Preliminary

WESTPOINT

# I-5594/TapeFile

## High Capacity Tape Library System for S/390 and Open Systems

The I-5594/TapeFile half inch DLT cartridge library system offers the best combination of performance, capacity, scalability and price. Capacity ranges from 800 GB to 8 TB and bandwidth from 43 GB to an incredible 432 GB per hour native. The tape storage system is available as an Auto Loader, Random Access Library and a Virtual Tape Server. Enterprise wide connectivity is provided to IBM S/390, BS2000, Bull, UNISYS, UNIX and NT via ESCON, Block Multiplex Channel and SCSI.

### Best Value Package

Innovative engineering has made it possible to place the most requested features into the best value package. True incremental scalability provides low initial cost and investment protection when your needs grow. Optimal cartridge-to-drive ratio of 10:1 maintain high performance. Robust tri-axial robotics and built-in redundancy guarantees high reliability and a long life cycle. The tape system can be configured as Auto Loader with a sequential storage of 80 GB* per drive, as Random Acces Library and as Virtual Tape Server. Enterprise wide connectivity is provided to mainframes, UNIX and NT.

### Best Solution for S/390 Multiprise 3000

The low entry cost of less than $2 per GB qualifies the I-5594/TapeFile for UNIX and mainframe entry systems, such as the IBM S/390 Multiprise 3000, while the wide scalability protects the investment and provides growth when needed.

### Wide Range of Scalability

The basic building block of the modular I-5594/TapeFile library system is just 7 inch (4HU) high library module, available as table top or 19 inch rack mountable unit. It contains 20 DLT cartridges in two bulk-load magazines and one or two DLT tape drives. Supported are DLT 8000, DLT 7000 and DLT 4000 as well as the new Super DLT, when available.

But that's only the beginning. Additional modules, each only 7 inches high, can be stacked on top of each other to create a 10 module library system with 200 cartridges and up to 20 hot swappable drives. The intelligent modules configure into an extended library, where all cartridges can be loaded into all tape drives. The incremental scalability allows you to pay for the storage you need, when you need it, without loosing your initial investment in library hardware and software.

Assuming a data compression ratio of 2 : 1, the fully assembled library system can provide a total capacity of 16 TB and an almost incredible bandwidth of 240 MB per second or 864 GB per hour. All of this fits into a single 19 inch rack.

### Capacity / Performance Optimization

With 20 cartridges and 2 drives per library module the I-5594/TapeFile maintains the optimal cartridge - to - drive ratio of 10 : 1, no matter how much you may expand the library. In addition to the two bulk load cartridge magazines each module is equipped with a dedicated cartridge slot, which may be used as mailbox for importing and exporting single cartridges or as a cleaning slot, enabling automatic drive cleaning without loosing a data cartridge slot.

### Barcode

A Barcode scanner is available as an optional feature. Barcode support, normally only available in high cost library systems, all-

## Highlights

### Library Capacity

800 GB to 8 TB native
160 GB to 16 TB compressed
21 to 210 DLT Cartridges
1 to 20 DLT 8000, 7000, 4000 Drives

### Bandwidths

43 to 432 GB per hour native
86 to 864 GB per hour compressed

### Tape Drive Emulation

IBM 3490E
DLT 8000

### Backward Compatibility

36 Track with IBM 3490 Emulation
18 Track with IBM 3480 Emulation
9 Track with IBM 3422 Emulation

### Modes of Operation

10/20 Cartridge Auto Loader
Random Access Library
Virtual Tape Library with
- 18 GB to 1TB RAID Disk Cache
- 4 to 64 Virtual Tape Drives

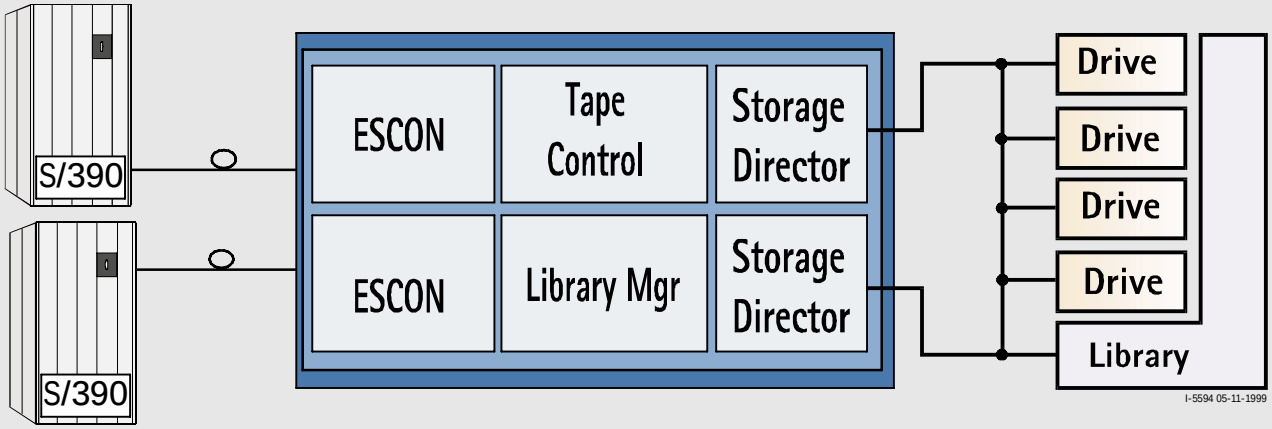
### Supported Host Systems

IBM OS/390, MVS, VM/VSE
IBM OS/400, AIX
Bull GCOS 8
Siemens BS2000
UNISYS, Tandem
UNIX, Windows NT

### Supported Interfaces

ESCON, Channel Type S
Block Multiplex Channel, OEMI
Channel Type 2
FIPS 60
SCSI, ETHERNET
ATM, FDDI

* DLT 8000 with 2:1 data compression




ows easy cartridge identification and fast cartridge inventory.

## Easy to Use and Easy to Maintain

All cartridges are located in a replaceable bulk load magazine, regardless of the size of the library. The 10 cartridge magazine allows fast import and export of cartridge sets enabling new handling patterns: Assigning particular magazines to different host systems or to different back up generations; separate magazines for input and output tapes; use one magazine for back up, the other for archiving or for storing temporary data sets; dedicate particular magazines to different logical or physical hosts; assign 1 magazine to S/390, the other to UNIX or NT; make a simultaneous copy of backup data for disaster recovery.

The I-5594/TapeFile is loaded with comprehensive diagnostic capabilities and provides Remote Maintenance via public or private networks or Internet. The robot servo system is self calibrating. It eliminates field adjustments and the need for special Field Service tools.

## DLT Tape Drive Technology

The I-5594/TapeFile uses Quantum's ½ inch Digital Linear Tape technology. Supported are DLT 4000, DLT 7000 and DLT 8000. Super DLT will be supported in the future. All drives are hot swappable. DLT 8000 provides a native storage capacity of 40 GB per cartridge and maintains a native data rate of 6 MB/s. The high efficiency Digital Lempel-Ziv (DLZ) compression/compaction feature can double or triple the cartridge capacity and data rate.

## IBM S/390 Connectivity

The I-5594/MagTape provides connectivity to Mainframes including S/390, BS2000, UNISYS, Tandem and Bull via ESCON or Block Multiplex Channel. It emulates IBM 3490 device characteristic and is supported by OS/390, VM/VSE and all other operating systems, which support 3490 type 36 track tape systems. The I-5594/MagTape library system comes in three different versions:

## Sequential Auto Loader:

One magazine with 10 cartridges is assigned to each tape drive. Cartridges are sequentially loaded, one after another, similar to IBM 3490 auto loader technique. A basic library module with 2 drives and two cartridge magazines and an assumed compression rate of 2 : 1 provides up to 1.6 TB sequential backup storage and a bandwidth of 86.4 GB/hour*. The basic library is field upgradable to 16* TB and to a bandwidth 864 GB/hour*.

## Random Access Library:

The I-5594 Library TapeFile control unit interprets the display messages or robot control commands from ADSM or other library programs, controlling random access to particular cartridges. Supported are all popular operating systems, including but not limited to OS/390, MVS, VM/VSE, BS2000, CGOS 8, as well as all major Tape Management Systems, including RMM, ZARA, CA1 and others.

## Virtual Library:

Virtual Tape offers immediate benefits to users by reducing personnel, hardware, media and environment expenses. Virtual Tape can provide faster data access, reduces tape mounts, and manages peak loads with reduced hardware by providing virtually an unlimited number of virtual tape drives. A high capacity DLT cartridge can hold up to 120 GB of compressed data. Most data volumes in the mainframe environment contain just 500 MB or less, wasting 90% or more of the available capacity. Virtual tape technology makes optimal use of tape resources and provides other more beneficial features, not available in any other system available today.

The I-5594/Virtual TapeFile utilizes the full cartridge capacity and significantly increases data throughput. It emulates 4, 8, 16, 32 or 64 virtual tape drives, no matter how many real physical tape drives are available in the library. The hosts volumes - no matter of its size - are temporarily stored on disk as virtual volumes and eventually stacked together with other virtual volumes on a real tape cartridge.
The virtually unlimited number of virtual drives compensate peak loads, deal with the ever increasing backup data in an ever shrinking backup window and ensures, that no program needs to wait for the availability of tape drives.

The I-5594 Virtual TapeFile can be equipped with RAID protected disk cache, ranging from 18 GB to 1 TB for parallel processing of up to 64 virtual drives and for keeping work files on disk cache for fast recall.

## True Enterprise Wide Storage Area Network

Because the I-5594/Virtual TapeFile is designed as Storage Area Network (SAN), it provides enterprise wide access from mainframes, UNIX and NT systems. Mainframes connect via ESCON or Block Multiplex

Channel, while open systems connect via LAN or WAN (Ethernet, ATM, FDDI). This architecture maintains enterprise wide, centralized data management for tape- and backup resources and enables the establishment of an enterprise wide backup- and data security strategy.

## Remote Tape Processing

The SAN architecture provides connectivity to remote hosts some thousand miles away via public or private networks. This feature provides new capabilities in the enterprise wide storage management of locally dispersed systems and in developing new strategies for disaster recovery.

## Backward Compatibility to 36, 18 and 9 Track Tape Format

There are still millions of 9 track open reel tapes in the archives and 9 track tapes are still used for data exchange. IBM terminated manufacture of 9 track tape systems 20 years ago. The existing field units are worn out, short of spare parts, expensive to maintain, consume costly floor space and power and do not support ESCON and SCSI. The same is principally true for 18 and 36 track tape cartridge systems.

One size fits all. In addition to DLT, the I-5594/MagFile provides full backward compatibility between 9; 18 and 36 track tape systems by emulating IBM 3422, 3480 and 3490 device characteristics. It provides ESCON and SCSI connectivity to old tape technologies and pays for itself with reduced maintenance costs and savings in floor space, power consumption and increased availability.

## Open Systems Connectivity

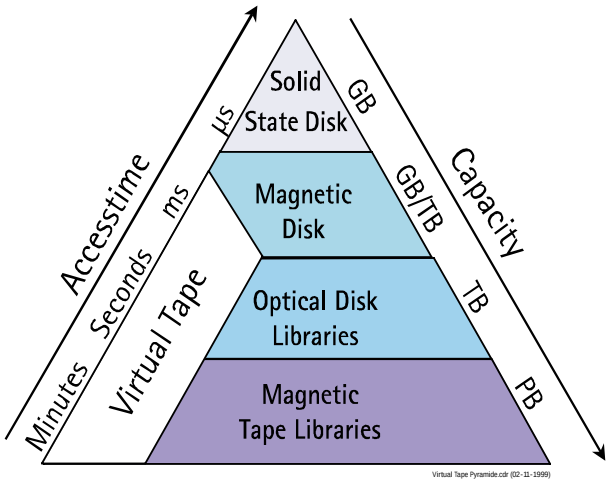
The I-5594/MagTape provides connectivity to UNIX and Windows NT via SCSI, Ethernet, ATM, FDDI and other links. Fibre Channel connectivity is under development. Mainframe and Open Systems connectivity can coexist to provide a true enterprise Tape Storage Area Network.

## Reliability and Availability

The I-5594/MagTape is designed for reliability and availability. The Remote Service Facility via public network and Internet is a standard feature, enabling remote diagnostics and statistical error analysis. It allows the replacement of weak components before the user recognizes malfunctions. Tape drives are hot swappable and the modular design of the tape library allows to continue operation even if one library module is defective. A Twin control unit is available as optional feature provides fault tolerance. If one twin fails, the other still provides full access to the library.

## Ready for the Future

With all these features the I-5594/TapeFile is the most advanced tape system available today. It enables sophisticated use of today's tape technologies, provides full backward compatibility to older tape formats and protects the investment in the future: Intercom guarantees the implementation of future tape technologies as is becomes available. There will not be any need to replace the whole tape system anymore to participate in new tape technologies.



# Specifications

| I-5594 Control Unit | Single | Twin |
|---|---|---|
| Total Number of Channels | 4 | 8 |
| Total Number of Storage Directors | 4 | 8 |
| Number of supported Tape Drives | 16 | 16 |
| Compatibility | IBM 3490E | |
| Modes of Operation | 10/20 Cartridge Sequential Auto Loader<br>Random Access Tape Library<br>Virtual Tape Library | |
| Virtual Tape Library Disk Cache | 18 GB to 1000 GB | |
| Virtual Tape Drive Support | 4, 8, 16, 32 or 64 virtual Tape Drives | |
| Backward Compatibility | 36 Track Cartridge Drive, IBM 3490 compatible<br>18 Track Cartridge Drive, IBM 3480 compatible<br>9 Track Open Reel, IBM 3422 compatible | |
| Supported Operating Systems | IBM OS/390, MVS, VM/VSE<br>IBM OS/400, AIX<br>Siemens BS2000, Bull GCOS 8<br>UNISYS, Tandem<br>UNIX, Windows NT | |
| Interfaces | ESCON, Channel Type S<br>Block Multiplex Channel, OEMI<br>FIPS 60, Channel Type 2<br>SCSI, Ethernet, ATM, FDDI, HIPPI | |
| Remote Maintenance | Via Public Network or Internet | |

| MagFile Library | Basic | Max |
|---|---|---|
| Number of Library Modules | 1 | 10 |
| Number of DLT Drives | 1 or 2 | 10 to 20 |
| Number of DLT Cartridges | 21 | 210 |
| Number of removable Magazines | 2 | 20 |
| Number cartridges per Magazine | 10 | |
| Number of dedicated Cartridge Slots | 1 | 10 |
| Cartridge Capacity native/compressed* | 40/80 GB | 40/80 GB |
| Library Capacity native/compressed* | 0.8/1.6TB | 8/16 TB |
| Bandwidth native/compressed* | 6/12 MB/s | 120/240 MB/s |
| Power | 220/110 V, 50/60 Hz, 5 Kw max. | |

* DLT 8000

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