

Eurotech Tape Drive Information

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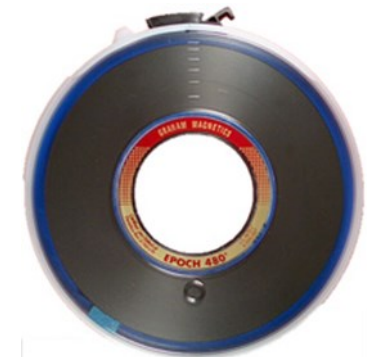
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There are four formats with different recording densities that yield different capacities per cartridge type:

Enterprise Format 1 (EFMT1)

Used by the 3592 J1A Tape Drive, and the 3592 E05 Tape Drive in both native and J1A emulation mode.

This format records 512 tracks on 8 channels.

The 3592 E06 Tape Drive, and 3592 E07 Tape Drive with code level D3I3_5CD or higher, reads data written in EFMT1 format but does not write in EFMT1.

Enterprise Format 2 (EFMT2)

Used by the 3592 E05 Tape Drive, and the 3592 E06 Tape Drive.

This format records

896 tracks on 16 channels.

The 3592 E07 Tape Drive with code level D3I3_5CD or higher, reads data written in EFMT2 format but does not write in EFMT2.

When operating on encrypted data at this density, the recording format is Enterprise Encrypted Format 2 (EEFMT2).

Enterprise Format 3 (EFMT3)

Used by the 3592 E06 Tape Drive and the 3592 E07 Tape Drive.

This format records

1152 tracks on 16 channels.

When operating on encrypted data at this density, the recording format is Enterprise Encrypted Format 3 (EEFMT3).

Enterprise Format 4 (EFMT4)

Used by the 3592 E07 Tape Drive.

This format records

664 tracks on JB and JX cartridges and

2176 tracks on JC, JK, and JY cartridges on 32 channels.

When operating on encrypted data at this density, the recording format is Enterprise Format 4 (EEFMTA4).

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The 3592 J1A Tape Drive

Reads and writes EFMT1 format only.

The 3592 E05 Tape Drive

Reads and writes EFMT1 and EFMT2 formats in native mode.

Reads and writes EFMT1 format in J1A emulation mode.

The 3592 E06 Tape Drive

Reads and writes EFMT2 and EFMT3 formats.

Reads EFMT1 format.

Operates only in native mode.

Drive Mode Setting	Formats read	Format used when writing and cartridge is at BOT	Format used when writing and cartridge is not at BOT	Model type reported to host in response to Inquiry command
J1A	EFMT1	EFMT1	EFMT1	J1A
Native E05	EFMT1 and EFMT2	EFMT1 and EFMT2	EFMT1 and EFMT2	E05
E05 emulating J1A	EFMT1	EFMT1	EFMT1	J1A
E06/EU6	EFMT1, EFMT2, and EFMT3	EFMT2 and EFMT3	EFMT2 and EFMT3	E06
E07 with code level D3I3_5CD or higher	EFMT1, EFMT2, EFMT3, and EFMT4	EFMT3 and EFMT4	EFMT3 and EFMT4	E07

The 3592 E07 Tape Drive

Reads and writes EFMT3 and EFMT4 formats

(EFMT3 can only be written using JB and JX media and EFMT4 format can only be written using JB, JX, JC, JY, and JK media).

Reads EFMT2 format and with code level D3I3_5CD or higher, EFMT1 format.

Operates only in native mode

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Supported Cartridge Types:

The 3592 E07 Tape Drive:

Uses the Advanced Data (type JC) and Advanced WORM (write-once, read-many) (type JY) cartridges.

Both the type JC and JY cartridges have a maximum native capacity of 4000 GB.

With code level D3I3_5CD or higher, can read EFMT2 format but does not write in EFMT2.

With code level D3I3_5CD or higher, can only read cartridge types JA, JW, JJ and JR.

Uses the 3592 Advanced Economy (type JK) cartridge with a maximum native capacity of:

500 GB using EFMT4 format.

The 3592 tape drive models E07, E06, and E05:

Use 3592 Extended Data (type JB) and Extended WORM (type JX) with a maximum capacity of:

1600 GB using EFMT4 format,

1000 GB using EFMT3 format, and

700 GB using EFMT2 format.

The 3592 tape drive models E07, E06, E05, and JIA use:

3592 Standard Data (type JA) and Standard WORM (type JW) cartridges with a maximum native capacity of:

640 GB using EFMT3 format,

500 GB using EFMT2 format, and

300 GB using EFMT1 format.

3592 Economy Data (type JJ) and Economy WORM (type JR) cartridges with maximum native capacity of:

128 GB using EFMT3 format,

100 GB using EFMT2 format, and

60 GB using EFMT1 format.

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3592—Tape Drive Emulation Mode Support (Page 4 of 7)

The 3592 tape drive automatically reformats media when the tape is written while positioned at BOT, such as when writing the tape label, if the tape does not match the drive format. In such a case, the tape is reformatted to match the 3592 tape drive.

The manual reformat process varies by operating system but usually includes running a program to issue the Mode Select command.

The 3592 J1A Tape Drive (or the E05 emulating the J1A) can reformat an EFMT2 or EFMT3 tape to EFMT1.

The native 3592 E05 Tape Drive can reformat an EFMT1, EFMT3, or EFMT4 tape to EFMT2 and reformat an EFMT2 or EFMT3 tape to an EFMT1 when writing from beginning of tape (BOT).

The 3592 E06 Tape Drive does not support emulation but can read tapes in EFMT1, EFMT2, and EFMT3 format, and write in EFMT2 and EFMT3 format.

The 3592 E06 Tape Drive can reformat any EFMT1, EFMT2, EFMT3, and EFMT4 tape to EFMT3 format when writing from BOT.

The 3592 E07 Tape Drive does not support emulation but can read in EFMT1 with code level D3I3_5CD or higher, EFMT2, EFMT3, and EFMT4 format, and write in EFMT3 and EFMT4 format. The 3592 E07 Tape Drive can reformat any compatible EFMT2, EFMT3, or EFMT4 tape to EFMT3 or EFMT4 format when writing from BOT.

3592	EFMT1	EFMT2	EFMT3	EFMT4
	512 Tracks - 8 Channels	896 Tracks - 16 Channels	1152 Tracks - 16 Channels	2176 Tracks - 32 Channels
Model J1A	R/W	Not supported	Not supported	Not supported
Model E05	R/W ¹	R/W	Not supported	Not supported
Model E06 ²	R	R/W	R/W	Not supported
Model E07 ²	R ⁴	R ⁴	R/W ³	R/W

¹ Model E05 can read and write EFMT1 operating in native or J1A emulation mode.

² Model E06 and E07 do not support emulation

³ Cartridge types JB and JX only.

⁴ Model E07 can read JA, JJ, JR, and JW cartridge types only with code level D3I3_5CD or higher

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Feature	3592 tape drives			
	TS1140 (Model E07)	TS1130 (Model E06 or EU6)	TS1120 (Model E05)	Model J1A
Native sustained data rate	250 MB/s (E07 format) 160 MB/s (E06 format)	160 MB/s (E06 format) 140 MB/s (E05 format) 70 MB/s (J1A format)	100 MB/s (E05 format) 50 MB/s (J1A format)	40 MB/s (J1A format)
Compressed sustained data rate (at maximum compression)	650 MB/s (E07 format)	350 MB/s (E06 format)	280 MB/s (E05 format)	120 MB/s (J1A format)
Native Capacity	4 TB (3.64 TiB) ¹ 1.6 TB (1.46 TiB) ² 500 GB (465.66 GiB) ⁵	1 000 GB (931.32 GiB) ² 640 GB (596.05 GiB) ³ 128 GB (119.21 GiB) ⁴	700 GB (651.93 GiB) ² 500 GB (465.66 GiB) ³ 100 GB (93.13 GiB) ⁴	300 GB (279.39 GiB) ³
Write-once-read-many (WORM) capability	Yes			
Capacity scaling and short cartridge	Yes			
Read/write capability	If encryption-enabled, reads and writes Model E07 and Model E06 encrypted format	If encryption-enabled, reads and writes Model E06 and Model E05 encrypted format	Reads and writes Model E05 format	Reads and writes Model J1A format
	Reads and writes Model E07 and Model E06 format	Reads and writes Model E06 and Model E05 format	Reads and writes Model J1A format	
	Reads Model E05	Reads Model J1A format		
Host (server) attachment	Supports dual-port, 8 Gbps Fibre Channel interface	Supports dual-port, 4 Gbps Fibre Channel interface		Supports dual-port, 2 Gbps Fibre Channel interface
	Maximum interface burst transfer rate of 800 MB/s	Maximum interface burst transfer rate of 400 MB/s		Maximum interface burst transfer rate of 200 MB/s
	Supports N and L ports with autoconfigure			
Encryption	All TS1140 tape drives are encryption capable	All TS1130 tape drives are encryption capable	With feature code 9592 or 5592	Not supported

Text on product label and type of media ¹	Native capacity				Case color	Label, door, and write-protect switch color	Part number
	E07	E06/EU6	E05	J1A			
Data, JA	640 GB (596.04 GiB) E06 format	640 GB (596.04 GiB) E06 format	500 GB (465.66 GiB) E05 format	300 GB (J1A format)	Black	Dark blue	18P7534
	500 GB (465.66 GiB) E05 format	500 GB (465.66 GiB) E05 format					
	300 GB (279.39 GiB) J1A format (See note 5.)	300 GB (279.39 GiB) J1A format	300 GB (279.39 GiB) J1A format				
Extended Data, JB	1600 GB (1490.12 GiB) E07 format	1 000 GB (931.32 GiB)	700 GB (651.93 GiB)	Not supported	Black	Dark green	23R9830
	1000 GB (931.32 GiB) E06 format						
Advanced Data, JC	4000 GB (3725.29 GiB) E07 format	Not supported	Not supported	Not supported	Black	Dark purple	46X7452
Economy, JJ	128 GB (119.21 GiB) E06 format	128 GB (119.21 GiB) E06 format	100 GB (93.13 GiB) E05 format	60 GB (58.88 GiB) J1A format	Black	Light blue	24R0316
	100 GB (93.13 GiB) E05 format	100 GB (93.13 GiB) E05 format					
	60 GB (58.88 GiB) J1A format (See note 5.)	60 GB (58.88 GiB) J1A format	60 GB (58.88 GiB) J1A format				

Advanced Economy, JK	500 GB (465.66 GiB) E07 format	Not supported	Not supported	Not supported	Black	Light purple	46X7453
Economy WORM, JR	128 GB (119.21 GiB) E06 format	128 GB (119.21 GiB) E06 format	100 GB (93.13 GiB) E05 format	60 GB (J1A format)	Platinum (silvery gray)	Light blue	24R0317
	100 GB (93.13 GiB) E05 format	100 GB (93.13 GiB) E05 format					
	60 GB (58.88 GiB) J1A format (See note 5.)	60 GB (58.88 GiB) J1A format	60 GB (58.88 GiB) J1A format				
WORM, JW	640 GB (596.04 GiB) E06 format	640 GB (596.04 GiB) E06 format	500 GB (465.66 GiB) E05 format	300 GB (279.39 GiB) J1A format	Platinum (silvery gray)	Dark blue	18P7538
	500 GB (465.66 GiB) E05 format	500 GB (465.66 GiB) E05 format					
	300 GB (279.39 GiB) J1A format (See note 5.)	300 GB (279.39 GiB) J1A format	300 GB (279.39 GiB) J1A format				
Extended WORM, JX	1600 GB (1490.12 GiB) E07 format	1 000 GB (931.32 GiB)	700 GB (651.93 GiB)	Not supported	Platinum (silvery gray)	Dark green	23R9831
	1000 GB (931.32 GiB) E06 format						
Advanced WORM, JY	4000 GB (3725.29 GiB) E07 format	Not supported	Not supported	Not supported	Platinum (silvery gray)	Dark purple	46X7454
Cleaning, CLNxxxJA ³	N/A ⁴	N/A	N/A	N/A	Black	Gray	18P7535

3590—All figures are based on native mode

	3590 B	3590 B-Ultra	3590 E	3590 H
Data Transfer Rate	13 MB/s	13MB/s	13 MB/s	13 MB/s
Read Formats	FMT3590	FMT3590	FMT3590 FMT3590E	FMT3590, FMT3590E, FMT3590H
Write Formats	FMT3590	FMT3590	FMT3590E	FMT3590H
Data Capacity - type J tape	10GB	10GB	20GB	30GB
Data Capacity - type K Tape	20GB	20GB	40GB	60GB
Type J tape	High Performance cartridges - have a blue leader block assembly and blue labels			
Type K tape	Extended High Performance cartridges - have a green leader block assembly and green labels.			

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3480/3490—Example Compatibilities

Model	18-Track		18-Track (compressed)		36-Track		128-Track	
	Read	Write	Read	Write	Read	Write	Read	Write
IBM								
3490-F11	X	X	X	X	X	X		
3490-F01	X	X	X	X	X	X		
3490-F00	X	X	X	X	X	X		
3490-E11	X		X		X	X		
3490-E01	X		X		X	X		
Fujitsu								
M8100							X	X
M2485K/N	X		X		X	X		
M2483K/N	X		X		X	X		
M2488C	X		X		X	X		
M2488E	X	X	X	X	X	X		
M2485H	X	X	X	X				
M2483H	X	X	X	X				
M2485B	X	X						
M2483B	X	X						
M2481B	X	X						

Density	Approx Capacity
3480	200 - 300 MB
3490	600 MB - 900 MB
3490E	800 MB - 1.2 GB

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LTO—All figures are based on native mode

Compatibility	LTO 6	LTO 5	LTO 4	LTO 3	LTO 2	LTO 1
LTO 6	R/W	R/W	R/O			
LTO 5		R/W	R/W	R/O		
LTO 4			R/W	R/W	R/O	
LTO 3				R/W	R/W	R/O
LTO 2					R/W	R/W
LTO 1						R/W

	LTO 6	LTO 5	LTO 4	LTO 3	LTO 2	LTO 1
Capacity	2.5TB	1.5TB	800GB	400GB	200GB	100GB
Speed MB/s	160	140	120	80	40	20
Media	Thin Film	Thin Film	Thin Film	Metal Particle	Metal Particle	Metal Particle
Recording method	Linear serpentine	PRML	PRML	PRML	PRML	RLL 1.7
Encryption capable	Yes	Yes	Yes			
Worm capable	Yes	Yes	Yes	Yes		
Tape tracks	2176	1280	896	704	512	384
Tracks written/pass	16	16	16	16	8	8

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DLT/SDLT—All figures based on native mode

Drive transfer rates												
	DLT2000	DLT2000XT	DLT4000	DLT7000	DLT8000	DLT1	DLT-S4	DLT VS80	DLT VS160	SDLT220	SDLT320	SDLT600
Native Capacity	10	15	20	35	40	40	800	40	80	110	160	300
Transfer rate MB/s	1.25	1.25	1.5	5	6	3	60	3	8	11	16	36
Media Compatibility												
	DLT2000	DLT2000XT	DLT4000	DLT7000	DLT8000	DLT1	DLT-S4	DLT VS80	DLT VS160	SDLT220	SDLT320	SDLT600
Super DLT Capacity										Read/Write 110GB	Read/Write 160GB	Read
DLT Tape VS1 Capacity									Read/Write 80GB			Read
DLT Tape IV Capacity			Read/Write 20GB	Read/Write 35GB	Read/Write 40GB			Read/Write 40GB	Read	Read	Read	
DLT Tape III XT Capacity		Read/Write 15GB	Read/Write 15GB	Read/Write 15GB	Read/Write 15GB							
DLT Tape III Capacity	Read/Write 10GB	Read/Write 10GB	Read/Write 10GB	Read/Write 10GB	Read/Write 10GB							

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DDS/DAT

	Media						
Drive	DAT320	DAT160	DAT72	DDS4/DAT40	DDS3	DDS2	DDS1
DAT320 Drive	R/W	R/W					
DAT160 Drive		R/W	R/W	R/W			
DAT72 Drive			R/W	R/W	R/W		
DDS4 Drive				R/W	R/W	R/W	R
DDS3 Drive					R/W	R/W	R/W
DDS2 Drive						R/W	R/W
DDS1 Drive							R/W

Format	Native Capacity	Data Transfer Speed
DAT-320	160 GB	12 MB/s
DAT-160	80 GB	6.9 MB/s
DAT-72	36 GB	3.2 MB/s
DDS-4	20 GB	3.2 MB/s
DDS-3	12 GB	1.1 MB/s
DDS-2	4 GB	0.6 MB/s
DDS-1	2 GB	0.18 MB/s

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Exabyte

Drive	Native capacity	Transfer rate	Format				
			Mammoth	8500c	8500	8200c	8200
Mammoth 2	45GB	12MB/s	R/W	R			
Mammoth (8900)	20GB	3MB/s	R/W	R	R		R
Eliant 820 (8500 mode)	7GB	1MB/s		R/W	R/W		R
EXB-8505	5GB	2MB/s		R/W	R/W	R/W	R/W
EXB-8205	2.5GB	1MB/s				R/W	R/W

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9 Track—Approximate Capacity per Tape Length/Density (Page 1 of 3)

Tape Length	Density/Capacity			
	800 NRZI	1600 PE	3200 PE	6250 GCR
1200'	10 MB	20 MB	40 MB	80 MB
2400'	20 MB	40 MB	80 MB	160 MB
3600'	30 MB	60 MB	120 MB	220 MB

800 NRZI Non return to zero, inverted

1600 PE Phase Encoded

3200 PE Phase Encoded

6250 GCR Group Code Recording

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9 Track Media Comparison (Page 2 of 3)

Working on a capacity of 200MB for a 3600ft (1100m) long 9 track tape written at 6250bpi.

This table shows how many tapes it would take to fill alternative capacities and how high that pile of 9 track tapes (at 1/2in each) would be.

The height could be up to twice the figures below if the tape container is included.

Examples:

1GB would take 5 tapes at 1/2in making the stack of tapes 2.5in high.

A 1TB disk would be the equivalent of 5,000 tapes forming a stack 208ft or 63.5m high!

9 Track Media Comparison					
	Size (B)	No of 9 track media	Metric height	Imperial height	Comment
Byte	1				One character
Kilobyte	10 ³				
Megabyte	10 ⁶				
1/2in tape drive	200 MB	1	12.7 mm	1/2 inch	~4 encyclopaedias
Gigabyte	10 ⁹	5	63.5 mm	2.5 inches	~10m of books on shelf
Terabyte	10 ¹²	5,000	63.5 m	208 feet	~1000 copies of the Encyclopaedia Britannica
Petabyte	10 ¹⁵	5,000,000	63.5 Km	39.5 miles	~20 million 4-door filing cabinets full of text
Exabyte	10 ¹⁸	5,000,000,000	63,500 Km	39,500 miles	5 Exabytes - all of the words ever spoken by mankind?
Zettabyte	10 ²¹	5,000,000,000,000	63,500,000 Km	39,500,000 miles	
Yottabyte	10 ²⁴	5,000,000,000,000,000	63,500,000,000 Km	39,500,000,000 miles	11 trillion years to download a Yottabyte ?
Brontobyte	10 ²⁷	5,000,000,000,000,000,000	63,500,000,000,000 Km	39,500,000,000,000 miles	
Geopbyte	10 ³⁰	5,000,000,000,000,000,000,000	63,500,000,000,000,000 Km	39,500,000,000,000,000 miles	Lost for words

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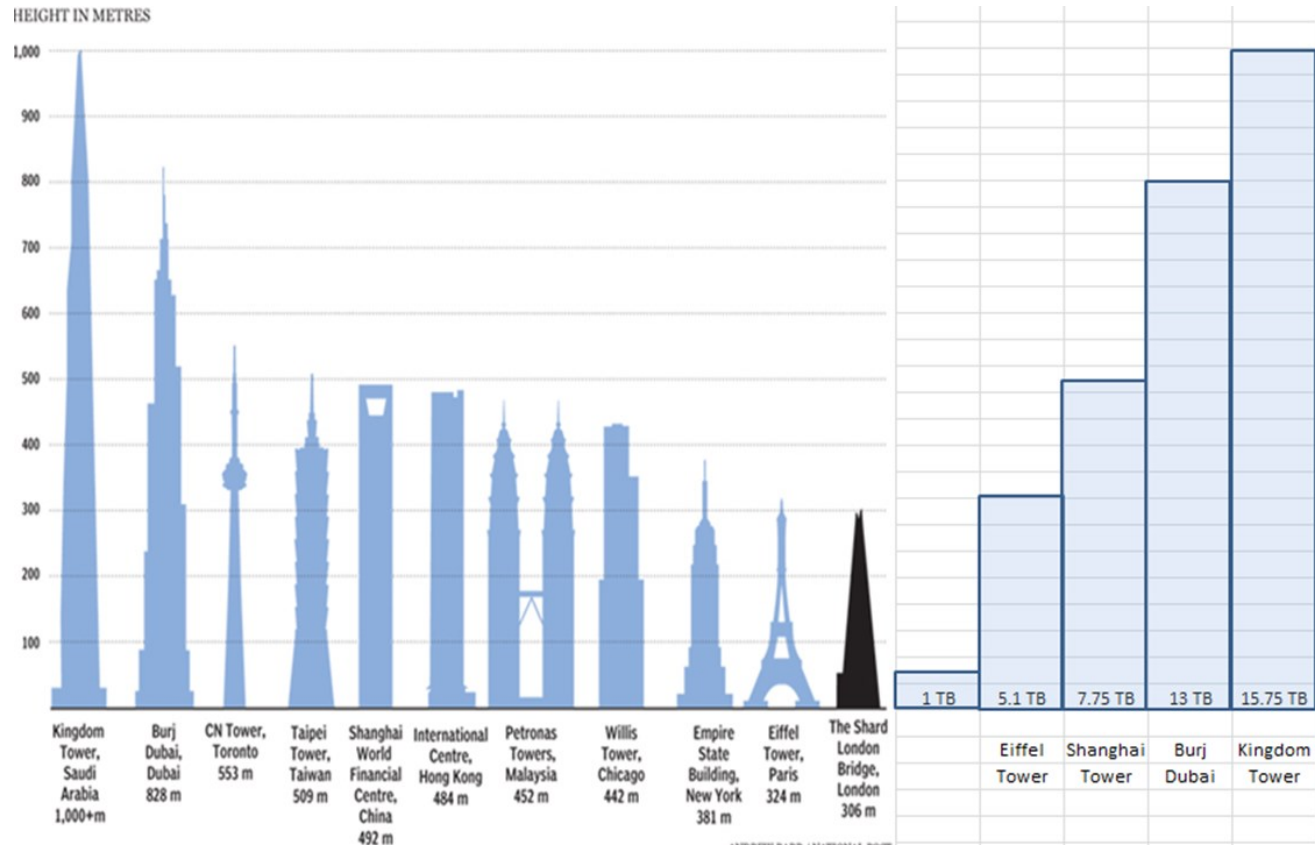
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