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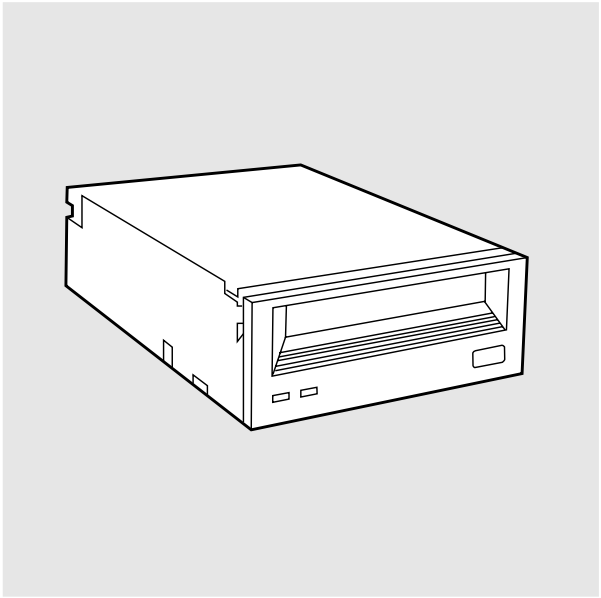
# HP DDS DRIVES

User Guide



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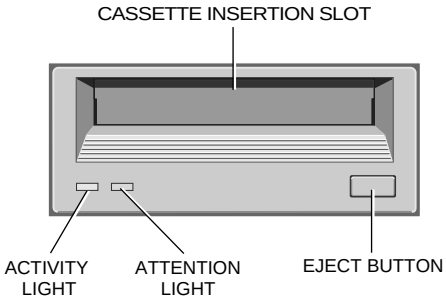
# USING A HP DDS TAPE DRIVE

This document describes the HP DDS-2/3 tape drives. The software needed to control the drives depends on your operating environment; ask your supplier for details.

The drive has a built-in compression algorithm which can typically double, and in some cases quadruple, tape capacity. Data compression and decompression is transparent to the host software.




The DDS-2 drive uses 120-metre (DDS-2) cassettes and the DDS-3 drive uses 125-metre (DDS-3) cassettes. Both drives can use earlier DDS format cassettes (the DDS-3 drive can read DDS-2 cassettes, but not vice versa). The drive automatically detects the format of the cassette when it is inserted into the drive.

It has the capability to read and write both DDS uncompressed and DDS-DC compressed data and data cartridges.

The drive writes compressed data by default, unless it finds uncompressed data already on the cassette. The drive can also write uncompressed data under software control. When reading a cassette, the DDS drives automatically distinguishes compressed and uncompressed data and either decompresses it or passes it through unaltered as appropriate.

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**Caution**

*Use only cassettes bearing the DDS or DDS MRS (Media Recognition System) symbols; you cannot play audio DAT cassettes with these drives, even on multimedia systems.*

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| | DDS-1 (without compression) | DDS-1 (with compression) | DDS-2 | DDS-3 |
|---|---|---|---|---|
| **Capacity (2:1compression)** | | | | |
| DDS-1 60m cassette | 1.3 GB | 2.6 GB | 2.6 GB | 2.6 GB |
| DDS-1 90m cassette | 2.0 GB | 4.0 GB | 4.0 GB | 4.0 GB |
| DDS-2 120m cassette | N/S | N/S | 8.0 GB | 8.0 GB |
| DDS-3 125m cassette | N/S | N/S | N/S | 24 GB |
| **Transfer Rate** | | | | |
| Max. Sustained Native | 183 KB/s | 183 KB/s | 510 KB/s | 1 MB/s |

N/S=not supported

**Note**

*To gain full advantage of your DDS drive you should use matching cassettes. That is, use DDS-3 cassettes with the DDS-3 drive. This allows the drive to store the maximum amount of data on the tape.*

## Interpreting the LED indicators

There are two LED (light-emitting diode) indicators on the drive's front panel. The Activity (green) and Attention (amber) LEDs show the status of the drive.

| Green | Amber | Drive status |
|---|---|---|
| Flashing | Off | Power-on, or cassette load/unload |
| Flashing rapidly | Off | Cassette read/write |
| On | Off | Cassette loaded |
| Any | Flashing | Media Caution signal |
| Any | On | Hardware error or high humidity |

### Media Caution

A media caution signal, when the Attention LED (amber) flashes, indicates that the tape may be becoming unreliable, although at this point no data has been lost. First, clean the tape head cylinder with the special cleaning cassette, then try the data

cassette again. If the warning persists, copy the data onto a new cassette and discard the old one. The media caution signal will clear when a new cassette is loaded or when the drive is switched off and then back on.

A media caution signal can also indicate that a prerecorded audio DAT cassette has been inserted by mistake.

#### Hardware error or high humidity

If the Drive Busy (amber) LED flashes rapidly, this indicates either a hardware error or dew (high humidity). If this happens soon after powering-up the computer, the drive's diagnostic test may have failed, in which case the drive will not operate. Request help from your supplier or an authorized maintainer.

If the drive detects high humidity, the tape is automatically ejected. As soon as the drive detects that the humidity is at an acceptable level, it will return to normal operation. When high humidity is detected, you should allow approximately 1 hour for the drive to acclimatize before trying again.

### Automatic drive operation

To prolong the life of the tape and the drive mechanism, the drive "relaxes" during periods of inactivity (no read or write operations):

- After 30 seconds, the capstan and pinch roller are released and tape tension is removed.
- After 90 seconds, the tape is pulled away from the head cylinder, and the cylinder stops rotating.

### Inserting a cassette

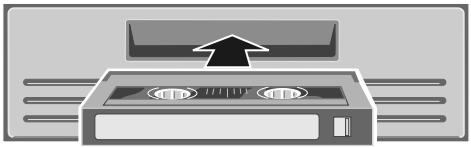
Insert the cassette into the slot with the triangular arrowhead on the cassette uppermost, and pointing towards the drive. As the tape is inserted, the drive takes it and automatically loads it

into the drive mechanism. A load sequence checks ambient humidity, the tape format and data integrity. Unless the tape is blank the tape log, which contains a history of usage of the tape, is read into the drive's memory.

The drive will automatically format a blank tape when data is first written to it. Remember to allow time for the formatting process when you use a new tape.

## Removing a cassette

Before attempting to remove a cassette, ensure that the drive is not currently in use (the amber Drive Busy indicator must be unlit).



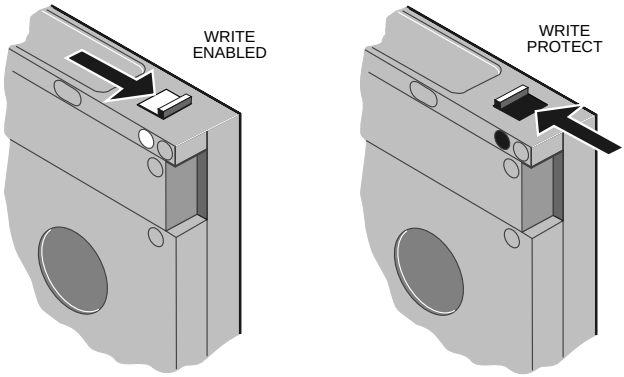
Press the EJECT button on the front of the drive (depending on your operating environment, the EJECT button may be disabled while the drive is in use). If the tape is write-enabled, a copy of the tape log, held in the drive's memory, is written back to tape. The drive rewinds to the beginning of the tape, unthreads it, and ejects the cassette. Several seconds may pass between the button being pressed and the cassette being ejected, so be careful not to turn off the computer before the operation is completed.

## Write-protecting a cassette

A cassette can be write-protected by sliding the white tab on the cassette so that the recess is revealed. In this position, data can be read from the tape but not written to it.

The tape log, which includes a record of data integrity failures, cannot be updated while the cassette is write-protected. It follows that the tape log becomes inaccurate if a cassette is used while write-protected, and the media warning LED status cannot be relied upon to determine if the cassette needs to be copied and replaced.

Keep your cassettes well away from magnetic objects, and equipment that generates magnetic fields. Avoid extremes of temperature and exposure to direct sunlight; otherwise, the data recorded on the tape may become corrupted




## Cleaning the drive

The read/write heads in the tape drive are protected during normal operation by a built-in cleaning roller. In addition, a special cleaning cassette, HP 92283K is available from your supplier. This cassette should be used:

- After the first 4 hours of tape movement of a new cassette.
- Every 25 operating hours.
- When the Media Caution signal is displayed.

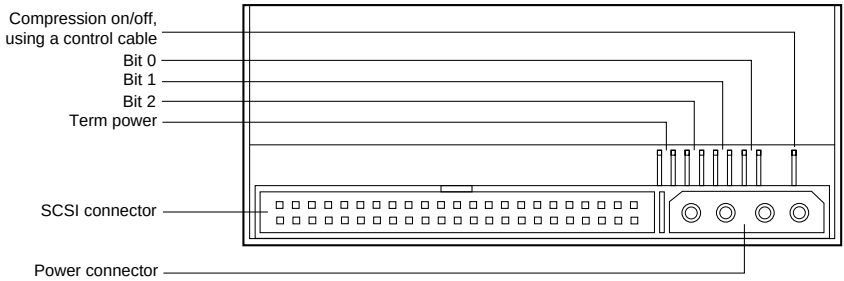
When you insert the cleaning cassette, the drive recognises it as a cleaning cassette, runs it for about 30 seconds, then ejects it automatically. Each time the cleaning cassette is used the tape advances over an unused portion of the tape. If the drive ejects the cleaning cassette immediately after you insert it, this means that the entire tape has been used and a new cleaning cassette is required. You cannot rewind a cleaning cassette.

**Caution**

*Do **not** attempt to use an ordinary audio DAT cleaning cassette. The drive will be unable to recognise it as a cleaning cassette.*

## Setting the SCSI ID

The SCSI ID is set using jumpers on the set of pins beside the SCSI connector at the rear of the drive, as shown below:




### SCSI Jumper Pins

The three significant bits in the ID give a range of 0 through 7 as follows:

| SCSI ID | Bit 2 | Bit1 | Bit0 |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 |
| 2 | 0 | 1 | 0 |
| 3 | 0 | 1 | 1 |
| 4 | 1 | 0 | 0 |
| 5 | 1 | 0 | 1 |
| 6 | 1 | 1 | 0 |
| 7 | 1 | 1 | 1 |

1=shorted

0=open

The drive reads the SCSI ID at power-up and during self-test.

### Data Compression Control

Data compression can be controlled through the jumper pin shown above. The pin is only monitored at power-on, and controls whether data compression is enabled by default. Any subsequent change to the pin are ignored.

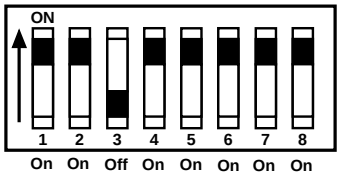
| Pin State | Effect |
|---|---|
| Unconnected | This is the default. Data compression is controlled by configuration switches 1 and 2 (on the underside of the drive) and through the SCSI MODE SELECT command. |
| Connected to 0V | Data compression is disabled. The setting of configuration switch 1 is ignored. Switch 2 is valid. However, data compression can still be controlled through MODE SELECT. Note that when reading, the drive will always decompress compressed data.<br><br>It follows from this that if you wish to use this pin, you should set configuration switch 1 on the underside of the drive to ON. |

### Terminator Power

The drive will provide termination power for the SCSI termination resistors if a jumper is set across the two pins marked "Term power" as shown in the diagram.

## Configuration switches

There is a set of configuration switches on the underside of the drive, shown overleaf:




With the drive switched off, use the information below to select the correct configuration for your system.

*Note*

*For the drive to operate correctly, appropriate drivers and application software must be loaded on the host computer.*

### Data compression

Switches 1 and 2 are normally a used to configure the way in which data compression is set for the drive. The following table shows the available options:

| Switch 1 | Switch 2 | Meaning |
|---|---|---|
| On | On | Compression enabled at power-on with host control |
| On | Off | Compression enabled at power-on no host control. |
| Off | On | Compression disabled at power-on. The host is allowed to control compression. |
| Off | Off | Compression disabled at power-on no host control. |

When switch 1 is on, data written to the tape will be compressed without the knowledge of the host.

### Media Recognition System (MRS)

Switch 3 is used to configure the drive to respond to DDS Media Recognition System tapes:

| Switch 3 | Meaning |
|---|---|
| On | The Media Recognition System is disabled. All DDS tapes are treated the same, whether they possess the Media Recognition stripes or not. |
| Off | The Media Recognition System is active. This is the default setting. Non Media Recognition System tapes are treated as if they are write-protected. |

### Switches 4 to 8

Switches 4 to 8 are used to specify connectivity and functionality according to host or customer requirements. The default settings for all switches is on.

## Specification of HP DDS tape drives

Performance specifications apply when using data compression. Power specifications are measured at the tape drive power connector and are nominal values.

The compression ratio and transfer rate achievable in any particular case depend on the characteristics of the data being compressed.

| | | |
|---|---|---|
| *Nominal capacities* | 60-metre cassette (DDS) | 1.3 Gbyte (1:1 base)<br>2.6 Gbyte (2:1 typical)<br>5.2 Gbyte (4:1 max[1]) |
| | 90-metre cassette (DDS) | 2.0 Gbyte (1:1 base)<br>4.0 Gbyte (2:1 typical)<br>8.0 Gbyte (4:1 max[1]) |
| | 120-metre cassette (DDS-2) | 4.0 Gbyte (1:1 base)<br>8.0 Gbyte (2:1 typical)<br>16.0 Gbyte (4:1 max[1]) |
| | 125-metre cassette (DDS-3) | 12.0 Gbyte (1:1 base)<br>24.0 Gbyte (2:1 typical) |
| *Transfer rates* | DDS | 366 Kbyte/s (1:1 base)<br>732 Kbyte/s (2:1 typical)<br>1464 Kbyte/s (4:1 max[1]) |
| | DDS-2 | 400 Kbyte/s (1:1 base)<br>800 Kbyte/s (2:1 typical)<br>1608 Kbyte/s (4:1 max[1]) |
| | DDS-3 | 1000 Kbyte/s (1:1 base)<br>2000 Kbyte/s (2:1 typical) |

[1] *Nominal maximum only; can be exceeded for highly-compressible data. Note DDS-3 standard is only on the DDS-3 drive.*

| | | |
|---|---|---|
| *Unrecoverable errors* | | Less than 1 in $10^{15}$ data bits |
| *Recording format* | | ANSI/ECMA (DDS-DC, DDS-2/3) |
| *Power specification* | Voltage | +12 Vdc ± 10%<br>+5 Vdc ± 5% |
| | Ripple | +12 V: <=150 mVp-p<br>+5 V: <= 150 mVp-p |
| | Current (operational) | 0.4 A @ +12 Vdc, 0.8 A @ +5 Vdc |
| | Current (peak) | 0.9 A @ +12 Vdc, 1 A @ +5 Vdc |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