RM300 E / RM400 E

Storage Devices
(Reliant UNIX)

Edition November 1999

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1 Preface

This manual describes the drives for removable media and for hard disks that you can install in your RM300 E or RM400 E system unit. The drives are operated under the Reliant UNIX operating system. This manual is aimed at those responsible for installing and operating the drives.

When installing storage devices, please follow all the instructions in the sequence specified in the technical description of the product manual for your system unit in order to avoid errors and speed up the process. Which instructions are relevant to you depends on the hardware installed in your system unit.

This manual describes how to configure, operate and maintain the drives. For further details refer to the manual “Reliant UNIX Installation Guide“ supplied with the software. Application programs are installed and configured under Reliant UNIX.

If you do not wish to perform the upgrade procedure yourself, you can avail yourself of the installation service offered by Fujitsu Siemens Computers GmbH.

1.1 Structure of the manual

After the section entitled “Important notes”, you will find information on configuration, operation, handling volumes, maintenance and accessories for the following drives:

– Quarter-inch cartridge tape drives

– 4 mm MTC drives

– 8 mm MTC drive (7 Gbyte)

– 8 mm MTC drive (20 Gbyte)

– Autoloaders

– CD-ROM drives

– Hard disk drives

How to operate the floppy disk drive that comes already fitted in your system unit is described in your system unit product manual.

The DLT drive (MC80) is described in a separate manual (order number: U25425-J-Z716-1-7400).

Further information

How to install the drives in the system unit is explained in the technical description in your system unit product manual.

If the drive is already fitted in your system unit when shipped, the software is automatically installed and configured when the system is first started up. In this case you do not need to read the corresponding “Installation” and “Settings” sections.

1.2 Important notes

This description must only be used in conjunction with the manuals “RM300 E / RM400 E - General Information“ and the product manual of your system unit (“RM300 E - System Unit“ or „RM400 E - System Unit“), as only these manuals contain the appropriate security information and the procedure for installing the drives.

It is important that you read the notes on RF suppression, electromagnetic compatibility, and the suggested procedures for disposal and recycling. This information can also be found in the manual “RM300 E / RM400 E - General Information“.

These devices comply with the requirements of the EC directive 89/336/EEC regarding “Electromagnetic compatibility“. Therefore the system is marked with the CE symbol (CE=Communauté Européenne)

1.3 Transport

When you move the drives you must make sure that they do not contain any volumes. With CD drives, the CD tray must be retracted to avoid damage to the drive.

You are advised to keep the original packaging of the drives in case you need to transport them.

Transport the drives only in their original packaging or other suitable packaging which provides protection against impact and static discharge.

The drives must only be opened by authorized specialist staff. Improper opening can be dangerous to the eyes.

2 Quarter-inch cartridge tape drives

The quarter-inch MTC drives allow you to read and write magnetic tape cartridges with a capacity up to 8 Gbyte (compressed) according to the QIC standard (QIC=Quarter-Inch Cartridge). It is also possible to read magnetic tape cartridges with a capacity of 60 Mbyte (QIC-24).

If the MTC drive is already fitted in your system unit when shipped, the software is automatically installed and configured when the system is first started up. In this case you need not read the chapter entitled “Installation“.

2.1 Technical data

Name	MK21	MC16
Height	half height	half height
Capacity	525 Mbyte, formatted	4 Gbyte, formatted
Recording format	QIC 525/150	QIC-4GB - Compressed, QIC-4GB, QIC-2GB - Compressed, QIC-2GB, QIC-1000, QIC-525, QIC-150, QIC-120
Recording density	16 000 bpi	up to 49640 bpi
Recording speed	Approx. 200 Kbyte/s	Approx. 380 Kbyte/s

2.2 Installation

Installing the MTC drive

The MTC drive requires a half-size bay.

► Install the MTC drive as described under “Installing a drive“ in the technical description of your system unit’s product manual.

General information for MK21 (MC12)

Order unit	RM303-MK21	Net	525 MB
Identification no.	87860.02.6.09	Gross	
Manufacturer	Tandberg	Size	5 ¼ inch
Type	TDC 3820	Height	HH (1.6 inch)
UNIX type	MC12	UNIX release	Reliant UNIX 5.44B
Vendor string	TANDBERG TDC 3800	SCSI type	SE 8 bit

General information for MC16

Order unit	RM303-MC16 RM403-MC16	Net	4 GB
Identification no.	89760.00.5.09	Compressed	8 GB
Manufacturer	Tandberg	Size	5 ¼ inch
Type	TDC4000	Height	HH (1.6 inch)
UNIX type	MC12	UNIX release	Reliant UNIX 5.44B
Vendor string	TANDBERG SLR5 4/8 GB	SCSI type	SE 8 bit

Settings

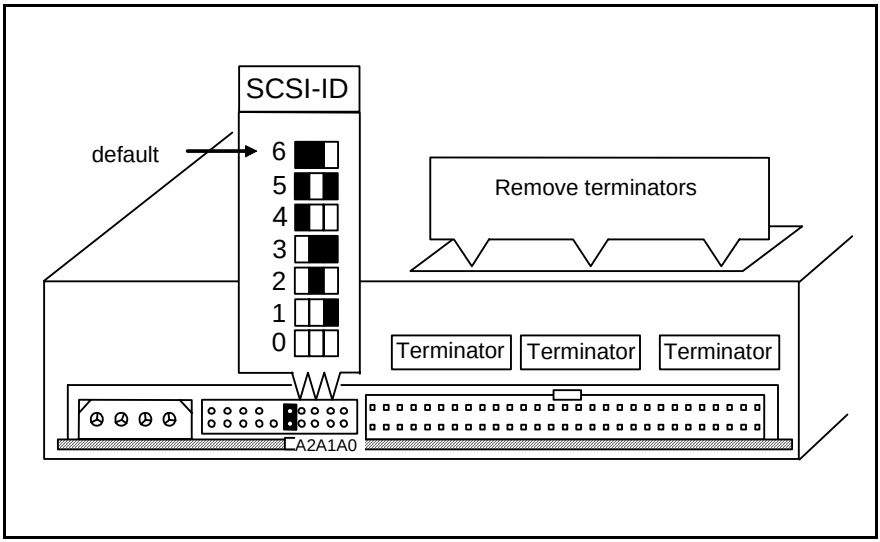


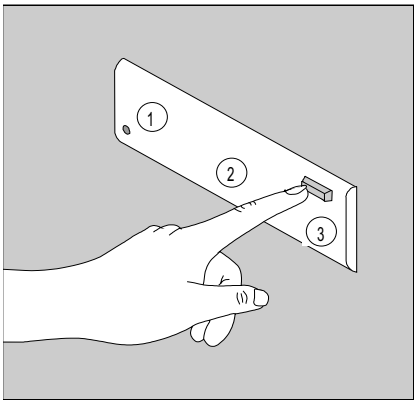
Figure 1: Settings for the quarter-inch tape drive

2.3 Operating the quarter-inch MTC drive

You should only open the drive flap when you wish to insert or remove a magnetic tape cartridge. At all other times, the MTC drive (drive flap) should remain closed in order to prevent dirt (e.g. dust) from entering the drive.

Opening/closing the quarter-inch MTC drive

► Press the release button in the top right corner of the drive flap of the quarter-inch MTC drive.



(1) Access indicator

(1) Drive flap
The drive slot is located behind the drive flap. Insert the 1/4 inch magnetic tape cartridge into this slot.

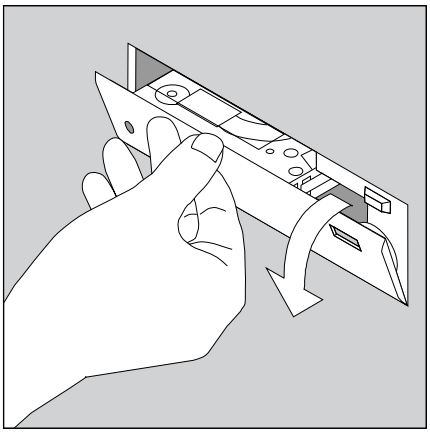
(2) Release button in the drive flap

Figure 2: Quarter-inch MTC drive controls

The **access indicator** always lights up when the MTC drive is active (e.g. when the system checks whether a cartridge has been inserted, when a tape is being rewound or wound forward, when data is being read from the tape or when data is being written to tape).

The drive flap must not be unlocked while the access indicator is illuminated.

► Now completely open the drive flap



Open the drive flap fully when you want to insert or remove a cartridge (do not attempt to force the drive flap beyond its normal open position).

Figure 3: Opening the quarter-inch MTC drive

► Close the MTC drive by pressing the drive flap gently.

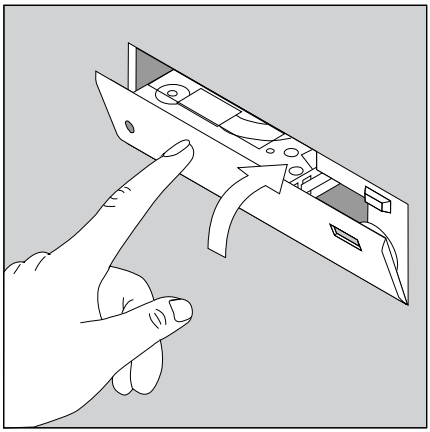


Figure 4: Closing the quarter-inch MTC drive

Inserting a quarter-inch magnetic tape cartridge

- ► Check that the access indicator is not illuminated.
- ► Open the drive flap by pressing the release button.
- ► Insert the cartridge with the metal plate facing down and the tape aperture to the left. Push the cartridge home into the drive opening.

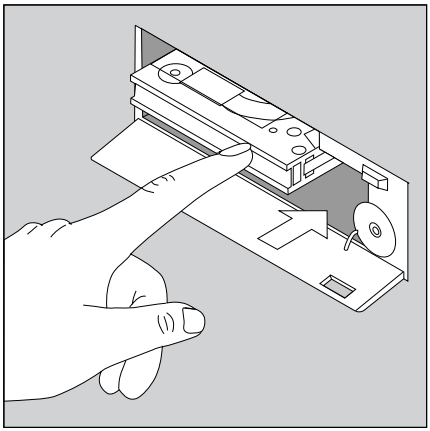


Figure 5: Inserting a quarter-inch magnetic tape cartridge

The cartridge should protrude slightly from the drive opening after insertion.

If you attempt to insert a cartridge incorrectly, you will encounter resistance. Never attempt to apply force when inserting the cartridge into the drive!

- ► Now close the drive flap.

The cartridge is now drawn in entirely. The drive flap must close fully.

Once the cartridge has been inserted, the tape is tensioned. This is done by winding the tape backward and forward. Finally, the read/write head is located in the MTC drive and the tape is again wound backward and forward a number of times.

The MTC drive is ready for reading or writing once the access indicator is no longer illuminated.

Removing a quarter-inch magnetic tape cartridge

You must always wait until the access indicator is no longer illuminated, i.e. until the tape in the cartridge is no longer in motion.

- ► Open the drive flap by pressing the release button.
- ► Remove the cartridge as shown in the diagram

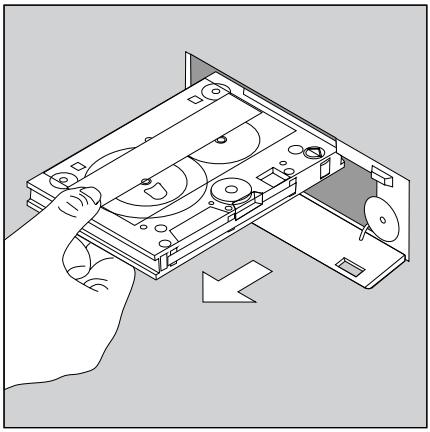


Figure 6: Removing a quarter-inch magnetic tape cartridge

- ► Close the drive flap or insert a different cartridge and close the drive flap.

2.4 Handling quarter-inch magnetic tape cartridges

Magnetic tape cartridges with a capacity up to 4 GB (QIC-4GB cartridge) are available for the quarter-inch tape drive.

In order to achieve the best possible recording quality, it is recommended that the magnetic tape cartridges supplied by your local Fujitsu Siemens Computers office are used. These cartridges are precisely matched to the characteristics of the drive.

Magnetic tape cartridges can be ordered directly by calling your local Fujitsu Siemens Computers office (see the chapter “Accessories” on page 87).

2.4.1 Life of a magnetic tape cartridge

The life of a cartridge depends on the frequency with which the tape passes the read/write head. The number of “head passes” is proportional to the quantity of data transferred.

The following applies to quarter-inch cartridges with a capacity of 155 and 525 Mbyte.

A maximum of **5000** head passes can be performed.

The tape has 18 tracks. The entire length of the tape passes the read/write head for each track. If 155 or 525 Mbytes of data have been written to this tape, the entire tape will have passed the read/write head a total of 18 times. This means that the cartridge can be written with 155 or 525 Mbytes of data approximately **260 times**. If the data is read once for each time it is written, the life of the cartridge is reduced to **130** complete read/write operations for 155 or 525 Mbytes of data.

Ambient conditions also have a considerable effect on the life of a magnetic tape cartridge. You should therefore take special note of the following section on the care of magnetic tape cartridges.

2.4.2 Care of quarter-inch magnetic tape cartridges

The **correct** way to care for magnetic tape cartridges is as follows:

- Always store magnetic tape cartridges in their original packaging.
- Before use, store magnetic tape cartridges in their operating environment for at least **24** hours. If magnetic tape cartridges have been exposed to high humidity or high temperatures, they must be stored in the operating environment for at least three or four days. Cartridges which have not been acclimatized are difficult to read and can attack the read/write head.

You should **never** treat a magnetic tape cartridge as follows:

- Do not expose cartridges to direct sunlight or heat. The specified storage temperature is between +5 °C and +45 °C. The ideal storage temperature, however is 20 °C ± 5 °C with a relative humidity between 30 % and 60 %.
- Do not allow magnetic tape cartridges to come into contact with magnetic objects.
- Do not use cleaning agents, solvents or thinners on magnetic tape cartridges.

As a general rule:

The following criteria cause a rapid reduction in the usability and reliability of magnetic tape cartridges and MTC drives:

- unacceptable temperatures
- sudden changes in temperature
- high dust levels (printer in the direct vicinity)
- inappropriate handling or storage of cartridges
- insufficient cleaning of MTC drives
- occasional use of inappropriate or spent tapes and cleaning materials.

2.4.3 Mechanical write protection for quarter-inch magnetic tape cartridges

You can protect magnetic tape cartridges from inadvertent overwriting or deletion by twisting the SAFE switch until the arrow points to the SAFE position (see diagram below)

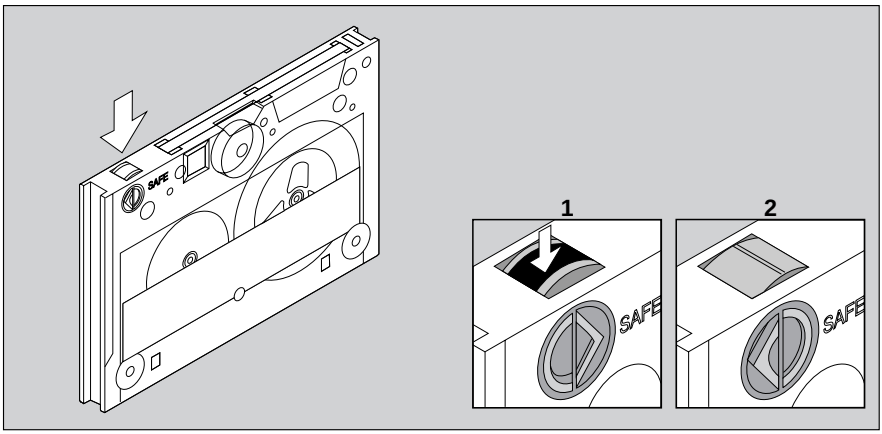


Figure 7: Mechanical write protection for a quarter-inch magnetic tape cartridge

(1) write-protected

(2) not write-protected

Insertion and removal of magnetic tape cartridges is described in the section “Operating the quarter-inch MTC drive” on page 7.

3 4 mm MTC drives (DAT)

The 4 mm MTC drive allows you to read and write to 4 mm magnetic tape cartridges. The format of these cartridges derives originally from the field of entertainment electronics, which also gave them the name DAT (Digital Audio Tape). However, since the requirements with regard to reliability are higher when a tape is used for recording data than when it is used for recording music, it is necessary to use special magnetic tape cartridges (see also the section “Handling 4 mm magnetic tape cartridges”).

Up to 12 Gbytes of data can be stored on a 4 mm magnetic tape cartridge with a length of 120 m if no compression is used. This MTC drive also allows data compression, so that, depending on the type of data, between 8 and 24 Gbytes of data can be recorded.

3.1 Technical data

Name	MC41	MC44
Height	Half height	Half height
Capacity	4 - 16 Gbytes	12 - 24 Gbytes
Recording format	DDS-1, DDS-2 and DDS-DC	DDS-1, DDS-2, DDS-3 plus data compression
Recording speed	510 Kbyte/s (without data compression) up to 1.5 Mbyte/s (with data compression)	1.0 Mbyte/s (without data compression) up to 2.0 Mbyte/s (with data compression)

3.2 Installation

The MTC drive requires a half-size bay.

► Install the MTC drive as described under “Installing a drive“ in the technical description of your system unit’s product manual.

General information for MC41

Order unit	RM303-MC41 RM403-MC41	Net	4.0 GB
Identification no.	51346.01.3.09	Gross	
Manufacturer	HP C1533A	Height	3 ½ inch in 5 ¼ inch frame
Type	M444	Size	HH (1.6 inch)
UNIX type	MC23	UNIX release	Reliant UNIX 5.44B
Vendor string		SCSI type	SE 8 bit

General information for MC44

Order unit	RM303-MC44 RM404-MC44	Net	12.0 GB
Identification no.	51348.01.7.09	Gross	
Manufacturer	Hewlett Packard	Height	3 ½ inch in 5 ¼ inch frame
Type	HP C1537-00150	Size	HH
UNIX type		UNIX release	Reliant UNIX 5.44B
Vendor string		SCSI type	SE 8 bit

Settings for the 4 mm MTC drives (DAT)

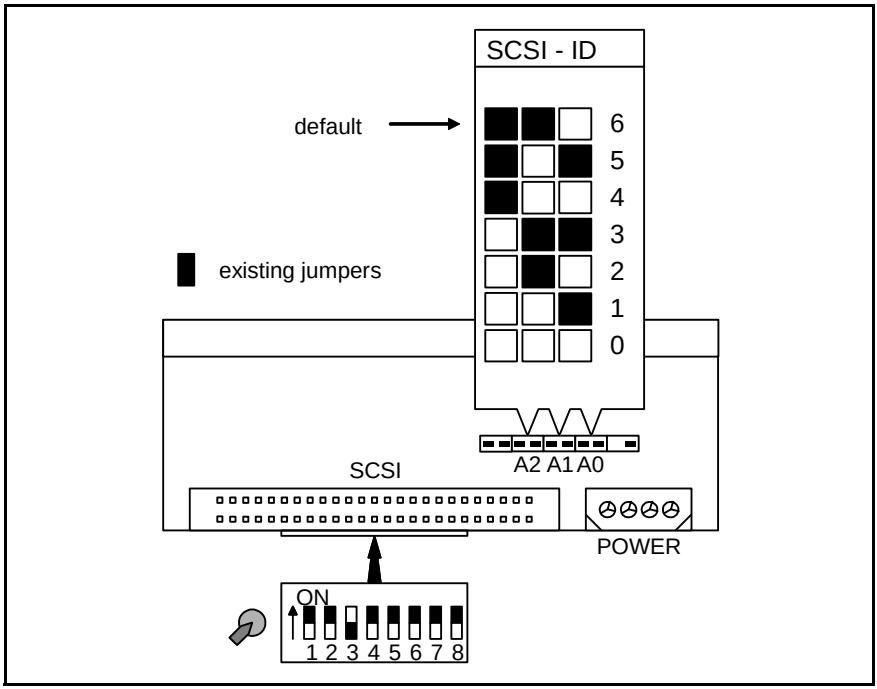


Figure 8: Settings for the 4 mm MTC drives

The option switches on the underside of the device have the following functions:

Switch 1 and 2 set on ON:

Data compression at startup activated; with host control

Switch 3:

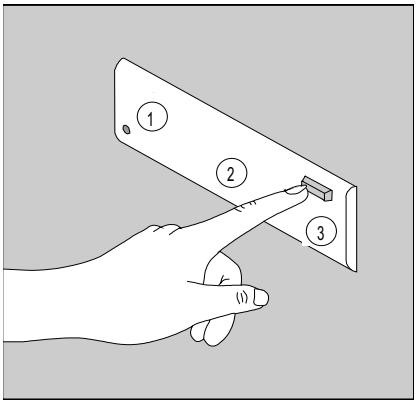
The DDS media recognition system is enabled. Tapes without the corresponding stripes are considered write-protected. The default setting for the switch is OFF.

Switches 4 through 8

These switches are used to define the drive's connectivity and functionality according to the host and customer requirements. The default setting for all switches is ON.

3.3 Operating the 4 mm MTC drive

The 4 mm MTC drive has the following controls:



(1) Green LED (standby indicator)

(2) Amber LED (error indicator)

(3) Release button

Figure 9: Controls: 4 mm MTC drive

The indicators have the following meanings:

- The **standby indicator** flashes when the MTC drive's self-test is running after the system has been powered up.

  The standby indicator also flashes when the MTC drive is accessed during normal operation.

  The indicator is illuminated when a cartridge has been inserted and no data is being sent to the MTC drive or when the tape is not in motion.

  It is extinguished when no cartridge has been inserted.

  4 mm cartridges require relatively long preparation and positioning times. The standby indicator thus flashes for a corresponding length of time.

- The **error indicator** can display two different colors: amber or green. It only displays green immediately after the system has been powered up. The indicator is extinguished once the self-test has been passed.

  If the error indicator flashes amber, the MTC drive should be cleaned without delay, since it is no longer possible to guarantee correct operation.

  If the error indicator is illuminated in amber, the MTC drive has a fault.

You must not press the release button of the MTC drive if the data transfer or standby indicator is illuminated or flashing. This can cause loss of data.

Inserting a 4 mm magnetic tape cartridge

► Check that the standby indicator is not illuminated or flashing.

► With the window face up, push the cartridge into the drive slot until it is drawn in automatically.

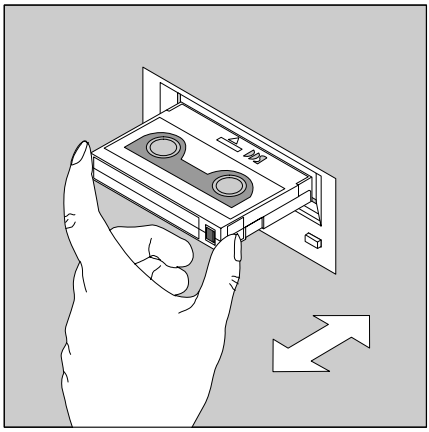


Figure 10: Inserting and removing a 4 mm magnetic tape cartridge

The magnetic tape cartridge is now inserted. The standby indicator (green LED) is illuminated.

Removing a 4 mm magnetic tape cartridge

► Always wait until the standby indicator (green LED) is no longer flashing and is illuminated and the read or write operation has been completed. This means that the tape has stopped.

► Press the release button. This causes the cartridge to be ejected.

After you have pressed the button, the tape is first wound from the read/write head and then ejected automatically.

► Remove the cartridge.

3.4 Tips for avoiding problems during data backup

If you observe a few important rules when using the 4 mm MTC drive and the appropriate cartridges, you will avoid problems with the drive and will have a reliable data backup device with an extraordinarily large capacity.

- Eliminate any sources of dust or other impurities in the vicinity of systems using 4 mm MTC drives. Paper and toner dust from printers and photo-copiers is particularly aggressive.
- Clean the MTC drive regularly and observe the sequence described in for this drive in the chapter on “Care and maintenance”. Failure to clean the drive or insufficient cleaning increases the read/write error rate, speeds up wear on the tape and the head drums and can even lead to contaminants being burned into the head drum. In this last case, even the use of a cleaning cartridge will not rectify the problem; the drive must be sent into the service center for cleaning and inspection.
- Only use the MTC drive in streaming mode. This means that data is written and read without stopping the tape.

  Wear on the magnetic tape drum and the tapes themselves is increased considerably if you do not observe this rule and instead use the MTC drive in start/stop mode.

  The MTC drive will operate in streaming mode if you

  – perform backups at times when the load on the system is low;
  – specify a block size ≥ 16 Kbyte in the backup command.

In addition, you should observe the notes in the section “Handling 4 mm magnetic tape cartridges” regarding care of magnetic tape cartridges.

3.5 Handling 4 mm magnetic tape cartridges

Only use 4 mm magnetic tape cartridges which bear the symbols DDS (Digital Data Storage) and MRS III (Media Recognition System). The use of other cartridges can lead to incorrect operation. Refer to the chapter “Accessories” on page 87 for a list of suitable 4 mm magnetic tape cartridges. It is not possible to read or write to DAT audio tapes.

In order to achieve the best possible recording quality, it is recommended that the magnetic tape cartridges supplied by your local Fujitsu Siemens Computers office are used (see the chapter “Accessories” on page 87). These cartridges are precisely matched to the characteristics of the drive.

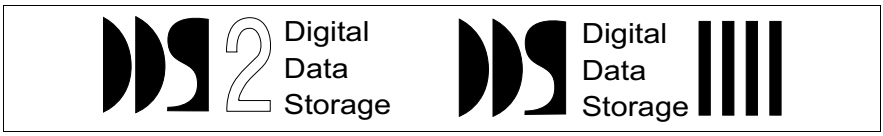


Figure 11: The symbols found on admissible magnetic tape cartridges

4 mm magnetic tape cartridges should only remain in the MTC drive for as long as necessary. Store the cartridges in their original packaging, which provides ideal protection against dust.

Magnetic tape cartridges can be ordered directly by calling your local Fujitsu Siemens Computers office (see the chapter “Accessories” on page 87).

3.5.1 Life of a magnetic tape cartridge

The life of a cartridge depends on the frequency with which the tape passes the read/write head. The number of “head passes” is proportional to the quantity of data transferred.

The following applies to 4 mm cartridges.

A maximum of **1500** head passes can be performed.

One backup requires three passes of the tape, since the tape is deleted, written and then rewound. This means that approx. **500** backup operations are possible.

If, however, each of these backups is read once, the life of a 4 mm cartridge is reduced to approx. **250** backup runs.

If the MTC drive is working in start/stop mode, i.e. if the tape is regularly stopped and the read/write head continues to revolve, the life of the cartridges is reduced dramatically.

Ambient conditions also have a considerable effect on the life of a magnetic tape cartridge. You should therefore take special note of the following section on the care of magnetic tape cartridges.

3.5.2 Care of 4 mm magnetic tape cartridges

The **correct** way to care for magnetic tape cartridges is as follows:

- Always store magnetic tape cartridges in their transport case.
- Before use, store magnetic tape cartridges in their operating environment for at least **24** hours. If magnetic tape cartridges have been exposed to high humidity or high temperatures, they must be stored in the operating environment for at least three or four days. Cartridges which have not been acclimatized are difficult to read and can attack the read/write head.

You should **never** treat a magnetic tape cartridge as follows:

- Do not expose cartridges to direct sunlight or heat. The specified storage temperature for 4 mm magnetic tape cartridges is between +5 °C and +32 °C. The ideal storage temperature, however is 20 °C ± 5 °C with a relative humidity between 30 % and 60 %.
- Do not allow magnetic tape cartridges to come into contact with magnetic objects.
- Do not use cleaning agents, solvents or thinners on magnetic tape cartridges.
- You should only leave a 4 mm cartridge in the MTC drive for as long as is necessary. Since the tape in the MTC drive remains wound around the read/write head, even small quantities of dust can cause damage to the MTC drive.

As a general rule:

The following criteria cause a rapid reduction in the usability and reliability of magnetic tape cartridges and MTC drives:

- unacceptable temperatures
- sudden changes in temperature
- high dust levels (printer in the direct vicinity)
- inappropriate handling or storage of cartridges
- insufficient cleaning of MTC drives
- occasional use of inappropriate or spent tapes and cleaning materials.

3.5.3 Mechanical write protection for 4 mm magnetic tape cartridges

4 mm magnetic tape cartridges have a write protection facility on the long edge opposite the tape. Write protection is activated when the slider does not cover the aperture (see diagram)

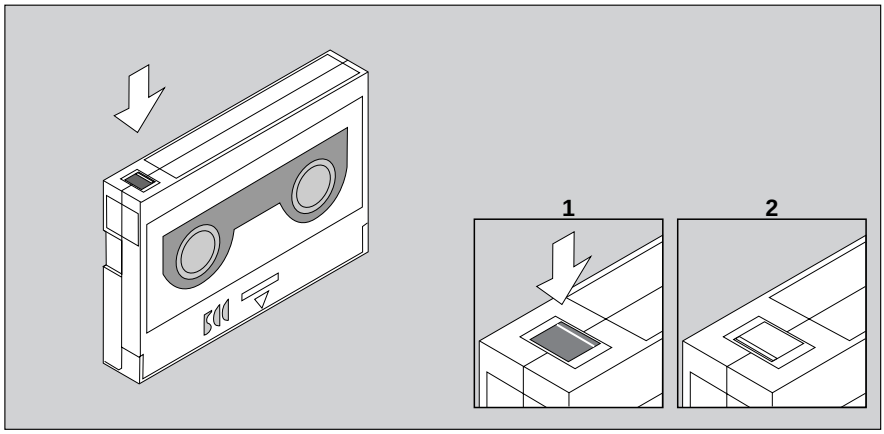


Figure 12: Mechanical write protection for 4 mm magnetic tape cartridges

(1) write-protected

(2) not write-protected

Insertion and removal of magnetic tape cartridges is described in the section “Operating the 4 mm MTC drive”.

4 8 mm MTC drive (7 Gbyte)

The 8 mm MTC drive is a system for writing to and reading special removable 8 mm magnetic tape cartridges. The format of these cartridges derives originally from the field of entertainment electronics. However, since the requirements with regard to reliability are a lot higher when a tape is used for recording data than when it is used for recording video images, it is necessary to use special magnetic tape cartridges.

8 mm MTC drives are particularly suitable for archiving large quantities of data. The 8mm magnetic tape cartridges are written to magnetically and can be deleted again as required. Errors during operation are corrected automatically (ECC = Error Correction Code).

Up to 7 Gbytes of data can be stored on an 8 mm magnetic tape cartridge with this MTC drive if no compression is used. This MTC drive also allows data compression, which enables the recording capacity to be increased in relation to the compression factor. The compression factor depends on the type of data and is usually 2. In other words, 14 Gbytes can be recorded with this drive.

If the MTC drive is already fitted in your system unit when shipped, the software is automatically installed and configured when the system is first started up. In this case you need not read the chapter entitled “Installation“.

4.1 Technical data

Name	MC15
Height	Half height
Capacity	7/14 Gbyte (with a 160 m cartridge)
Recording format	8 mm helical scan
Recording speed	1 Mbyte/s (without data compression)
SCSI bus address	ID selectable

4.2 Installation

Installing the MTC drive

The MTC drive requires a half-size bay.

- Install the MTC drive as described under “Installing a drive“ in the technical description of your system unit’s product manual.

Order unit	RM303-MC15 RM404-MC15	Net	7 Gbyte
Identification no.	99000.00.4.09	Gross	
Manufacturer	Exabyte	Height	5 ¼ inch
Type	Eliant 820	Size	HH (1.6 inch)
UNIX type	MC15	UNIX release	Reliant UNIX 5.44B
Vendor string		SCSI type	SE 8 bit

Settings

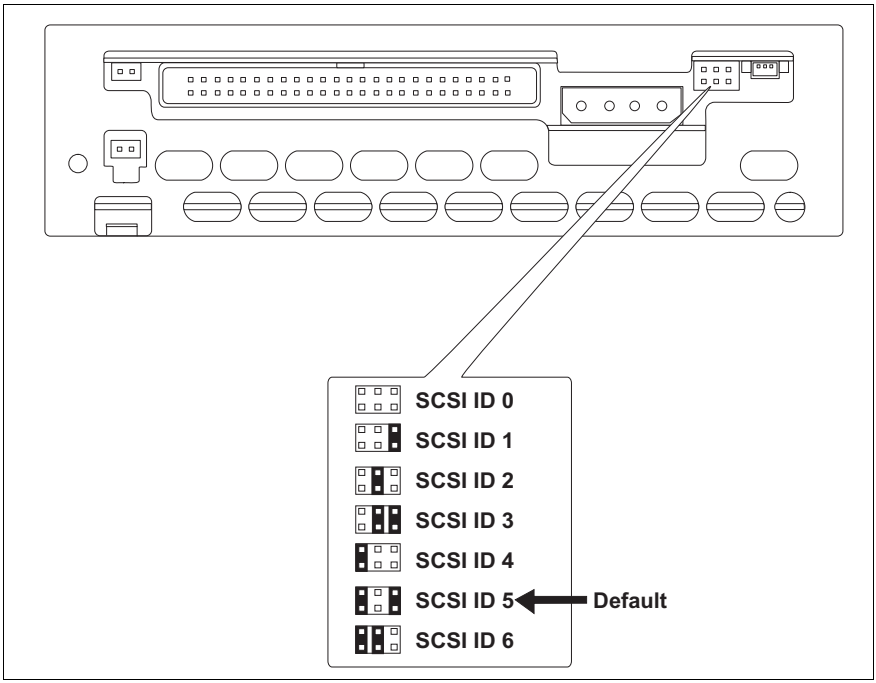
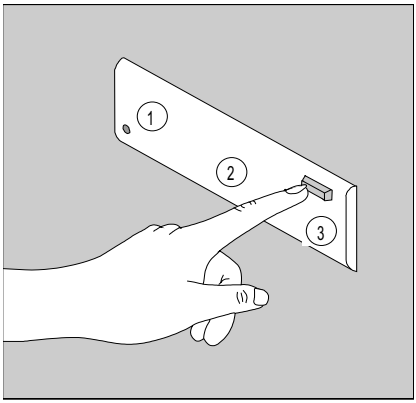


Figure 13: Settings for the 8 mm MTC drive (7/14 Gbyte)

4.3 Operation

The 8 mm, 7 Gbyte MTC drive has the following controls:



(1) Release button

(2) amber LED (error indicator)

(3) green LED (data transfer indicator)

(4) green LED (standby indicator, tape is being positioned or is in motion)

Figure 14: Controls: 8 mm, 7 Gbyte MTC drive

Please note the following:

Only use EXATAPE-approved 8 mm magnetic tape cartridges. Other cartridges can cause problems. Information on approved 8 mm cartridges is provided in this manual in the chapter entitled “Accessories”.

If this drive is to read a cartridge that was written in 2.3 Gbyte mode, you must activate the write protection for the cartridge, otherwise it will be ejected.

- The **error indicator** (2, amber LED) lights up when the system is powered up and is extinguished once the self-test has been passed successfully. It only flashes if the MTC drive has a fault or if the MTC drive requires cleaning.

Access to the drive will be blocked if the cleaning instructions are continually ignored.

Observe the correct sequence of actions for cleaning this MTC drive as described in the section “Cleaning the 8 mm cartridge tape drive” on page 83.

- The tape **motion indicator (3, green LED)** only lights up after the system has been powered up. It then flashes and is extinguished once the self-test of the drive has been passed successfully.

  The data transfer indicator flashes while the drive is being accessed, and stops flashing when there is no access, i.e. no data is being sent to it.

- The standby indicator (4) indicates the following situations:

  – It does not glow or flash when there is no cartridge in the drive.
  It also does not glow or flash if the drive contains a cartridge whose tape is not wound round the read/write head.

  – It glows when the drive contains a cartridge whose tape is not being spooled. The tape is wound round the read/write head.

  – It flashes when the drive contains a cartridge whose tape is being spooled. It also flashes when the drive needs cleaning.

An 8mm tape requires relatively long startup and positioning times, during which the standby indicator flashes constantly.

You must not press the release button of the MTC drive if the data transfer indicator is lit or is flashing and the standby indicator is flashing, otherwise you could lose data.

Inserting an 8 mm magnetic tape cartridge

► Check that neither the tape motion indicator nor the standby indicator is flashing.

► Look into the MTC drive to check that no cartridge is already inserted.

► With the window to the left, push the cartridge into the drive slot until it is drawn in automatically.

If you insert the cartridge incorrectly you will feel some resistance. Do not then try to insert the cartridge forcefully into the drive!

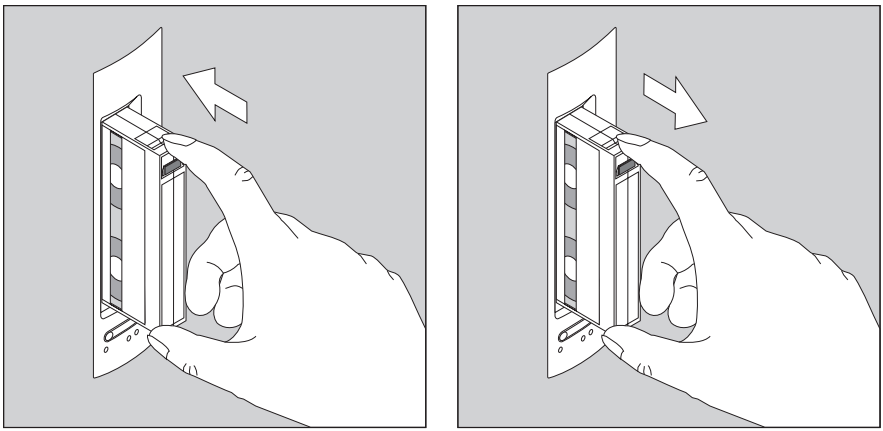


Figure 15: Inserting and removing a 8 mm cartridge

The cartridge is now inserted. The tape motion indicator (green LED) is illuminated.

Removing an 8 mm magnetic tape cartridge

Do not leave a cartridge in the drive any longer than absolutely necessary. Even small quantities of dust can cause damage during subsequent operation of the MTC drive.

- ► Make sure that the tape has stopped moving, i.e. the tape motion indicator (green LED) is no longer flashing and the ready indicator is bright.
- ► Press the release button. This causes the cartridge to be ejected.

After you have pressed the button, the tape is first wound from the read/write head and the cartridge is then ejected automatically.

- ► Remove the cartridge.

5 8 mm MTC drive (20 Gbyte)

The 8 mm MTC drive is a system for writing to and reading special removable 8 mm magnetic tape cartridges. The format of these cartridges derives originally from the field of entertainment electronics. However, since the requirements with regard to reliability are a lot higher when a tape is used for recording data than when it is used for recording video images, it is necessary to use special magnetic tape cartridges.

8 mm MTC drives are particularly suitable for archiving large quantities of data. The 8mm magnetic tape cartridges are written to magnetically and can be deleted again as required. Errors during operation are corrected automatically (ECC = Error Correction Code).

Up to 20 Gbytes of data can be stored on an 8 mm magnetic tape cartridge with this MTC drive if no compression is used. This MTC drive also allows data compression, which enables the recording capacity to be increased in relation to the compression factor. The compression factor depends on the type of data and is usually 2. In other words, 40 Gbytes can be recorded with this drive.

If the MTC drive is already fitted in your system unit when shipped, the software is automatically installed and configured when the system is first started up. In this case you need not read the chapter entitled “Installation“.

5.1 Technical data

Name	MC75
Height	Half height
Capacity	20/40 Gbyte (with a 170 m cartridge)
Recording format	8 mm helical scan
Recording speed	3 Mbyte/s (without data compression)
SCSI bus address	ID selectable

5.2 Installation

Installing the MTC drive

The MTC drive requires a half-size bay.

- Install the MTC drive as described under “Installing a drive“ in the technical description of your system unit’s product manual.

General information

Order unit	RM303-MC75 RM403-MC75	Net	20 Gbyte
Identification no.	69302.00.5.09	Gross	40 Gbyte
Manufacturer	Exabyte	Height	5 ¼ inch
Type	8900	Size	HH
UNIX type	MC75	UNIX release	Reliant UNIX 5.44B
Vendor string		SCSI type	SE 8 bit

Settings

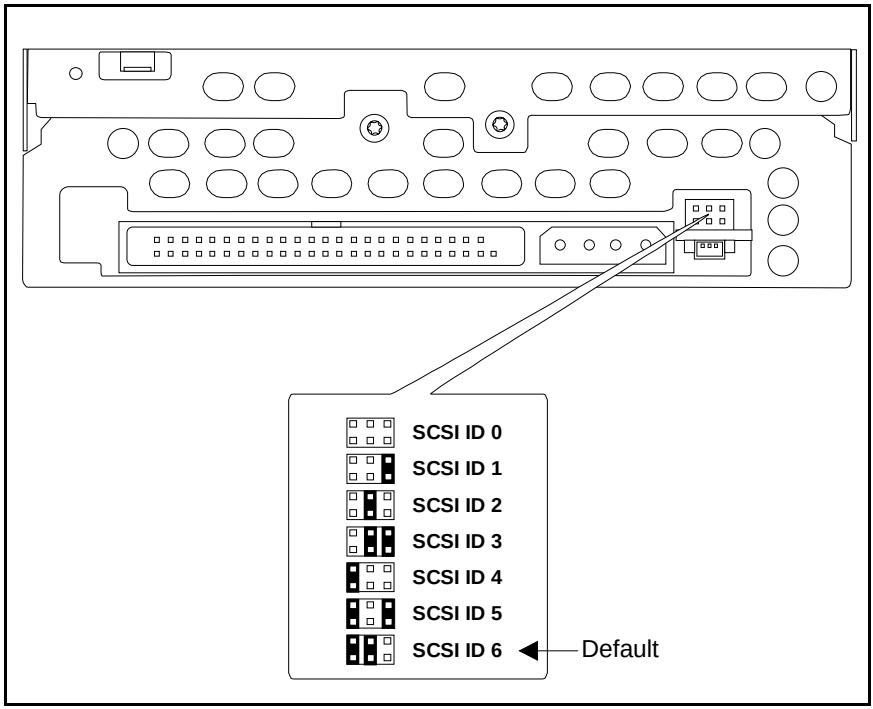


Figure 16: Settings for the 8 mm MTC drive (20/40 Gbyte)

5.3 Operating

The 8 mm, 20/40 Gbyte MTC drive has the following controls:

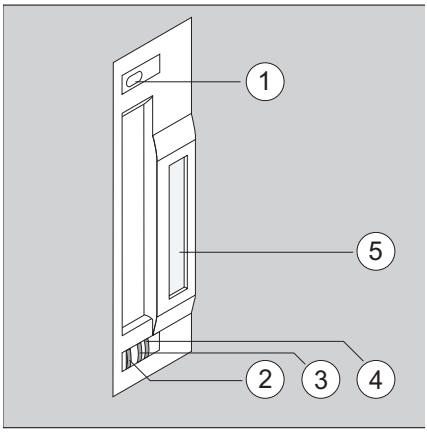


Figure 17: Controls: 8 mm 20/40 Gbyte MTC drive

(1) amber LED (error indicator)

(2) green LED (standby indicator)

(3) green LED (tape motion indicator)

(4) Release button

(5) LCD (Liquid Crystal Display)

Please note the following:

Only use EXATAPE-approved 8 mm magnetic tape cartridges. Other cartridges can cause problems. Information on approved 8 mm cartridges is provided in the chapter “Accessories” on page 87.

Lower capacity 8 mm magnetic tape cassettes (2.3/5 Gbyte) can be read by this MTC drive. You should, however, keep the number of read accesses to a minimum since these tapes cause considerably higher abrasion than the 20-Gbyte tapes. In addition, the drive must be cleaned after each such read procedure. If a lower capacity cassette has been read and a 20-Gbyte cassette is to be used subsequently, then the drive must be cleaned first. If the drive is not cleaned, then the drive will not accept this cassette and will eject it immediately.

5.3.1 Error indicator

The **error indicator** (2, amber LED) lights up when the system is powered up and is extinguished once the self-test has been passed successfully. It only flashes if the MTC drive has a fault. It is illuminated if the MTC drive requires cleaning.

Access to the drive will be blocked if the cleaning instructions are continually ignored.
Observe the correct sequence of actions for cleaning this MTC drive as described in the section “Cleaning the 4 mm cartridge tape drive” on page 82.

5.3.2 Standby indicator

The **standby indicator (3, green LED)** only lights up after the system has been powered up. It then flashes and is extinguished once the self-test of the drive has been passed successfully.

– The indicator flashes if a cartridge is mounted and the cartridge tape has not been spooled. The tape is wound round the read/write head.

– It does not glow if no cartridge is mounted.
Nor does it glow if a cartridge is mounted but the tape in the cartridge is not wound round the read/write head.

5.3.3 Tape motion indicator

The tape motion indicator **(4, green LED)** lights up when the system is powered up and is extinguished once the self-test has been successfully completed. It only flashes when the tape in the cartridge is being spooled.

Three different flashing speeds are identified:

– regular, slow flashes indicate a read/write procedure in streaming mode.

– regular, fast flashes indicate that the tape is spooling backwards or forwards.

– irregular flashes indicate that data is being loaded or unloaded or a read/write procedure in start/stop mode.

Do not press the release button of the MTC drive while the activity indicator is flashing, as data may be lost.

The reactions of the LEDs in certain situations are listed below.

Situation	Error indicator (2) (amber)	Ready indicator (3) (green)	Tape motion indicator (4) (green)
Power-on self-test or reset	**lights up**	**lights up**	**lights up**
Error	**flashes slowly**	**off**	**off**
Ready $\overline{\text{}}$ (tape not wound around magnetic head)	**off**	**off**	**off**
Ready (tape wound around magnetic head)	**off**	**lights up**	**off**
Read/write	**off**	**off**	**flashes slowly**
Read/write in start/stop mode	**off**	**off**	**flashes irregularly**
Spool forwards/backwards	**off**	**off**	**flashes rapidly**
Cleaning required	**lights up**	**off**	**off**
Cleaning in progress	**lights up**	**off**	**flashes slowly**

5.3.4 LCD

The LCD displays reset messages, status information and drive errors.

The following reset messages appear in sequence when the system unit in which the drive is installed is switched on:

Reset messages	**Meaning**
RESET	Basic drive setting (message appears when system unit is switched on or the SCSI bus is reset)
MODEL	Drive model name
SUBMOD	Drive software configuration (combination of letters and digits)
SN:	Drive serial number (combination of letters and digits)
CODE:	Drive firmware version (combination of letters and digits)
LAST CLEAN	The operating time (tape activity) since the last cleaning: e.g. 1.1 HRS
COMPRESS ON	Data compression is on or
COMPRESS OFF	Data compression is off
SINGLE-ENDED	Drive connected to system via single-ended SCSI port (i.e. 8 bit data transfer) or
DIFFERENTIAL	Drive connected to system via differential SCSI port (i.e. 16 bit data transfer)
WIDE	Drive has a WIDE-SCSI port (16 bits), higher data transmission rate than NARROW-SCSI or
NARROW	Drive has a NARROW-SCSI port (8 bits)
SCSI-ID	Drive identification on the SCSI controller

These messages are for information purposes only and do not require any action by the user.

The following status messages can be displayed for the drive in response to the appropriate actions:

Status messages	**Meaning**
READY–NO TAPE	Drive is ready, cassette can be inserted
LOADING	Drive is drawing in the cassette
READY-TAPE	Cassette has been drawn in, drive is ready for read/write procedures
EJECT	Eject button has been pressed, cassette will be ejected when the drive has completed the current operation
EJECT-PREVNT	Drive is set so that the software prevents the cassette from being ejected

These messages are for information purposes only and do not require any action by the user.

The following tape activity messages may appear while you are using the drive:

Tape activity messages	**Meaning – possible solution**
READ+	Drive reading data + sign means: data is compressed
WRITE+	Drive writing data, +- sign means: data is being compressed
PROTECTED	Cassette is write-protected, data cannot be written to the tape ► Remove cassette write protection, see page 46
ILLEGAL TAPE	Cassette cannot be accessed by the drive ► Use a different cassette (20 Gbyte)
SEARCH	Data is being searched for on the tape
REWIND	Tape is being rewound
ERASE	Data is being deleted

The following messages may appear while the tape is being cleaned:

Cleaning message	**Meaning – possible solution**
CLEAN REQD	Drive should be cleaned immediately
CLEANING...	Cleaning is in progress
USE NEW CARTRIDGE	The cleaning cassette is used up; the cassette will be ejected ► Use a new cleaning cassette
MUST CLEAN	Cleaning is essential (after a cassette with lower capacity has been used)

The following code loading messages may appear when new firmware is being loaded:

Code loading messages	**Meaning – possible solution**
LOADING CODE	New drive firmware is being loaded. If this is successful, the drive will execute an automatic reset
CODE LOAD FAIL RETRY CODE LOAD	Indicates that the LOADING CODE action has not been successful
MAKE CODE LOAD TP	Drive makes a copy of CODE LOAD on tape

You should contact your corresponding Service department if the suggested solutions to tape activity, cleaning and code loading messages are unsuccessful.

The following error messages may appear when a hardware error occurs:

Error messages	**Meaning - possible solution**
ERR	An error has occurred, possible error codes 1-15 Solution to error code: 1, 2, 3 Repeat UNIX command 4 Inform your corresponding Service 5 Remove cassette's write protection 6 Insert a new cassette and repeat the UNIX command 7 UNIX command has been issued without inserting a cassette 8 Inform your corresponding Service 9 Error due to dirt, clean drive, repeat command 10 Drive self-corrects 11 See error code 9 12 Inform your corresponding Service 13 1. Repeat UNIX command 2. Restart system 14 Use a different cassette 15 Inform your corresponding Service
PREV	Previous three errors, only of interest to your corresponding Service
ACTION	Suggested solution or description of problem

You should contact your corresponding Service organization if none of the suggested solutions is successful.

5.3.5 Inserting an 8 mm magnetic tape cartridge

- ► Check that no LED is illuminated or flashing.
- ► Look into the MTC drive to check that no cartridge is already inserted.
- ► With the window face up, push the cartridge into the drive slot until it is drawn in automatically.

If you insert the cartridge incorrectly you will feel some resistance. Do not then try to insert the cartridge forcefully into the drive!

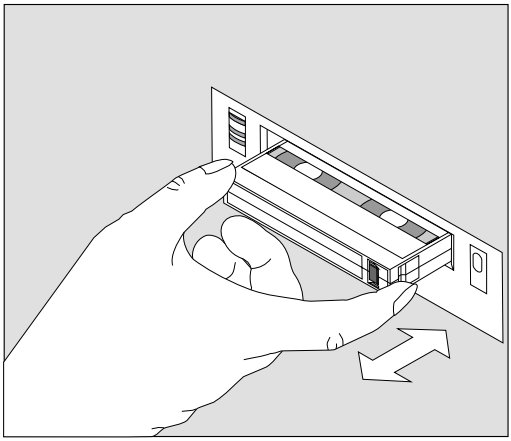


Figure 18: Inserting and removing a 8 mm magnetic tape catridge

If a cartridge is mounted you can access the drive using commands. It does not matter whether the ready indicator is bright.

5.3.6 Removing an 8 mm magnetic tape cartridge

Do not leave a cartridge in the drive any longer than absolutely necessary. Even small quantities of dust can cause damage during subsequent operation of the MTC drive.

- ► Make sure that the tape has stopped moving, i.e. the tape motion indicator (green LED) is no longer flashing and the ready indicator is bright.
- ► Press the release button. This causes the cartridge to be ejected. After you have pressed the button, the tape is first wound from the read/write head and the cartridge is then ejected automatically.
- ► Remove the cartridge.

6 Notes on 8 mm MTC drives

This section provides information on how to avoid problems during data backup, which magnetic tape cartridges are recommended, and how to handle the 8 mm magnetic tape cartridges correctly.

6.1 Tips for avoiding problems during data backup

If you observe a few important rules when using the 8 mm MTC drive and the appropriate cartridges, you will avoid problems with the drive and will have a reliable data backup device with an extraordinarily large capacity.

- Eliminate any sources of dust or other impurities in the vicinity of systems using 8 mm MTC drives. Paper and toner dust from printers and photo-copiers is particularly aggressive.
- Clean the MTC drive regularly and observe the sequence described in for this drive in the chapter on “Care and maintenance”. Failure to clean the drive or insufficient cleaning increases the read/write error rate, speeds up wear on the tape and the head drums and can even lead to contaminants being burned into the head drum. In this last case, even the use of a cleaning cartridge will not rectify the problem; the drive must be sent into the service center for cleaning and inspection.
- Only use the MTC drive in streaming mode. This means that data is written and read without stopping the tape.

  Wear on the magnetic tape drum and the tapes themselves is increased considerably if you do not observe this rule and instead use the MTC drive in start/stop mode.

  The MTC drive will operate in streaming mode if you perform backups at times when the load on the system is low and you specify the following block size in the backup command:

8 mm MTC drive (7 Gbyte)	block size ≥ 32Kbyte
8 mm MTC drive (20 Gbyte)	block size ≥ 64 Kbyte

In addition, you should observe the notes in the next section regarding care of magnetic tape cartridges.

6.2 Handling 8 mm magnetic tape cartridges

In order to achieve the best possible recording quality, it is recommended that the magnetic tape cartridges supplied by your local office are used (see the chapter “Accessories” on page 87). These cartridges are precisely matched to the characteristics of the drive.

Use exclusively magnetic tape cartridges approved by Fujitsu Siemens Computers and the manufacturer Exabyte® in the 8 mm MTC drive. Other magnetic tape cartridges can damage the MTC drive. Never use Video 8 cartridges.

The following magnetic tape cartridges are recommended:

8 mm MTC drive (7 Gbyte)	EXATAPE™, SONY QG112MA, SONY QG160MA
8 mm MTC drive (20 Gbyte)	EXATAPE™ AME 170m

Magnetic tape cartridges can be ordered directly by calling your local office (see the chapter “Accessories” on page 87).

6.2.1 Life of a magnetic tape cartridge

The life of a cartridge depends on the frequency with which the tape passes the read/write head. The number of “head passes” is proportional to the quantity of data transferred.

The following applies to 8 mm cartridges.

A maximum of **1500** head passes can be performed.

One backup requires three passes of the tape, since the tape is deleted, written and then rewound. This means that approx. **500** backup operations are possible.

If, however, each of these backups is read once, the life of an 8 mm cartridge is reduced to approx. **250** backup runs.

If the MTC drive is working in start/stop mode, i.e. if the tape is regularly stopped and the read/write head continues to revolve, the life of the cartridges is reduced dramatically.

6.2.2 Care of 8 mm magnetic tape cartridges

The **correct** way to care for magnetic tape cartridges is as follows:

- Always store magnetic tape cartridges in their original packaging.
- Before use, store magnetic tape cartridges in their operating environment for at least **24** hours. If magnetic tape cartridges have been exposed to high humidity or high temperatures, they must be stored in the operating environment for at least three or four days. Cartridges which have not been acclimatized are difficult to read and can attack the read/write head.

You should **never** treat a magnetic tape cartridge as follows:

- Do not expose cartridges to direct sunlight or heat. The specified storage temperature is between +5 °C and +32 °C. The ideal storage temperature, however is 20 °C ± 5 °C with a relative humidity between 30 % and 60 %.
- Do not allow magnetic tape cartridges to come into contact with magnetic objects.
- Do not use cleaning agents, solvents or thinners on magnetic tape cartridges.
- You should only leave an 8 mm cartridge in the MTC drive for as long as is necessary. Since the tape in the MTC drive remains wound around the read/write head, even small quantities of dust can cause damage to the MTC drive.

As a general rule

The following criteria cause a rapid reduction in the usability and reliability of magnetic tape cartridges and MTC drives:

– unacceptable temperatures
– sudden changes in temperature
– high dust levels (printer in the direct vicinity)
– inappropriate handling or storage of cartridges
– insufficient cleaning of MTC drives
– occasional use of inappropriate or spent tapes and cleaning materials.

6.2.3 Mechanical write protection for 8 mm magnetic tape cartridges

8 mm magnetic tape cartridges have a write protection facility on the long edge opposite the tape. Write protection is activated when the slider covers the aperture

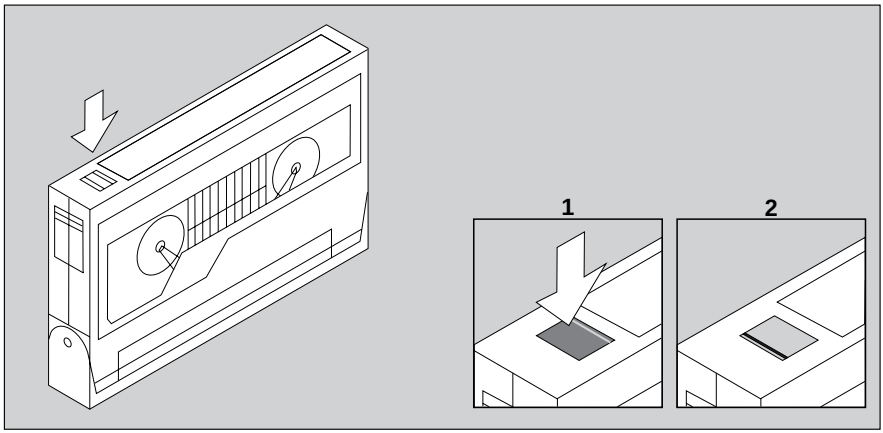


Figure 19: Mechanical write protection for 8 mm magnetic tape cartridges

(1) not write-protected

(2) write-protected

7 CD-ROM drive

A CD-ROM drive allows optical data media (CD-ROMs) to be read. A CD-ROM is read using a laser beam, with no contact with the disk itself. Unlike other data media, it is not possible to write to a CD-ROM (ROM = Read Only Memory).

In the world of Reliant UNIX® systems, CD-ROMs are used primarily for distributing software. Nowadays, however, a wide range of other information, such as directories of ZIP codes, spare parts catalogs and so on, is available on CD-ROM.

If the CD-ROM drive is already fitted in your system unit when shipped, the software is automatically installed and configured when the system is first started up. In this case you need not read the chapter entitled “Installation“.

7.1 Technical data

Name	OS29
Capacity	650 Mbyte
Height	Half height
Data format	High-Sierra or ISO 9660
Access time	90 ms
Data transfer rate	Max. 3.6 Mbyte/s (24 x speed)
SCSI bus address	ID 5 factory set

7.2 Installation

Installing the CD-ROM drive

The CD-ROM drive requires a half-size bay. It must only be operated horizontally.

► Install the CD-ROM drive as described under “Installing a drive“ in the technical description of your system unit’s product manual.

General information for the CD-ROM drive

Order unit	RM303-OS29 RM403-OS29	Net	650 Mbyte
Identification no.	88002.00.4.09	Gross	
Manufacturer	Sony CDU625	Height	5 ¼ inch
Type		Size	Half height
unix-dktype	OS29	UNIX release	Reliant UNIX 5.44B
Vendor string	SONY CD-ROM 6201B	SCSI type	SE 8 bit

Settings

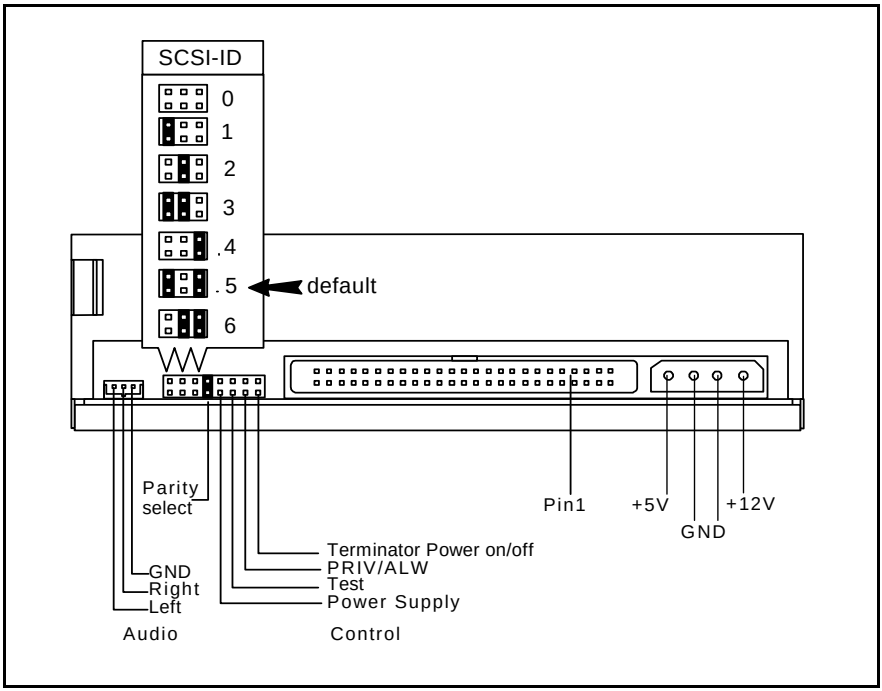
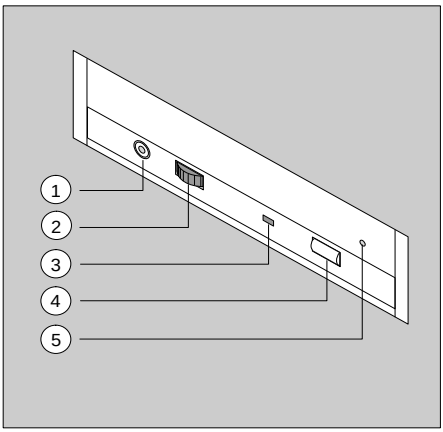


Figure 20: Settings for the CD-ROM drive

7.3 Operating

This CD-ROM drive **does not** require a caddy (special plastic carrier allowing you to insert a CD-ROM).

The CD-ROM drive has the following controls:



(1) Headphone connector

(2) Volume control

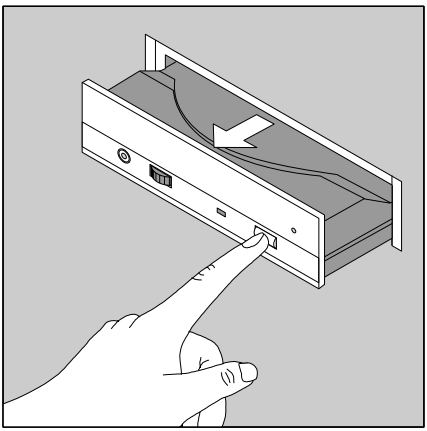
(3) Access indicator

(4) Release button

(5) Emergency eject button (recessed)

Figure 21: CD-ROM drive controls

Inserting a CD-ROM



► Press the release button. The drive tray opens automatically and remains open.

Figure 22: CD-ROM drive, opening the tray

► Place the CD-ROM on the tray with the printed side face up. Press the hole in the center of the CD-ROM onto the small raised round area in the center of the tray to ensure that it is located correctly.

► Push the release button one more time. Then the drive tray closes automatically.

Removing a CD-ROM

► Press the release button.

► Remove the CD-ROM.

Note that it is not possible to remove a CD-ROM while the CD-ROM drive is being accessed.

Removing a CD-ROM by hand in the event of a failure

In the event of a power failure or if the CD-ROM drive is damaged, it is possible for the CD-ROM to become stuck in the drive. If this happens, power down the system and remove the CD-ROM by hand as follows:

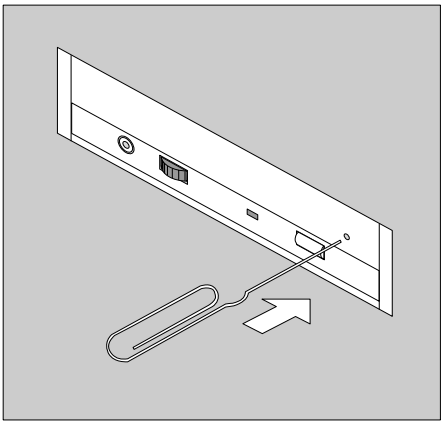


Figure 23: Removing a CD-ROM by hand

- ► Power down the system normally.
- ► Insert a hard object of approx. one millimeter diameter (e.g. a straightened paperclip) into the opening to the emergency eject button.
- ► Activate the eject mechanism with this object. The drive tray is ejected by a small amount. It can now be pulled out by hand.

7.4 Handling CD-ROMs

Since no physical contact with the CD is involved in reading CD-ROMs, they have a virtually unlimited lifetime. You must nevertheless observe a few points with regard to care.

Care of CD-ROMs

When you remove a CD-ROM from its package, you should observe the following rules:

- If the CD-ROM is dirty, you can clean the surface carefully with a soft, dry, clean cloth. Never use a damp cloth and never use cleaning agents or solvents. Vapor near the CD-ROM (such as ammonia) can cause damage. Most HiFi suppliers sell special cleaning cloths for CDs.
- CD-ROMs can be damaged by direct sunlight or excessive heat (> 55 °C). You should therefore never try to remove dirt using a hairdryer or similar. The maximum rate of temperature increase per hour is 15 °C.
- As with floppy disks, you must not bend or scratch the surface of a CD-ROM. Avoid shocks.

Always keep CD-ROMS in their original packaging if not used.

8 4 mm Autoloader

The 4 mm Autoloader, in the following abbreviated to autoloader, is designed to store up to 72 Gbytes (up to 144 Gbytes with compression) of data to multiple magnetic tape cartridges, e.g. in backup applications. The automatic changer mechanism provides for comprehensive, unattended data backup to several magnetic tape cartridges, e.g. during the night.

The magnetic tape cartridges, which are contained in a removable magazine, are selected either through buttons on the autoloader's front panel or by the software.

8.1 Technical data

Name	MC42	MC45
Height	Full height 5"	Full height 5"
Capacity	24 - 48 Gbytes	72 - 144 Gbytes
Recording format	DDS1, DDS2 and DDS-DC	DDS-1, DDS-2,DDS-DC and DDS-3
Recording speed	510 Kbytes/s (without data compression) up to 1.5 Mbytes/s (with data compression)	1 Mbyte/s (without data compression) up to max. 2 Mbyte/s (with data compression)

General information for MC42

Order unit	RM303-MC42	Net	24 / 48 Gbyte
Identification no.	54125.00.4.09	Gross	
Manufacturer	HP C1553-00150	Height	5 ¼ inch
Type	M444	Size	FH
UNIX type	MC42	UNIX release	Reliant UNIX 5.44
Vendor string	HP C1553A	SCSI type	SE 8 bit

General information for MC45

Order unit	RM303-MC45 RM403-MC45	Net	72 / 144 Gbyte
Identification no.	64125.00.4.09	Gross	
Manufacturer	HP C1557-00150	Height	5 ¼ inch
Type		Size	FH
UNIX type	MC45	UNIX release	Reliant UNIX 5.44B
Vendor string	HP C1557A	SCSI type	SE 8 bit

Settings

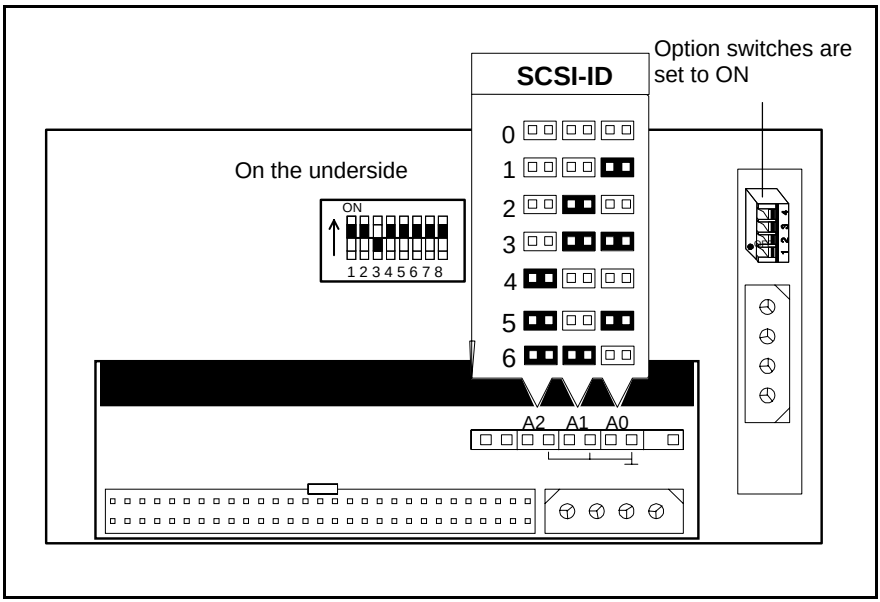


Figure 24: Settings for the 4 mm Autoloader

8.2 Autoloader modes of operation

The autoloader allows you to select magnetic tape cartridges in either of two ways:

Cartridge selection from the front panel (stacker mode)

A magnetic tape cartridge can be selected by pressing buttons on the autoloader's front panel and loaded from the magazine into the MTC (magnetic tape cartridge) drive.

In this mode, the changer mechanism is not controlled by the software but treated as a stand-alone MTC drive.

When the operation is complete, the magnetic tape cartridge is automatically (controlled by software) unloaded from the MTC drive and returned to the magazine. Then the changer mechanism automatically selects the next tape cartridge from the magazine and loads it into the MTC drive.

Cartridge selection from the host (random mode)

In this mode, the host which the autoloader is connected to views the autoloader as two devices:

1. A tape **drive** to which sequential access commands can be sent and
2. A tape **changer mechanism** to which medium changer commands can be sent.

The controlling host computer has full random access to any cartridge in the autoloader.

8.3 Front panel of the autoloader

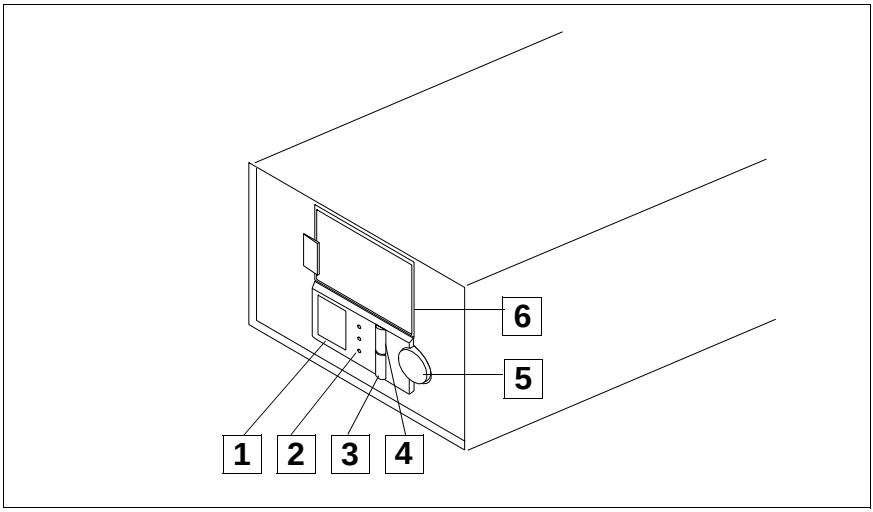


Figure 25: Controls on the autoloader front panel

(**1**) Liquid Crystal Display (LCD)

(**2**) Three LEDs

(**3**) Load Tape button

(**4**) Select button

(**5**) Eject button

(**6**) Magazine door

Liquid Crystal Display (LCD) (1)

The Liquid Crystal Display (LCD) provides information on loading (introducing a magnetic tape cartridge into the MTC drive) and unloading (removing a magnetic tape cartridge from the MTC drive and returning it to the magazine) as well as error messages.

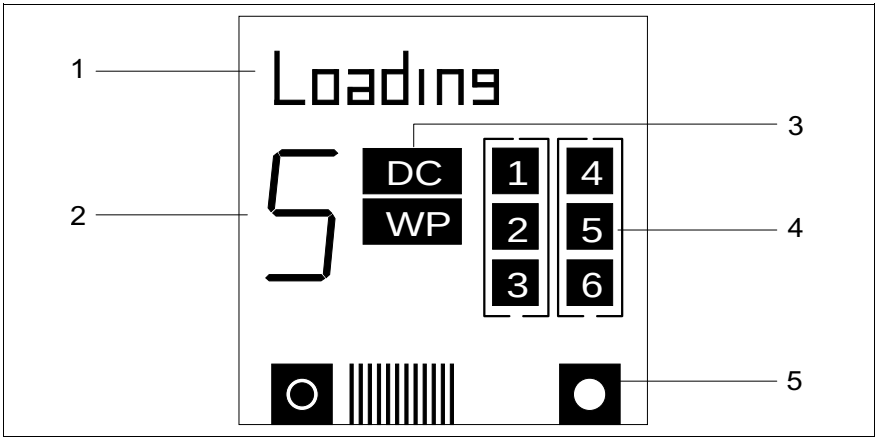


Figure 26: LCD displays

The LCD displays the following types of information:

(1) Status and error messages.

(2) Number of the current cartridge loaded in the MTC drive, or the selected cartridge.

(3) Indication of whether data compression is enabled (**DC**) or whether the cartridge is write-protected (**WP**)

(4) Number of the magazine slot containing a cartridge.

(5) Odometer (lines) showing how much tape has been used in the current partition.

Front panel lights (LEDs) (2)

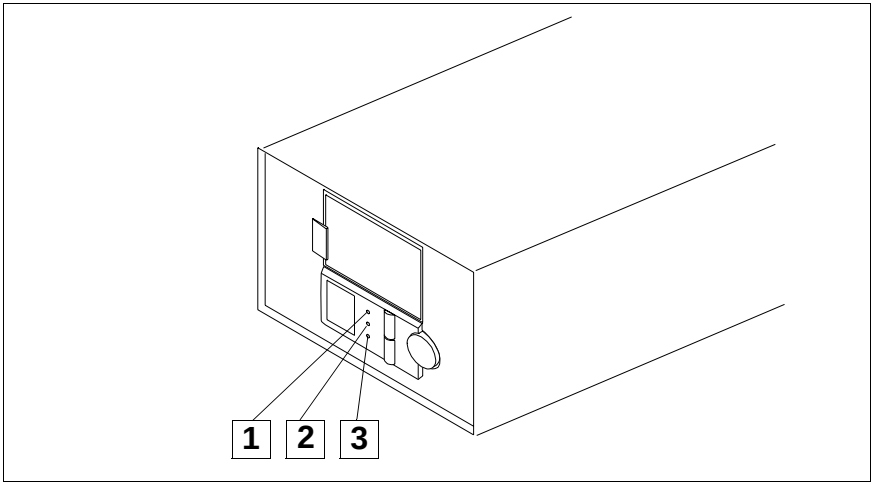


Figure 27: The LEDs

- Magazine Present LED (1)
  - The Magazine Present LED remains **steady green** when a cartridge magazine is installed in the autoloader.
  - The LED **flashes green** when a magazine is in the process of being installed, checked or ejected (unloaded) from the autoloader.
- Tape Activity LED (2)
  - The Tape Activity LED lights **steady green** when a cartridge is present in the MTC drive.
  - **Fast flashing green** (4Hz) means that data is being read or written or that activity other than the cartridge being loaded or unloaded is occurring (e.g. after power-up).
  - **Slow flashing green** (2Hz) means that a cartridge is being loaded into or unloaded from the MTC drive.
- Operator Attention Required LED (3)
  - The Operator Attention Required LED lights **steady amber** when a serious hardware error has occurred. You should notify your corresponding Service.
  - **Flashing amber** indicates that one of the following user-recoverable errors has occurred:

– The read/write heads need cleaning.
– The tape is nearing the end of its useful life.
– There is a cartridge in the autoloader but no magazine is ready to accept it.
– The front panel door is open when it should not be.
– A firmware upgrade is taking place.
– A hardware fault has occurred which the MTC drive could not clear.

Appropriate error messages are displayed on the LCD (see the section “Status and error messages” on page 64).

Load Tape button (3)

The Load Tape button is used to load a selected cartridge from the magazine into the MTC drive and then initiate a stacker mode backup. When the cartridge is full, it is unloaded from the MTC drive and returned to the magazine. The autoloader will then automatically take the next higher numbered cartridge and load it into the MTC drive.

Select button (4)

To select a specific magnetic tape cartridge, press the Select button as often as required.

Eject button (5)

The Eject button starts the unload process. The drive unloads the currently loaded cartridge, and the changer mechanism returns it to the magazine. The magazine is then ejected. This button can also be used to force an ejection in an emergency.

You are strongly advised not to force ejection because it may cause loss of data (see the section “Forcing ejection” on page 62).

The Eject button may be disabled by the software to prevent unauthorized persons from operating the autoloader.

Magazine door (6)

The magazine doorcovers the slot through which the magazine, loaded with magnetic tape cartridges, is inserted to perform a backup.

8.4 Loading/unloading the magazine and cartridges

The processes of loading and unloading are defined as follows:

Loading: A magnetic tape cartridge is loaded when it is in the MTC drive mechanism and the tape is threaded around the read/write head. The MTC drive is ready to accept and execute read/write commands.

Semi-loaded: A magnetic tape cartridge is semi-loaded when it is in the MTC drive mechanism but the tape is not threaded around the read/write head. The drive is off-line in this state.

Unloaded: A magnetic tape cartridge is unloaded when it is moved from the MTC drive and replaced in the magazine. No read or write commands can be issued in this state.

Make sure that the magazine label is in the label area to avoid obstruction of the changer mechanism.

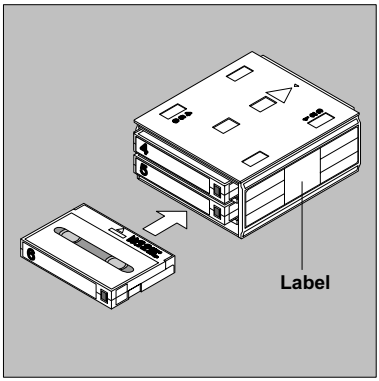


Figure 28: Magazine label

Loading cartridges into the magazine

Use only “DDS Media Recognition System” cartridges in the drive.

Between one and six magnetic tape cartridges can be placed in any of the magazine slots. It is recommended, however, to place the first cartridge in slot 1 because during a sequential backup the drive will attempt to load the first cartridge from slot 1, by default.

- ► Place the required number of cartridges into the magazine with the arrows on the cartridges pointing towards the center of the magazine.

Magnetic tape cartridges and replacement magazines can be ordered directly by calling your local office (see the chapter “Accessories” on page 87 for the order numbers).

Applying light pressure, slide the magazine into the door-covered slot on the front of the autoloader until the mechanism pulls it in automatically.

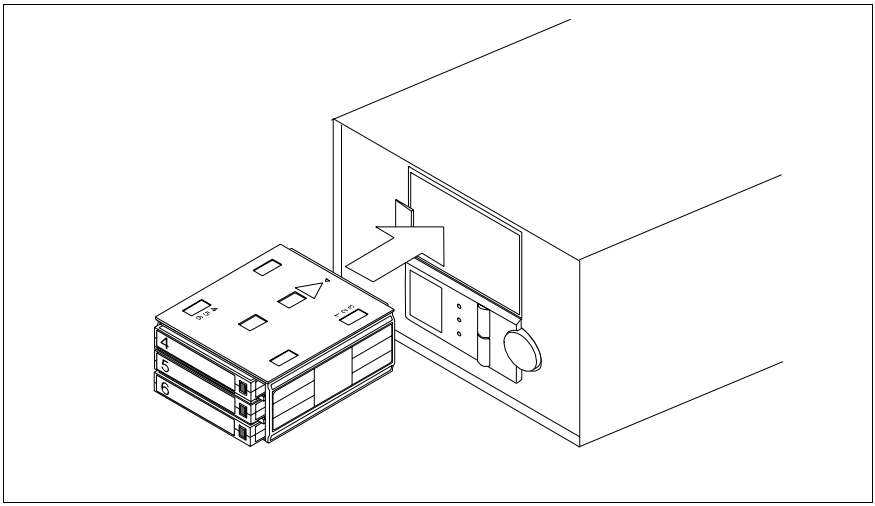


Figure 29: Loading the magazine and cartridges into the front slot of the autoloader

The autoloader will then check which magazine slots contain a cartridge.

Loading cartridges into the autoloader

You can load magnetic tape cartridges in either of two ways:

- Using the buttons on the front panel of the autoloader or
- Controlled by the host software

Any cartridge which is not DDS Media Recognition System will be treated as write-protected.

Unloading the magazine and cartridges

When you press the Eject button on the front panel of the autoloader, the cartridge is unloaded, i.e. moved from the MTC drive mechanism and replaced in the magazine:

– The tape is rewound to the beginning of media (BOM) and unthreaded.

– The changer mechanism returns the cartridge to the magazine.

– The magazine is ejected.

The cartridge can also be unloaded by a command from the host. The same procedure is followed but the magazine is not ejected at the end.

The Eject button can be disabled by the software to prevent unauthorized users from operating the autoloader.

Forcing ejection

Before you force ejection of a cartridge from the autoloader, read the following caveats:

You can lose data if you force an eject. Also, forced ejection may interrupt drive activities, leaving the tape invalidly formatted.
Never use forced ejection as a quick way of obtaining a cartridge. Only force an eject as a last resort to recover a cartridge when all attempts to eject the magazine and cartridges in the normal way have failed.

However, if you need to unload a cartridge, even at the risk of losing data, proceed as follows:

► Hold the Eject button down for at least 5 seconds.

The LCD will display *Force Eject*.

The autoloader waits 35 seconds to give the normal eject procedure a chance to occur. Once this time has elapsed, the tape is unthreaded and the cartridge ejected from the MTC drive, regardless of what operation the drive was performing. The cartridge is then returned to its slot in the magazine, and the MTC drive is reset as though the power had been cycled. If no cartridge is loaded in the MTC drive, the magazine will be ejected following the 35 seconds.

8.5 Status and error messages

This chapter discusses the status and errors messages displayed on the LCD (see figure 26 on page 57).

8.5.1 Functional fields of the autoloader

The status messages that appear on the LCD cover five functional fields of the autoloader operation.

The following table shows the status messages in each functional field and indicates how control of the LCD passes to the next field. The messages in brackets are not displayed on the LCD as control has already passed to the next functional field.

Functional field	Message	Meaning
Reset	Self Test	The autoloader is performing its power-on self-test.
	(Test O.K.)	
Firmware upgrade state	FW Upgrade	Firmware upgrade data is being read either through a tape or the SCSI bus.
	FW Check	Firmware upgrade data is being checked for compatibility.
	FW Program	The embedded MTC drive is being upgraded with the new firmware.
	New FW!!!!	The firmware upgrade process has been successfully completed.
	(No Upgrade)	
Magazine load state	Insert Mag	The autoloader is ready to accept a magazine.
	Mag Check	The autoloader is examining the magazine to find which slots are occupied.
	Mag Eject	The autoloader is ejecting the magazine
	(Mag Loaded)	

Functional field	Message	Meaning
Cartridge load state	Mag Loaded	The magazine present in the autoloader has been checked.
	SemiLoaded	A cartridge is in the MTC drive, but not loaded (the tape has not been threaded).
	Loading	Either a cartridge is being moved from the magazine and placed into the MTC drive, or the drive is loading a semi-loaded cartridge.
	Unloading	Either the MTC drive is unloading a cartridge, or a semi-loaded cartridge is being ejected from the MTC drive and replaced in the magazine.
	Cleaning	A cleaning cartridge has been loaded into the MTC drive.
	(Tape Loaded)	
Tape motion state	Ready *xx*m	A cartridge has been loaded in the MTC drive, and the drive is ready for tape motion commands. *xx*m is the length of the currently loaded tape, so *Ready 90 m* will be displayed, when a 90 m tape is loaded.
	Read	The MTC drive is reading data from the tape.
	Write *x.y*	The MTC drive is writing data to the tape.*x.y:1* is the cumulative compression ratio since power-on, or since the compression ratio was last cleared. For example, *Write 2.1* means a compression ratio of 2.1:1. The compression ratio will only be displayed after about 1 megabyte of data has been written since power-on.
	Search >>	The MTC drive is searching for a record, filemark, setmark or EOD (End of Data) towards the end of the tape (i.e. it is responding to a SCSI *SPACE* command with a positive count field).

Functional field	Message	Meaning
	Search <<	The MTC drive is searching for a record, filemark, setmark or BOD (Beginning of Data) towards the beginning of the tape (i.e. it is responding to a SCSI *SPACE* command with a negative count field).
	Rewind	The MTC drive is rewinding the tape to the Beginning of Partition (BOP).
	Format	A SCSI command for generating a 1 or 2-partition tape is being executed, or the MTC drive is changing the size of the partitions on an existing 2-partition tape.
	Erase	The MTC drive is erasing data from the tape.
	Locate	The MTC drive is moving the tape to a point specified by the software.
	Partition	The MTC drive is switching to the other partition on a 2-partition tape.

If a write-protected cartridge is loaded, the *Ready xxm* message is alternated with the *Read Only* message.

8.5.2 Additional information messages

In addition to the messages listed above, the LCD shows the following information messages:

Message	Meaning
C1553A	Product identifier. It is displayed for 2 seconds during power-up.
ForceEject	A forced eject is in progress (see the section “Forcing ejection” on page 62). The message finishes when the magazine is ejected.
SCSI ID: x	x is the SCSI address of the autoloader. It is displayed for 2 seconds following the product identifier.
Config: xxx	*xxx* is the value of the configuration switches. It is displayed for 2 seconds following the SCSI ID.
Stray Tape: Insert Empty Mag	A cartridge is present in the autoloader, but there is no magazine present. Insert an empty magazine to retrieve the cartridge.
Select Tape	This is displayed when the Select button is pressed, and for a short time after the button is released.
Load Tape	This is displayed when the Load Tape button is pressed.
Eject Mag	This is displayed when the Eject button is pressed.

8.5.3 Error messages of the autoloader

This subsection describes some error messages together with the suggested course of action.

If an error is detected in the changer mechanism or there is a risk that data may be lost, the error message on the LCD may be accompanied by the Operator Attention Required LED showing on the front panel of the autoloader.

Operator Attention Required LED is off

Error message	Meaning	Status/action
AT BOD	A *SPACE* command encountered BOD unexpectedly.	The tape is now positioned at the Beginning of Data (BOD).
AT EOD	A *READ* or *SPACE* command encountered EOD unexpectedly.	The tape is now positioned at the End of Data (EOD).
Tape has DC data	A *READ* command has encountered compressed data, but the MTC drive is not configured to decompress data. The host may have disabled data compression, or the hardware is configured incorrectly.	Check that the host has not disabled data compression. Change the autoloader configuration, or notify your corresponding Service.
Media Removal Prevented	An eject command has been attempted when media removal prevention is in force.	Try again when the media removal prevention has been removed.
Partition 1 too large	A command to format the tape has failed because the requested partition 1 size is too large.	Try again with a smaller partition 1, or a longer tape.
SCSI Error	A SCSI command error has been detected.	Check the SCSI interface connection and try again.
Tape Full	A *READ*, *SPACE*, *WRITE* or *WRITE FILEMARKS* command encountered EOP unexpectedly.	End of Partition (EOP) has been reached. The required data may be on the next cartridge.

Operator Attention Required LED is flashing amber

Error message	Meaning	Status/action
Bad Media	A *READ* or *SPACE* command has failed because the tape is not in DDS format.	Use a DDS tape.
Clean Me	A high error rate has been detected reading or writing.	Insert a cleaning cartridge to clean the read/write heads.
Close Door	The front panel door is open. Any autoloader motion will be delayed.	Close the front panel door.
Eject Fail	An eject command has failed.	Use a new cartridge, or try forcing an eject. See the section “Forcing ejection” on page 62
FW Data Err	The autoloader has failed to upgrade the firmware because the new firmware is corrupt.	Obtain a good copy of the firmware upgrade.
Force Eject	A force eject is in progress.	See the section “Forcing ejection” on page 62.
FW Read Fail	A firmware upgrade failed because of an error in reading data from the tape.	Try again. If it still fails, notify your corresponding Service.
FW Tape Write Protected	A firmware upgrade failed because the tape is write-protected.	Change the write-protect tab on the cartridge and try again.
FW Write Fail	A firmware upgrade failed because of an error in writing a modified upgrade count to the tape.	Try again, if it still fails, notify your corresponding Service.
Illegal FW	The autoloader has failed to upgrade the firmware because the new firmware is incompatible.	Obtain a correct version of the firmware upgrade.

Error message	Meaning	Status/action
Illegal HW	The autoloader has failed to upgrade the firmware because the new firmware is for incompatible hardware.	Obtain a correct version of the firmware upgrade.
Load Fail	A load command has failed, or a load or change partitions command has failed to read the system area of the tape.	Use a new cartridge.
Error X	The mechanism has jammed. *X* gives the reason for the jam.	Press the Eject button to recover cartridge and magazine. If the problem persists, notify your corresponding Service and tell them the value of *X*.
No EOD mark	A *READ* command has encountered blank tape, i.e. no DDS-format EOD pattern has been recognized.	This is probably a result of a power failure while writing to tape.
Tape Position Lost	A *WRITE*, *READ*, *SPACE* or *REWIND* command has failed to complete. The tape is positioned on the far side of the bad groups.	Reposition and try again.
Read Fail	A read has failed.	Reposition the tape and try again.
Tape Fault	The cartridge in the MTC drive is faulty, possibly because the tape has snapped, or the cartridge has an invalid pattern of identification holes.	Use a new cartridge.
Tape Stuck	The cartridge is stuck in the MTC drive.	Try forcing an eject. See the section “Forcing ejection” on page 62. If this fails, notify your corresponding Service.

Error message	Meaning	Status/action
UpgradeErr	The autoloader has failed to download an upgrade of the firmware via SCSI.	Check the SCSI connection and try again.
Write-Protected Tape	A *WRITE*, *WRITE FILEMARK* or *ERASE* command has been attempted on a write-protected tape.	Remove the tape and change it to write-enabled.
Cannot Write Non-MRS Tape	A *WRITE*, *WRITE FILEMARK* or *ERASE* command has been attempted on a non-Media Recognition System tape.	Remove the tape and replace with a Media Recognition System tape.
Worn Media	A high error rate has been detected writing, suggesting that the tape is nearing the end of its useful life.	Replace the cartridge with a new one.
Write Fail	A *WRITE*, *WRITE FILEMARK* or *ERASE* command has failed.	Use a new cartridge.

Operator Attention Required LED is steady amber

Error message	Meaning	Status/action
Drive Comms Error	Communication between the MTC drive and changer mechanism is disturbed.	Notify your corresponding Service.
FRU 1 Dead	The controller board for the embedded MTC drive has failed its self-test.	Notify your corresponding Service.
FRU 2 Dead	The embedded drive mechanism has failed its self-test.	Notify your corresponding Service.

9 Hard disk drives

The hard disks are supplied in a 3 1/2“ slide-in drive unit (hot-replaceable frame). With these hard disks no further jumper settings are required. The SCSI ID is determined via the slot.

A sticker on the slide-in drive unit provides information on the type of the hard disk.

9.1 Hard disk drive MP48

General information

Order unit	RM390-MP48	Capacity	4.5 Gbyte
Identification no.	64167.07.0.09	Connector type	80 pin
Manufacturer	Quantum	Size	3 ½ inch
Type	XP34550J	Speed	7200 rpm
UNIX type	MP48	UNIX release	Reliant UNIX 5.44B
Vendor string	QUANTUM XP34550J	SCSI type	SE 16 bit - ultra1

9.2 Hard disk drive MP98

General information

Order unit	RM390-MP98	Capacity	9.1 Gbyte
Identification no.	64177.07.3.09	Connector type	80 pin
Manufacturer	Quantum	Size	3 ½ inch
Type	XP39100J	Speed	7200 rpm
UNIX type	MP98	UNIX release	Reliant UNIX 5.44B
Vendor string	QUANTUM XP39100J	SCSI type	SE 16 bit - ultra1

9.3 Hard disk drive HD02

General information

Order unit	RM390-HD02	Capacity	4.5 Gbyte
Identification no.	74167.00.0.09	Connector type	SCA 80 pin
Manufacturer	Seagate	Size	3 ½ inch
Type	ST34501WC	Speed	10000 rpm
UNIX type	hd02	UNIX release	Reliant UNIX 5.44B
Vendor string	Seagate ST34501WC	SCSI type	SE 16 bit - ultra1

9.4 Hard disk drive HD04

General information

Order unit	RM390-HD04 RM490-HD04	Capacity	9.1 Gbyte
Identification no.	74173.00.3.09	Connector type	SCA 2, 80 pin
Manufacturer	Seagate	Size	3 ½ inch
Type	ST39102LC	Speed	10000 rpm
UNIX type	hd04	UNIX release	Reliant UNIX 5.44B
Vendor string	Seagate ST39102LC	SCSI type	LVD

9.5 Hard disk drive HD05

General information

Order unit	RM390-HD05	Capacity	9.1 Gbyte
Identification no.	74177.00.3.09	Connector type	SCA2 80 pin
Manufacturer	Seagate	Size	3 ½ inch
Type	ST19101WC	Speed	10000 rpm
UNIX type	hd05	UNIX release	Reliant UNIX 5.44B
Vendor string	Seagate ST19101WC	SCSI type	SE 16 bit - ultra1

9.6 Hard disk drive HD07

General information

Order unit	RM390-HD07 RM490-HD07	Capacity	18.2 Gbyte
Identification no.	74183.00.3.09	Connector type	SCA 2, 80 pin
Manufacturer	Seagate	Size	3 ½ inch
Type	ST118202LC	Speed	10000 rpm
UNIX type	hd07	UNIX release	Reliant UNIX 5.44B
Vendor string	Seagate ST118202LC	SCSI type	LVD

9.7 Hard disk drive HD11

General information

Order unit	RM390-HD11 RM490-HD11	Capacity	4.5 Gbyte
Identification no.	74165.07.6.09	Connector type	SCA 2, 80 pin
Manufacturer	Seagate	Size	3 ½ inch
Type	ST34573LC	Speed	7200 rpm
UNIX type	hd11	UNIX release	Reliant UNIX 5.44B
Vendor string	Seagate ST34573LC	SCSI type	LVD

9.8 Hard disk drive HD14

General information

Order unit	RM390-HD14 RM490-HD14	Capacity	9.1 Gbyte
Identification no.	84173.07.3.09	Connector type	SCA 2
Manufacturer	Seagate	Size	3 ½ inch
Type	ST39173LC	Speed	7200 rpm
UNIX type	hd14	UNIX release	Reliant UNIX 5.44B
Vendor string	Seagate ST39173LC	SCSI type	LVD

9.9 Hard disk drive HD17

General information

Order unit	RM390-HD17 RM490-HD17	Capacity	18 Gbyte
Identification no.	84183.07.3.09	Connector type	SCA 2
Manufacturer	Seagate	Size	3 ½ inch
Type	ST118273LC	Speed	7200 rpm
UNIX type	hd17	UNIX release	Reliant UNIX 5.44B
Vendor string	Seagate ST118273LC	SCSI type	LVD

9.10 Hard disk drive HD24 - OLR

General information

Order unit	RM490-HD24	Capacity	9.1 Gbyte
Identification no.	74243.03.5.09	Connector type	SCA 2, 80 pin
Manufacturer	Fujitsu	Size	OLR frame
Type	MAG3091LC	Speed	10000 rpm
UNIX type	hd24	UNIX release	from Reliant UNIX 5.44C20
Vendor string	Fujitsu MAG3091LC	SCSI type	16 Bit LVD/SE Ultra2

9.11 Hard disk drive HD27 - OLR

General information

Order unit	RM480-HD27 RM490-HD27	Capacity	18.2 Gbyte
Identification no.	84273.00.4.09	Connector type	SCA 2, 80 pin
Manufacturer	Seagate	Size	OLR frame
Type	ST318275LC	Speed	7200 rpm
UNIX type	hd27	UNIX release	from Reliant UNIX 5.43C40
Vendor string	Seagate ST318275LC	SCSI type	16 Bit LVD/SE Ultra2

9.12 Hard disk drive HD28 - OLR

General information

Order unit	RM490-HD28	Capacity	18 Gbyte
Identification no.	74283.03.7.09	Connector type	SCA 2, 80 pin
Manufacturer	Fujitsu	Size	OLR frame
Type	MAG3182LC	Speed	10000 rpm
UNIX type	hd28	UNIX release	from Reliant UNIX 5.44C20
Vendor string	Fujitsu MAG3182LC	SCSI type	16 Bit LVD/SE Ultra2

9.13 Hard disk drive HD38 - OLR

General information

Order unit	RM490-HD38	Capacity	36 Gbyte
Identification no.	74383.03.6.09	Connector type	SCA 2, 80 pin
Manufacturer	Fujitsu	Size	OLR frame
Type	MAF3364LC	Speed	10000 rpm
UNIX type	hd38	UNIX release	from Reliant UNIX 5.44C20
Vendor string	Fujitsu MAF3364LC	SCSI type	16 Bit LVD/SE Ultra2

9.14 Hard disk drive HD54 - OLR

General information

Order unit	RM480-HD54 RM490-HD54	Capacity	9.1 Gbyte
Identification no.	84243.00.5.09	Connector type	SCA 2, 80 pin
Manufacturer	Seagate	Size	OLR frame
Type	ST39175LC	Speed	7200 rpm
UNIX type	hd54	UNIX release	from Reliant UNIX 5.43C40
Vendor string	Seagate ST39175LC	SCSI type	16 Bit LVD/SE Ultra2

10 Equipment care

Your local office offers a comprehensive range of cleaning and maintenance products for your system. The chapter “Accessories” on page 87ff lists the various products together with their order numbers.

Before you start cleaning work, switch off all equipment and make sure it will not be restarted.

Make sure that no water gets inside the equipment.

Never use sprays, abrasive powder or cleaning agents which dissolve synthetic materials.

10.1 Cleaning the CD-ROM drive

The CD-ROM is maintenance-free and does not require any special cleaning.

10.2 Cleaning cartridge tape drives

The intervals at which you need to clean the cartridge tape drives are based on the length of time they are in use, the quality of the tapes and the environmental conditions.

Inadequate cleaning or none at all increases the read/write error rate and causes accelerated wear to the tape materials and the head drums, even to the extent of particles of dirt being burnt into the head drum. If particle burn-in occurs, the problem cannot simply be solved by using a cleaning cartridge. You then need to send the drive to the your corresponding Service Center for cleaning and inspection.

Always clean the read/write head after using a new tape, because tape abrasion may lead to read/write errors.

10.2.1 Cleaning the quarter-inch cartridge tape drive

Clean the read/write head of the quarter-inch cartridge tape drive with the appropriate cleaning kit at the following intervals:

in use eight hours per day:	clean every day
used briefly every day:	clean once a week
used once a week:	clean every month

10.2.2 Cleaning the 4 mm cartridge tape drive

Clean the read/write head of the 4 mm cartridge tape drive, using only the appropriate cleaning cartridge, at the following intervals:

in use five to six hours per day:	clean twice a week
in use three to four hours per day:	clean once a week
in use no more than two hours per day:	clean every two weeks

If the error indicator flashes, you must clean the drive immediately to prevent damage from dust particles.

The error indicator also flashes if, following a successful cleaning operation, you use a tape on which the error rate is already too high. Please clean the drive again if this is the case and do not use the offending tape again.

The cleaning process takes approximately 30 seconds. If the cleaning cartridge is ejected sooner, it is empty. In this case repeat the process with a new cleaning cartridge.

Each cleaning cartridge can be used a total of 40 times. Note down on the cleaning cartridge each time you use it so that you know when it is due to run out.

Follow the instructions given on the packaging of the cleaning cartridge.

10.2.3 Cleaning the 8 mm cartridge tape drive

If the error indicator flashes (on MTC drive 8 mm 7 Gbyte) or glows (on MTC drive 8 mm 20 Gbyte), you should clean the drive as soon as possible, since even small amounts of dust can impair the functioning of the drive.

You should clean the drive at least once a month or after a maximum of 30 hours' use.

Only use cleaning cartridges that have been approved by Fujitsu Siemens Computers and EXABYTE. Otherwise, the magnetic heads of the drive may be damage

The following cleaning cartridges should be used:

– for MTC drive MC15: Premium cleaning cartridge 18c
– for MTC drive MC75: Mammoth cleaning cartridge 18c

Depending on its type, a cleaning cartridge must only be used 12 or 18 times (Premium), or 18 times (Mammoth).

Do not exceed the maximum number of permissible cleaning procedures. Otherwise, the drive or the read/write heads may be damaged.

Clean the 8 mm MTC drive as follows:

► Insert the cleaning cartridge.

Depending on the operating system, either cleaning starts automatically or you must enter the following command at shell level:

► clean8mm *devicename*

This starts the cleaning operation. The operation takes approx. 1-2 minutes. Once the cleaning operation is complete, the cleaning cartridge is ejected automatically.

► Remove the cleaning cartridge.

► Note the date on the label provided.

This completes the cleaning operation.

You will find further information on cleaning on the cover of the cleaning cartridge.

11 Troubleshooting

The following pages describe problems that may occur when you are using the drives and suggest ways of solving them.

If the recommended actions are unsuccessful, try rebooting (switch the system unit off and after about 10 seconds switch it back on again).

If rebooting does not help, inform your corresponding Service. Record all the activities which may have caused the problem and any actions you have taken so far in attempting to eliminate it.

Quarter-inch cartridge tape drive

Problem	Possible cause	Recommended solution
Cannot read cartridge	Drive door not properly closed	Close drive door
	Defective cartridge	Try another cartridge
	Wrong type of cartridge	Use right type of cartridge
	Incorrect data format	Select correct data format (e.g. *tar, cpio*)
Cannot write to cartridge	Drive door not properly closed	Close drive door
	Cartridge write-protected	Disable write protection
	Defective cartridge	Try another cartridge
	Wrong type of cartridge	Use right type of cartridge
Cartridge does not rewind when inserted	Defective cartridge	Try another cartridge
	Defective drive	Inform your corresponding Service
Access LED does not light up	Device not addressed correctly	Use right device name
	Defective drive	Inform your corresponding Service

4 mm and 8 mm cartridge tape drives

Problem	Possible cause	Recommended solution
Cannot read cartridge	Defective cartridge	Try another cartridge
	Dirty read/write heads	Clean heads
	Wrong type of cartridge	Use right type of cartridge
	Incorrect data format	Select correct data format
	Wrong device driver	Use proper device driver
Cannot write to cartridge	Cartridge write-protected	Disable write protection
	Dirty read/write heads	Clean heads
	Wrong type of cartridge	Use right type of cartridge
	Incorrect data format	Select correct data format
	Wrong device driver	Use proper device driver
Access LED does not light up	Device not addressed correctly	Use right device name
	Defective drive	Inform your corresponding Service

CD-ROM drive

Problem	Possible cause	Recommended solution
Cannot read CD-ROM	CD-ROM dirty	Clean CD-ROM
	Accessing wrong drive	Access right drive
	CD-ROM wrongly positioned in drive	Position CD-ROM properly in drive
Access LED does not light up	Device not addressed correctly	Use right device name
	Defective drive	Inform your corresponding Service

12 Accessories

For information on ordering accessories, contact your local your corresponding office. The tables on the following pages list the available items.

Tape cartridges

	Order number
Quarter-inch cartridge, 155 MB	106 0000 3137
Quarter-inch cartridge, 525 MB	106 0000 3141
4 mm cartridge (90 m), 2 GB	106 0000 3142
4 mm cartridge (120 m), 4 GB	106 0000 3143
4 mm cartridge (125 m), 12 GB	106 0000 3454
8 mm cartridge, 7/14 GB	106 0000 3144
8 mm cartridge, 20/40 GB	106 0000 4459
Magazine for 4 mm Autoloader (MC42)	106 0000 3100

Optical disks

	Order number
Magneto-optical disk, 650 MB	106 0000 3148
Magneto-optical disk, 1.3 GB	106 0000 3150
Magneto-optical disk, 2.6 GB	106 0000 3098

Cleaning kits

	Order number
Cleaning cartridge for quarter-inch cartridge drive	106 0000 3332
Cleaning cartridge for 4 mm cartridge drive	106 0000 3258
Cleaning cartridge for 8 mm cartridge drive (7/14 GB) (EXABYTE Premium 18c)	106 0000 3112
Cleaning cartridge for 8 mm cartridge drive (20/40 GB) (EXABYTE Mammoth 18c)	106 0000 4461
Special cleaner TUC (Tape Unit Clean) for environmentally friendly, CFC-free cleaning of cartridge tape devices	106 0000 3334
Professional cleaning set for DP equipment with monitor and plastic cleaner, fleece cloths.	106 0000 3259

Figures

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http://manuals.mchp.siemens.de

Comments
Suggestions
Corrections

Submitted by

Comments on RM300 E / RM400 E (Reliant UNIX)
Storage Devices

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