEX software currently supports only the ST-120 tapes. If it supports the ST-160 and ST-180 tapes in the future, only a single size can be used in the RSS-600b. Mixing tape sizes not is permitted. If tapes of different length are mixed in the RSS-600b, a tape will likely be broken.

Equipment specifications

The equipment specifications are listed in Table 1:

Table 1 METRUM RSS-600b specifications

Cartridge capacity	600
Tape drive capacity	6
Host computer interface	RS-232C
Average cartridge access time	4 seconds
Cartridge bar code	Code 128
Mean swaps per hour	160
Operating temperature	41°F to 95°F (5°C to 35°C)
Power consumption	1500 VA (without drives)
Weight, empty	1480 lb (670 kg)
Weight, fully loaded (6 drives, 600 cassettes)	2095 lb. (949 kg)
Height	79in (200.7 cm)
Width	71 in (180.3 cm)
Depth	39 in (99.1 cm)

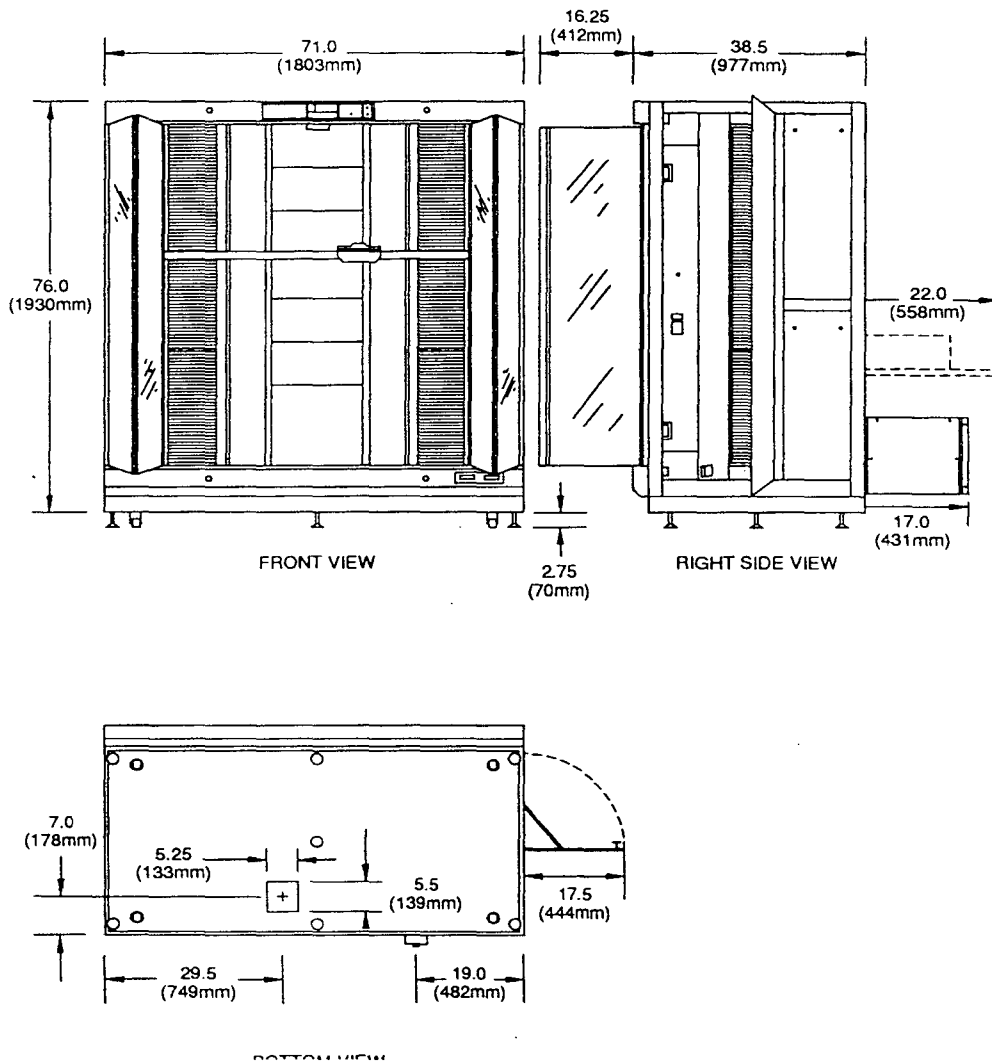
Facility and clearance requirements

The METRUM RSS-600b requires a room large enough for storage operation and maintenance. These requirements are detailed in this section.

Clearances

Figure 1 shows dimensions of the RSS-600b, allowing site administrators to plan for doorway clearance and service area. The ceiling of the operations room must be at least eight feet high, and, if a raised floor is used, must be able to support 1,480 psi (98.64 kilograms per square centimeter).

Figure 1 METRUM RSS-600b outline dimensions



Power requirements

The RSS-600b requires either 117 or 220 vac $\pm 10\%$, single phase, 1500 VA, 50/60 Hz. The outlet must be located within 10 feet of the unit. The nominal service capacity must be either 20 amperes for 117 vac or 10 amperes for 220 vac. Clearly mark the service for electrical hazards, and provide a shunt trip for emergency power off.

Environmental requirements

Table 2 shows the environmental requirements of the RSS-600b.

Table 2 METRUM RSS-600b environmental requirements

Operational temperature	41°F to 95°F (5°C to 35°C)
Non-operational temperature	-23°F to 140°F (-5°C to 40°C)
Operational temperature change	$\pm 18^\circ\text{F}$ ($\pm 10^\circ\text{C}$)
Non-operational temperature change	$\pm 36^\circ\text{F}$ ($\pm 20^\circ\text{C}$)
Recommended operating humidity	40% to 60% non-condensing
Operational humidity	20% to 80% non-condensing
Non-operational humidity	90% maximum, non-condensing
Humidity change	10% per hour
Altitude	10,500 feet (2000 meters) maximum

Do not install the RSS-600b next to equipment that radiates excessive radio frequency interference.

The RSS-600b requires adequate air conditioning. The room must be able to dissipate 2,400 BTUs (300 Kcal).

MTBF and MTTR

All components of the RSS-600b have been designed to be field-replaceable. The mean-time-between-failures is greater than 7,150 hours with a 50% duty cycle, and the mean-time-to-repair is four hours.

System software requirements

The RSS-600b may be used on CONVEX C-Series and HP 735/755 workstations. The only hardware requirement is that the system have a serial port with RS-232C compatibility. The software requirement is system dependent.

C-Series software

To use the METRUM RSS-600b on a CONVEX C-series system, the software listed in Table 3 must be installed.

Table 3 Required software for C-Series systems

CONVEX PN	Product	Description
081-006715-xxx	ConvexOS V10.1 or higher	Operating system
750-002715-xxx	Metrum Daemon V1.1 or higher	RS-232C driver (robotics)
750-000115-xxx	Unitree V1.7.x	Data management software ¹
TBD	FileServ V2.1 for METRUM RSS-600b	Data management software ¹

¹ Must use either Unitree or FileServ, but not both.

Hewlett-Packard 735/755 software

To use the METRUM RSS-600b on the Hewlett-Packard workstations, the software listed in Table 4 must be installed.

Table 4 Required software for HP 735/755 systems

CONVEX PN	Product	Description
750-002715-xxx	Metrum Daemon V1.1	RS-232C driver
750-000115-xxx	Unitree V1.7.x	Data management software ¹
TBD	FileServ (future product)	Data management software (future product) ¹

¹ Must use either Unitree or FileServ, but not both.

Service philosophy

CONVEX is the primary service provider for the RSS-600b. 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. For more information see the "Recommended tools" section on page 9 and the "Training" section on page 13.

Spare parts

The recommended spare parts listed in this section were determined by METRUM. They were calculated based on a unit that will be operational five days a week, eight hours per day, or 2,000 hours per year.

Site-level spares

Operator-level spares are required to maintain the unit with a maximum down-time of one hour. Operator-level maintenance is defined as maintenance performed by the operator or service technician at the customer's site. Table 5 shows the site-level spares.

Table 5 METRUM RSS-600b site-level spares

CONVEX P/N	METRUM P/N	Description
900-000774-004	70404394A	Handler rubber fingers

Depot-level spares

Service engineers perform field preventive and corrective maintenance activities on certain components of the library. Table 6 shows these field replaceable units (FRUs). The distribution of spares will be managed over time.

Table 6 METRUM RSS-600b FRUs

CONVEK P/N	METRUM P/N	Description	Notes			
			1	2	3	4
207-000023-200	19316390	Terminator, RSP-2159, METRUM STD			X	X
900-000773-001	651518-2	Bin sensor, Photo TR1 CCA			X	X
900-000773-002	650880-2	Bin sensor, Photo TR2 CCA			X	X
900-000773-003	650797-2	Display 1 CCA			X	X
900-000773-004	651044-2	Fip I/O CCA			X	X
900-000773-005	650970-2	Manual I/O CCA			X	X
900-000773-006	651257-2	600 elevator sensor CCA			X	X
900-000773-007	651324-2	Bin sensor I/O CCA			X	X
900-000773-008	650968-2	Door I/O CCA			X	X
900-000773-009	650877-2	Bin sensor LED-1 CCA			X	X
900-000773-010	651517-2	Bin sensor LED-2 CCA			X	X
900-000773-011	651053-2	600 switch panel CCA			X	X
900-000773-012	651531-2	Drumzone CCA			X	X
900-000773-013	70491610C	X-axis timing belt XL037G 3.1M		X		X
900-000773-014	70491604D	X-axis timing belt 80XL 037G 3.1M		X		X
900-000773-015	70491604F	X-axis timing belt 100MXL 6.4G (R)		X		X
900-000773-016	70491610D	Y-axis timing belt L100G-3.6M		X		X
900-000773-017	74415634A	Y-axis upper counterweight wire set		X		X
900-000773-018	74415747A	Y-axis lower counterweight wire set		X		X
900-000773-019	70409046C	Y-axis upper wire roller		X		X
900-000773-020	70409046B	Y-axis lower wire roller		X		X
900-000773-021	70491604B	Drum timing belt 120 XL-075G		X		X
900-000773-022	70491604C	Drum timing belt 140 XL-075G		X		X
900-000773-023	651515-1602	Pulse motor control-1			X	X
900-000773-024	74430757A	600 drum motor assembly TS3630N4		X		X
900-000773-025	651515-3602	Pulse motor control-3			X	X
900-000773-026	651515-2602	Pulse motor control-2			X	X
900-000773-027	651901-602	CPU CCA			X	X
900-000773-028	409501-2	Complete handler assembly	X			
900-000774-001	70408425A	Y-axis guide roller (A) center mt		X		
900-000774-002	70408425B	Y-axis guide roller (A) eccentric mt		X		
900-000774-003	651515-2	Drive and I/O CCA			X	X
900-000774-004	70404394A	Handler rubber fingers (4 pc)		X		

Table 6 METRUM RSS-600b FRUs (continued)

CONVEX P/N	METRUM P/N	Description	Notes			
			1	2	3	4
900-000774-005	70402906E	Coil spring (2 pc)		X		
900-000774-006	652031-2	L sensor CCA			X	X
900-000774-007	651043-2	Sensor 1 CCA			X	X
900-000774-008	652032-2	R sensor CCAs			X	X
900-000774-009	651258-2	Drum slit sensor CCA			X	X
900-000774-010	651514-2	Sensor 2 CCA			X	X
900-000775-001	845821000	Cassette sensor switch		X		X
900-000775-002	70405397C	Cassette sensor switch spring		X		X
900-000775-004	857130004	Power supply assembly #1			X	X
900-000775-006	74430434A	Z-axis motor assembly			X	X
900-000775-008	857100124	Power supply assembly #2			X	X
900-000775-009	857100125	Power supply assembly #3			X	X

¹ Mandatory factory repair - cannot be repaired in the field

² Expendable throw-away

³ Repair exchange

⁴ Stocked by CONVEX

Recommended tools

The tools listed below are recommended to maintain the RSS-600b. Some of the tools listed may be contained in the standard service engineer's tool kit. This list is provided to determine which additional tools to purchase.

Common tools

The RSS-600b requires the following common tools:

1. Digital multimeter (0 - 250 vdc/vac/ Ω , ± 0.001 volt accuracy)
2. Oscilloscope (25 Mhz, general purpose with probes)
3. Flat-blade screwdriver
4. Phillips screwdriver
5. Hex-driver set
6. Open-end wrench set

Special tools

The RSS-600b requires the following special tools:

1. Spring scale, compression type, 5 -10 lb (2.2 - 4.5 kg)
2. Compression/tension scale, 0-35 ounces (0-1 kg)
3. 36-pin CCA extender card (P/N 650475)
4. PC portable computer with RS232C serial port and communications software, or dumb terminal with RS232C serial interface

Maintenance

Preventive maintenance (PM) consists of periodically replacing certain components; corrective maintenance (CM) consists of troubleshooting, replacement or repair, and adjusting or calibrating failed FRUs. Preventive maintenance consist of two categories: operator and service PM. Operator's PM is regular inspection and cleaning of the RSS-600b. Service PM is performed by service personnel and is the regular replacement of key items that are subject to failure after a time.

Level of repair

The level of repair is determined by the local Field Support management. With training, all adjustment and cleaning can be performed by CONVEX SSEs. 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 6 are required to adequately maintain the RSS-600b. These spares will normally be stocked at the depot level.

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)

Diagnostic approach

The diagnostic approach for the METRUM RSS-600b will be to:

1. Use operating system error messages
2. Use RSS-600b front panel to run diagnostic routines
3. Locate and replace failed FRU

Preventive maintenance schedule

Table 7 lists those parts requiring periodic replacement, cleaning, or adjustment. Unless otherwise stated, the actions listed should be performed every three months or on the

regularly scheduled preventive maintenance schedule for the site.

Table 7 Preventive maintenance schedule

Part number	Description	Action required	Interval
	Drum assembly (both)	Adjust	6 months
900-000774-004	Handler rubber fingers	Adjust or replace	6 months
900-000775-005	Barcode reader CCA	Adjust	6 months
900-000775-006	Z-axis motor	Replace	12-18 months
900-000775-013	Z-axis motor CCA	Adjust	12-18 months
900-000773-013	X-axis timing belt XL037G 3.1M	Inspect and adjust	6 months
900-000773-014	X-axis timing belt 80XL 037G 3.1M	Inspect and adjust	6 months
900-000773-015	X-axis timing belt 100MXL 6.4G (R)	Inspect and adjust	6 months
900-000773-016	Y-axis timing belt L100G-3.6M	Inspect and adjust	6 months
900-000773-021	Drum timing belt 120 XL-075G	Inspect and adjust	12-18 months
900-000773-022	Drum timing belt 140 XL-075G	Inspect and adjust	12-18 months
900-000773-023	Pulse motor control 1 CCA	Adjust	12-18 months
900-000773-025	Pulse motor control 3 CCA	Adjust	12-18 months
900-000773-026	Pulse motor control 2 CCA	Adjust	12-18 months
900-000773-028	Handler assembly (all four)	Adjust	6 months
900-000775-023	Air filter element	Replace	6 months

Installation

CONVEX field engineering organization is responsible for installing the RSS-600b and the RSP-2150 tape drives. 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.

Support

CONVEX is the primary service provider for the RSS-600b. 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. These secondary points-of-contact for the METRUM RSS-600b are:

Point-of-contact	E-mail login	Phone number
Kelvyn Gipp	kgipp	(214) 497-4601

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)

Training

The SSE maintaining the RSS-600b automated storage library requires two training courses. One course provides training on the RSP-2150, and the other on the RSS-600b. Training on the RSP-2150 is a prerequisite for training on the library unit.

The table below shows when these classes will be offered in June 1994.

Class	Estimated cost (1994)	Date
RSP-2150	\$750	June 6 - 8
RSS-48/600	\$500	June 9 - 10

To obtain latest prices or register for these courses, contact:

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

