

Philips NCTP Tape, Library, And
Optical Roadmaps
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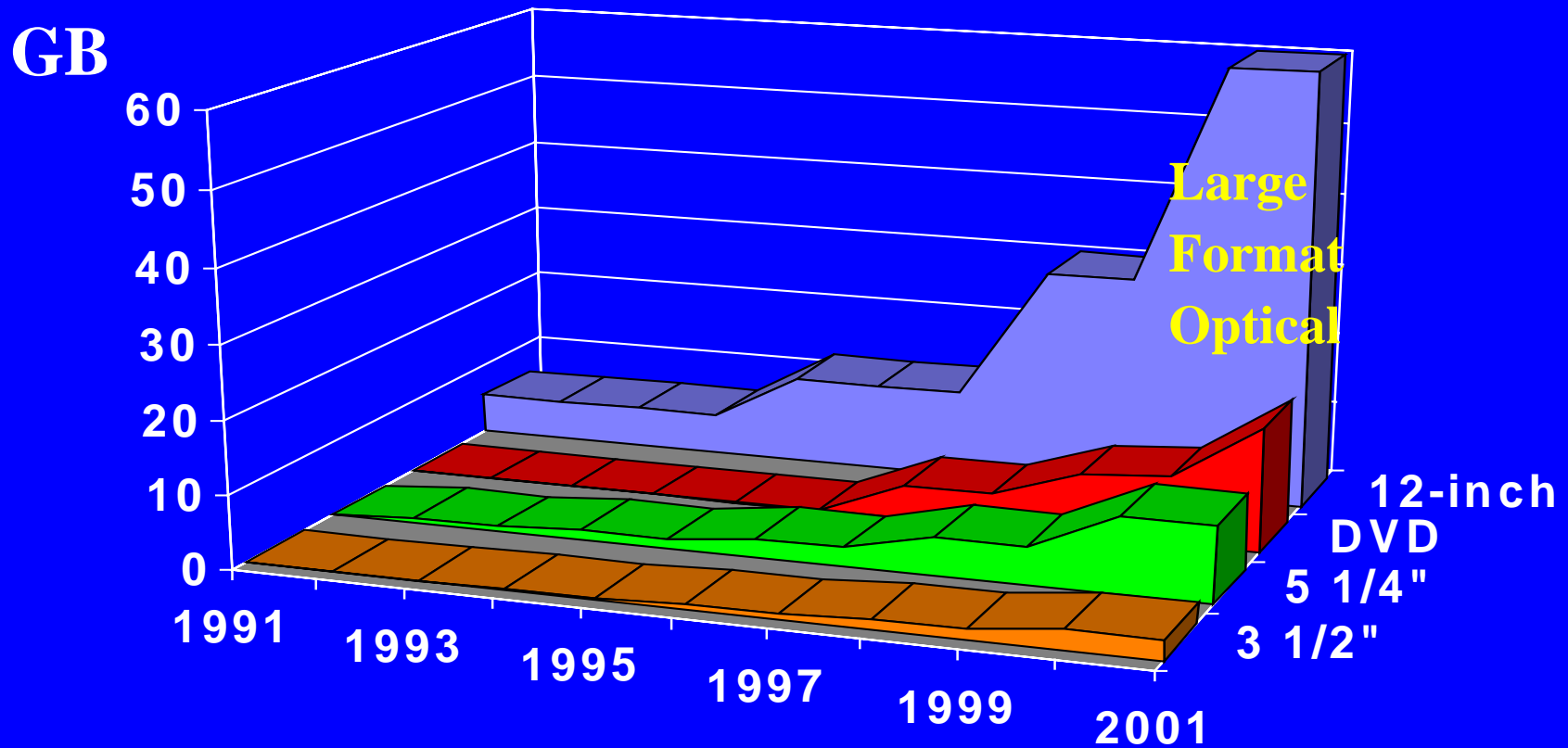
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Digital Tsunami of Data

- ◆ Storage demand maintains 100% increase as digitally replace: movie, phone, TV
- ◆ 95% non ASCII images still paper, film, and fiche more expensive than electronic
- ◆ Demand/growth will not slow for 12 years
- ◆ 2005 - 100X greater storage requirement
- ◆ 2009 - 1000X greater storage requirement

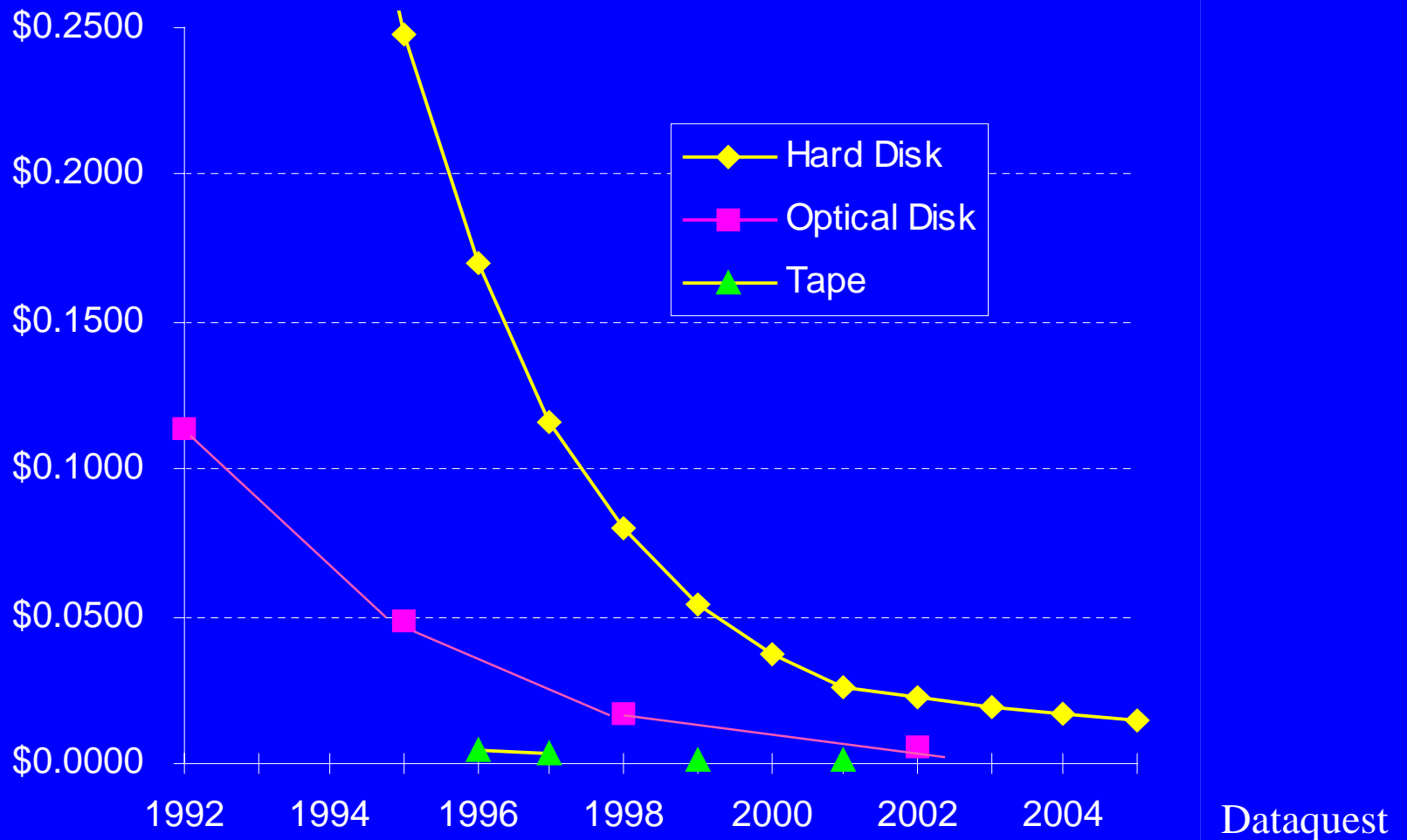
Where Is Optical Going?



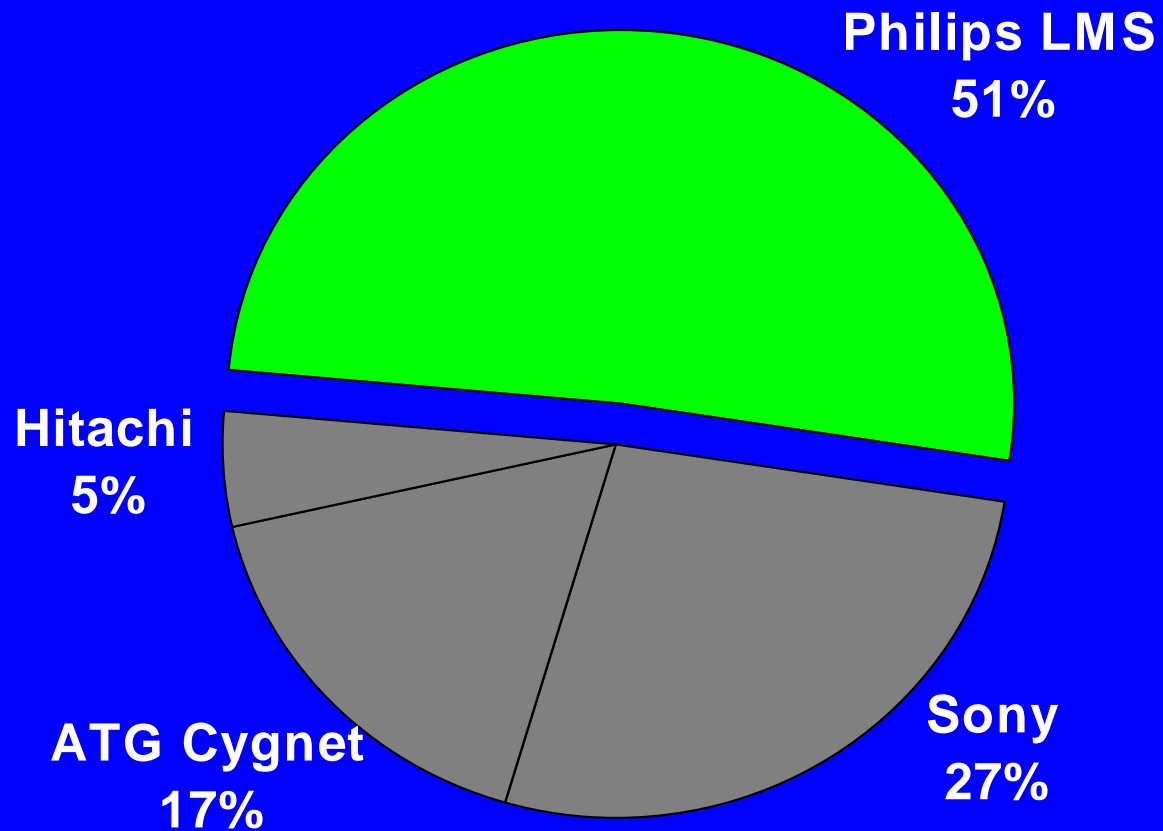
Source: Dataquest



End User \$ per MB Storage



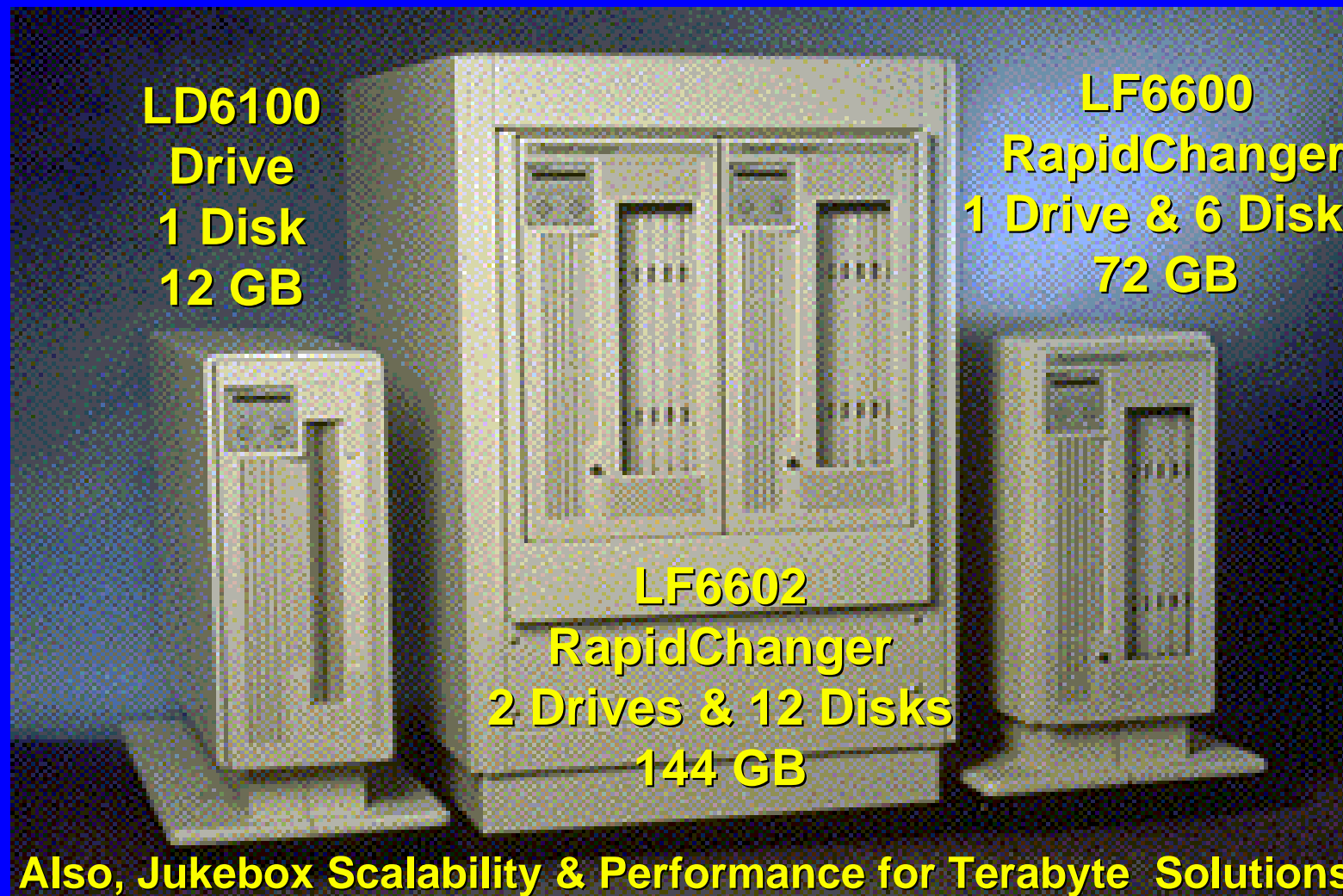
Large Format World Market Share



Source: Dataquest April 97 Preliminary



Philips *Infinity* 6000 12-Inch Family



LD6100
Drive
1 Disk
12 GB

LF6600
RapidChanger
1 Drive & 6 Disks
72 GB

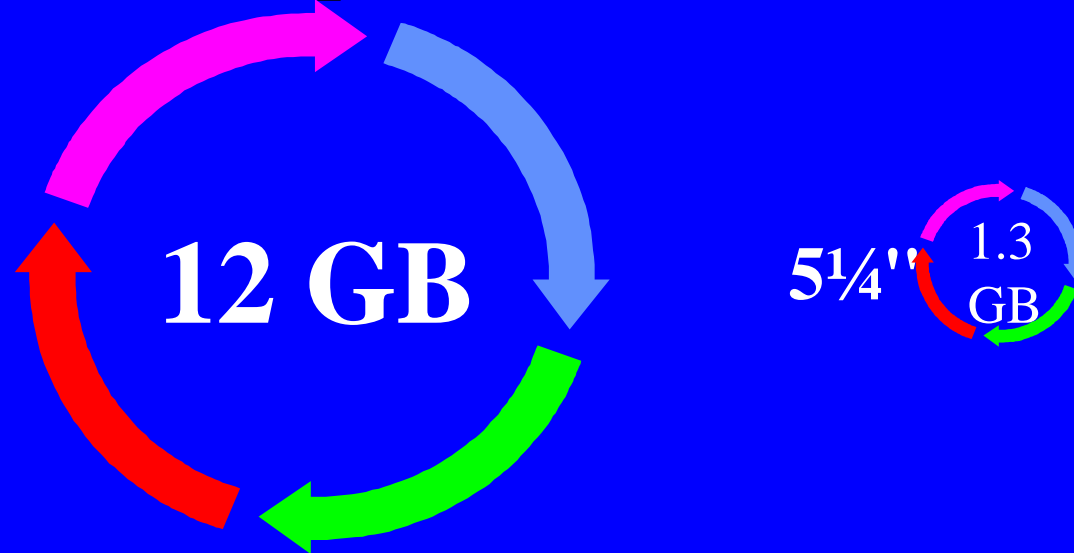
LF6602
RapidChanger
2 Drives & 12 Disks
144 GB

**Also, Jukebox Scalability & Performance for Terabyte Solutions
(264 GB to 1.74 TB)**



Factors Affecting Performance

- ◆ More data under head is better on-line access
- ◆ Swap time is 95% of total access
- ◆ **More data on media and dual-head means fewer swaps & no flips**



Doculabs Independent Testing “Ideal Deployment”

Best Use 5¼” HP

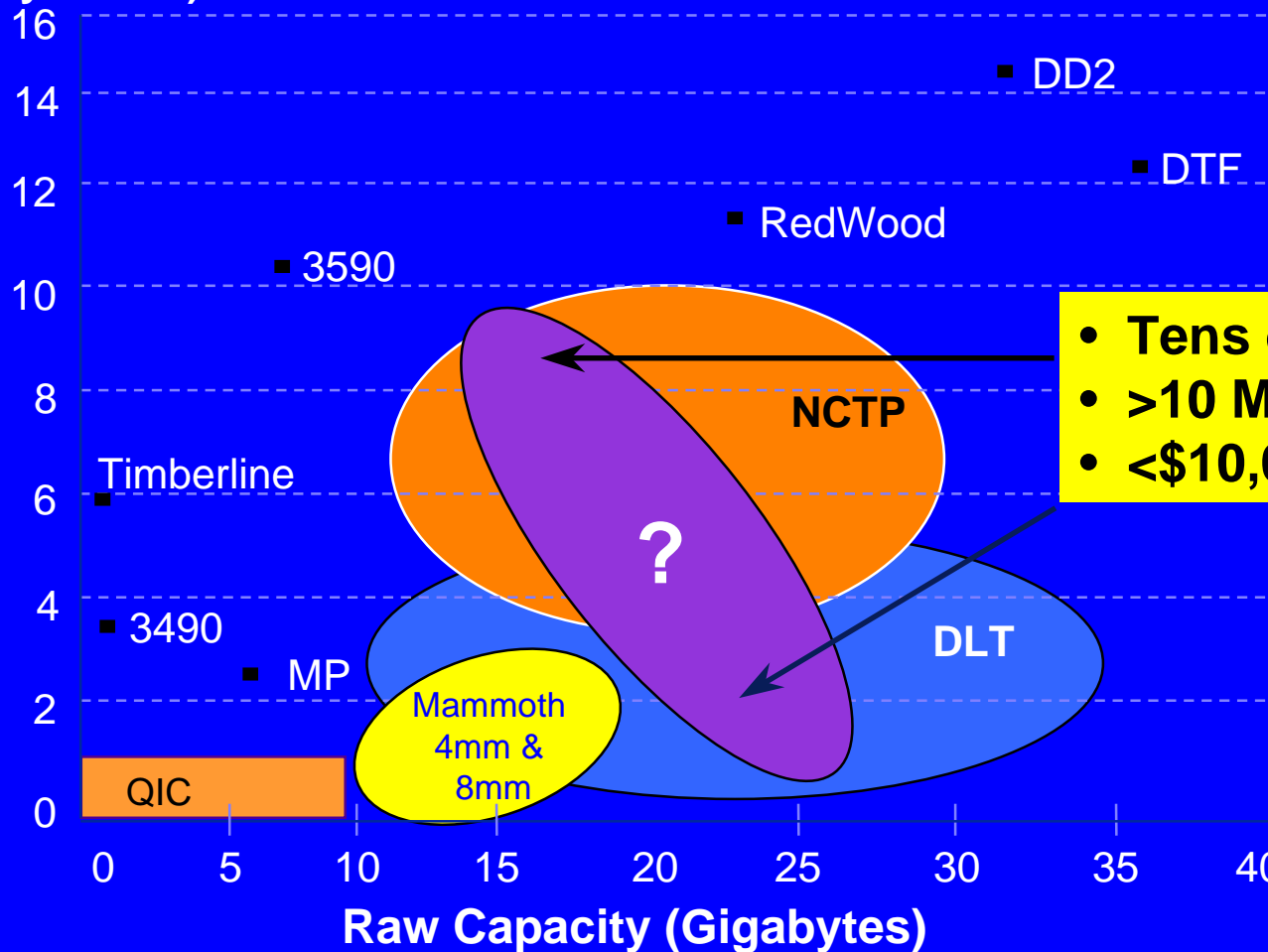
- Low volume and access
- Cost is overriding factor
- Rewritable media is required

Best Use 12-inch RapidChanger

- High retrieval and fast access
- Frequent multitasking requests
- Large capacity growth path

Optimum Tape User Requirements

Transfer Rate
(Mbytes/sec)



- Tens of GBytes
- >10 Mbytes/sec
- <\$10,000

Source: Gartner Group '96



Tape Capacity-With-Performance for Fast Backup and Restore



NCTP Specifications

- ◆ 20 GB native capacity
- ◆ 10 MB/S native sustained
- ◆ Reads 3480/3490E
- ◆ SCSI-2 F/W
- ◆ Load time <30 sec.

Automation Support

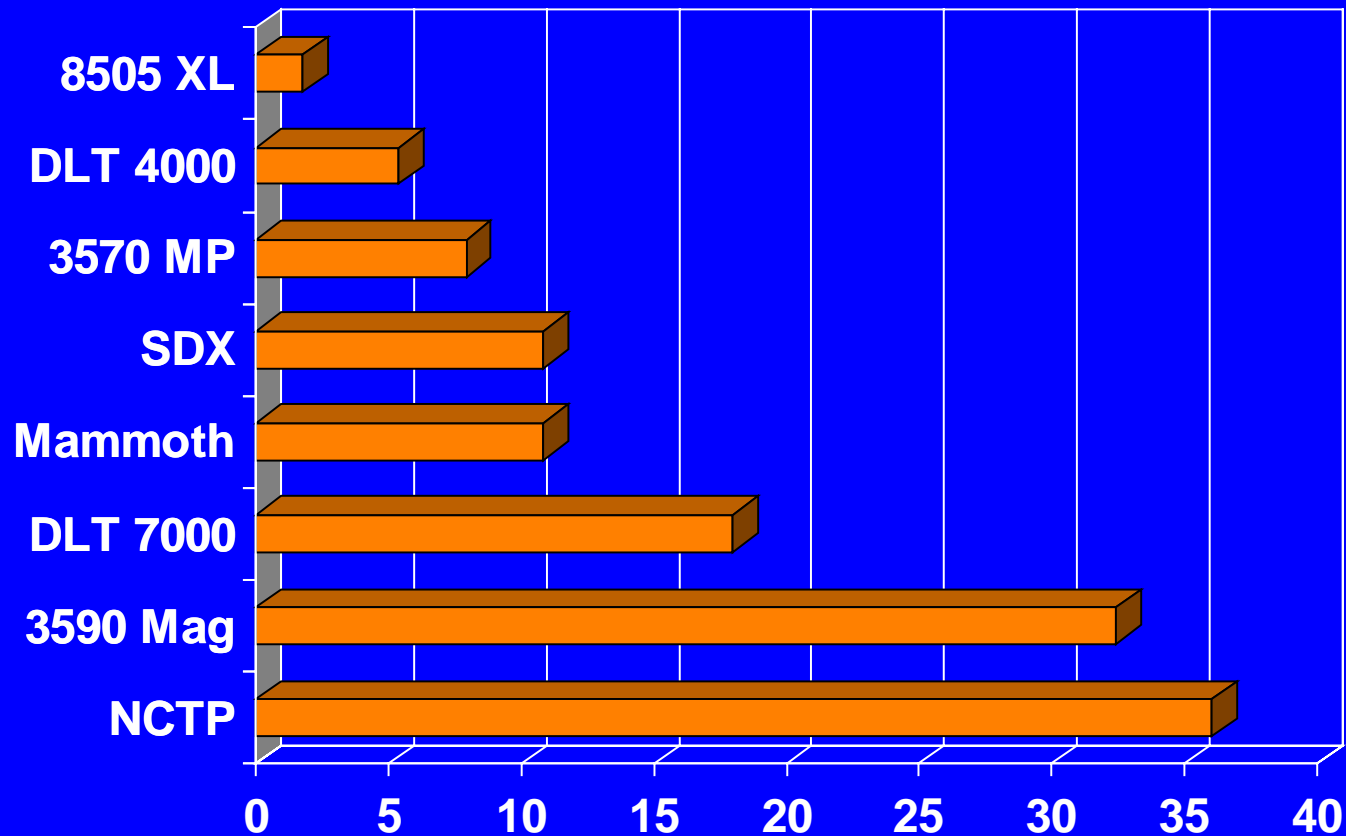
◆ Autoloaders 140 GB - 280 GB

- ◆ 7 cartridge autoloader
- ◆ 14 cartridge autoloader

◆ Libraries

- ◆ BlackJack 21 cartridge to 735 GB
- ◆ EMASS, ATL, & others to 40TB+

Data Transfer GB/Hour



NCTP Storage Applications

Horizontal

- ◆ Open Systems Backup/Restore/Archive
- ◆ High Performance HSM
- ◆ 18 & 36 Track Interchange

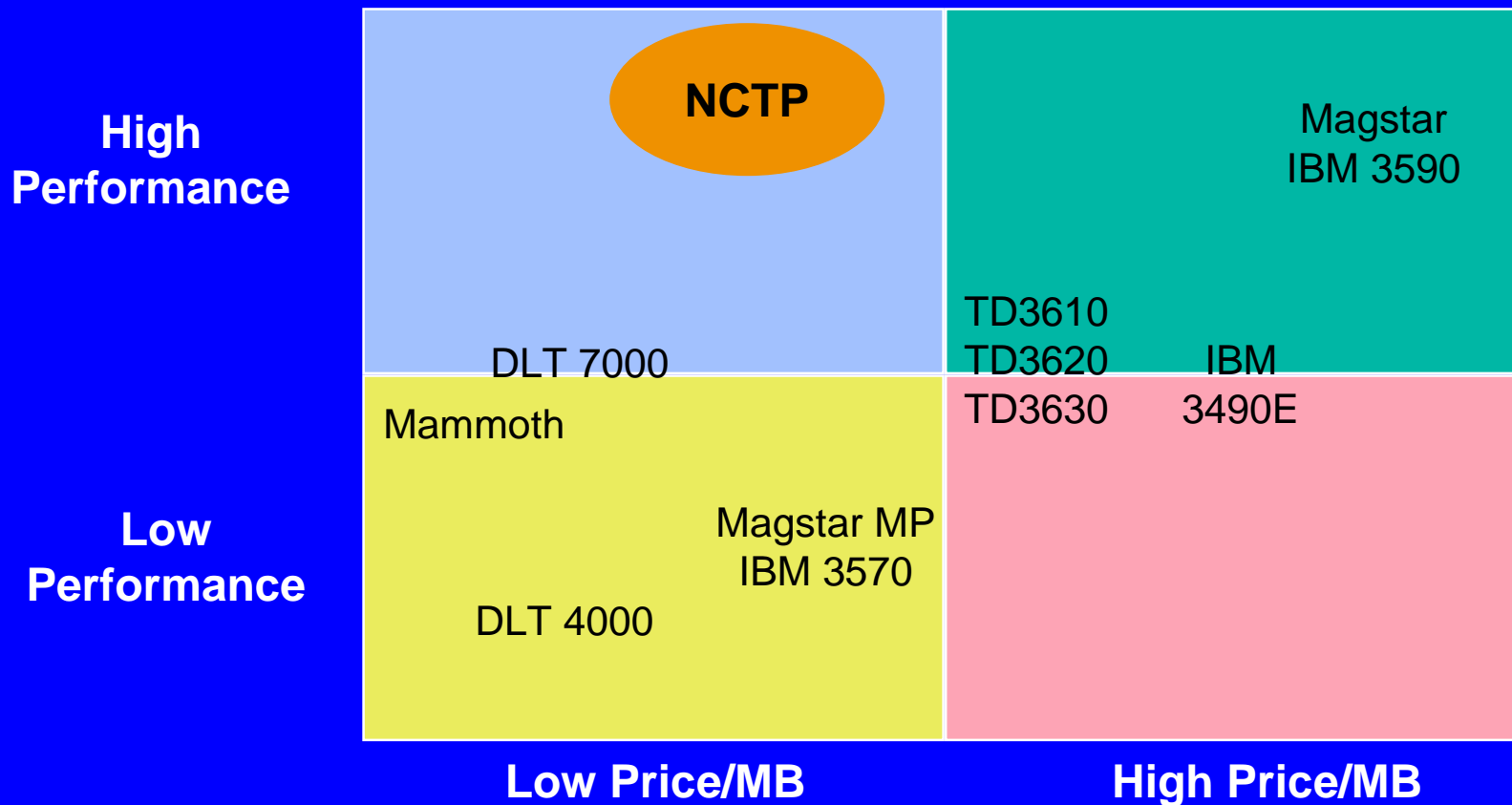
Vertical

- ◆ AS/400
- ◆ Oil/Seismic/Geophysical
- ◆ Imaging: Video Broadcast, Medical, Check
- ◆ Data Warehousing

Application Software

- ◆ Legato — Networker
- ◆ Platinum Technologies/ASC — NetArchive
- ◆ EMASS — AMASS
- ◆ NovaStor — NovaBack
- ◆ Cheyenne — ARCserve, JETserve
- ◆ OpenVision — AXXiON
- ◆ SCH Technologies — REELbackup/REELlibrarian
- ◆ Seagate Software — Backup Director
- ◆ Future ADSM enhancements, RS/6000 & AS/400

NCTP Performance/Price/MB



NCTP's cost-conscious performance outruns competing tape technologies



BLACKJACK 21



*Reinventing The Rules
of Tape Automation*



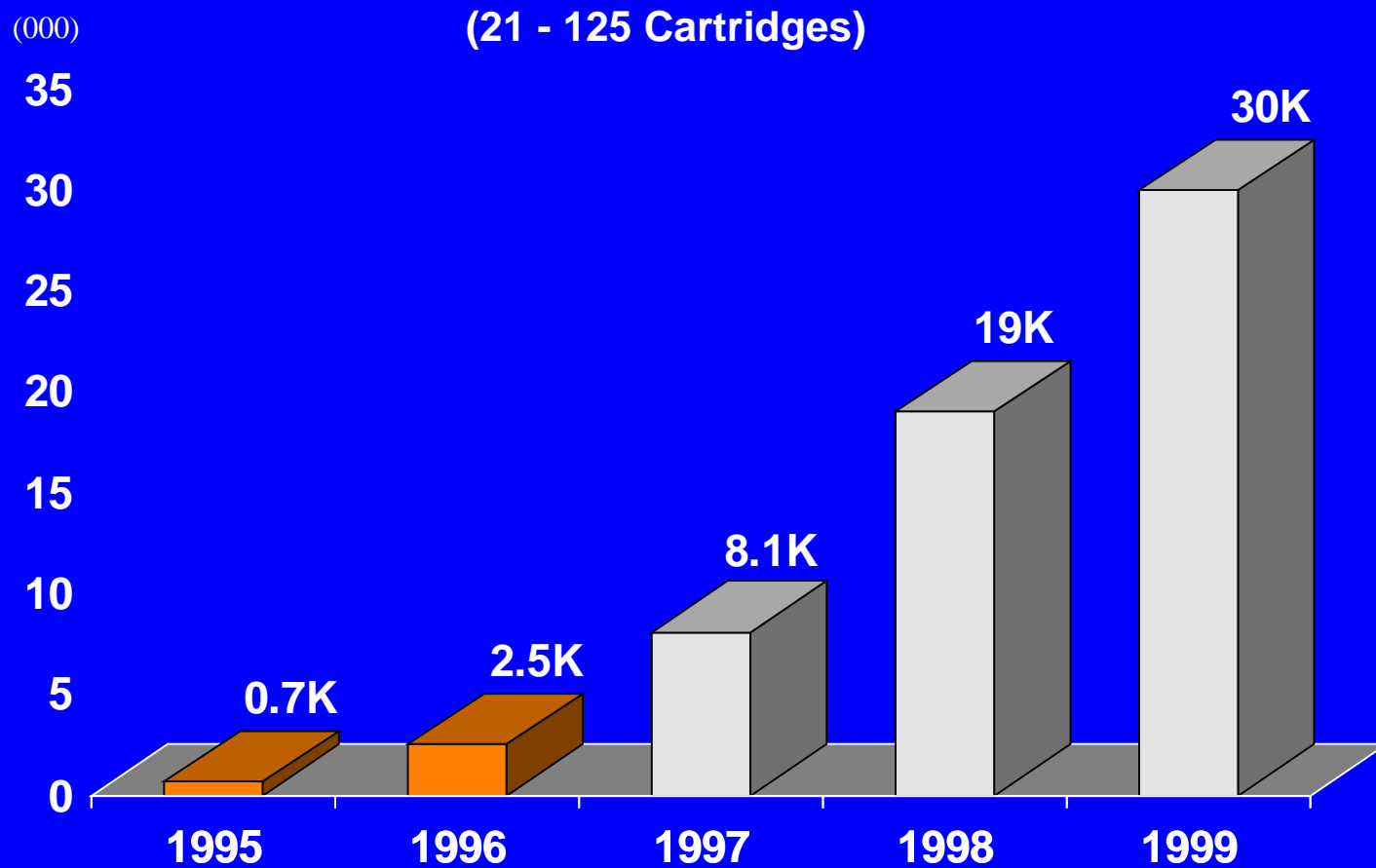
Mainframe Class Automation

- ◆ 21 + 1 cartridges in 3 removable magazines
- ◆ SCSI-2 F/W - EXB440/480 emulation
- ◆ Standard Barcode
- ◆ Express Cartridge Access Port
- ◆ 300 exchanges/hour

Reliability

- ◆ MCBF - 1,000,000 cycles
- ◆ MTBF - 60,000 hours
- ◆ MTTR - 25 minutes
- ◆ Warranty - 2 years
- ◆ Supports manual mode of operation
- ◆ Extensive diagnostics
- ◆ ISO 9001* and 9002

Mid-Range Library Market Unit Forecast



Source: Dataquest & Philips LMS



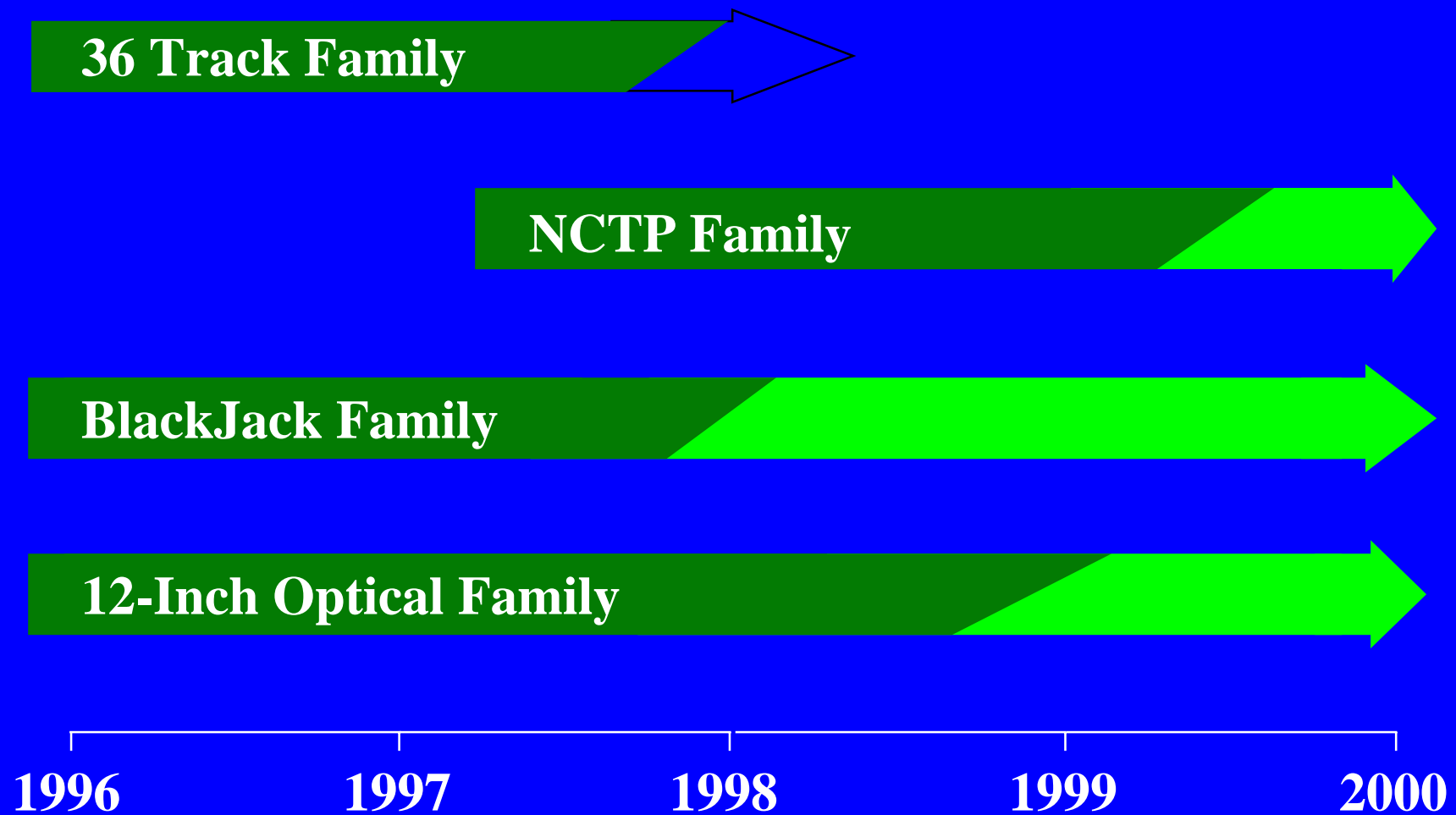
BlackJack21 Software Support

- ◆ Legato - Networker
- ◆ Cheyenne - ARCServe
- ◆ Seagate/Palindrome - Backup Director, (ARCADA), Backup Exec
- ◆ IBM - ADSM
- ◆ SCH - REELibrarian
- ◆ Spectralogic Alexandria
- ◆ OpenVision - AXXiON
- ◆ EMASS - AMASS

Philips LMS Commitment To Mass Storage

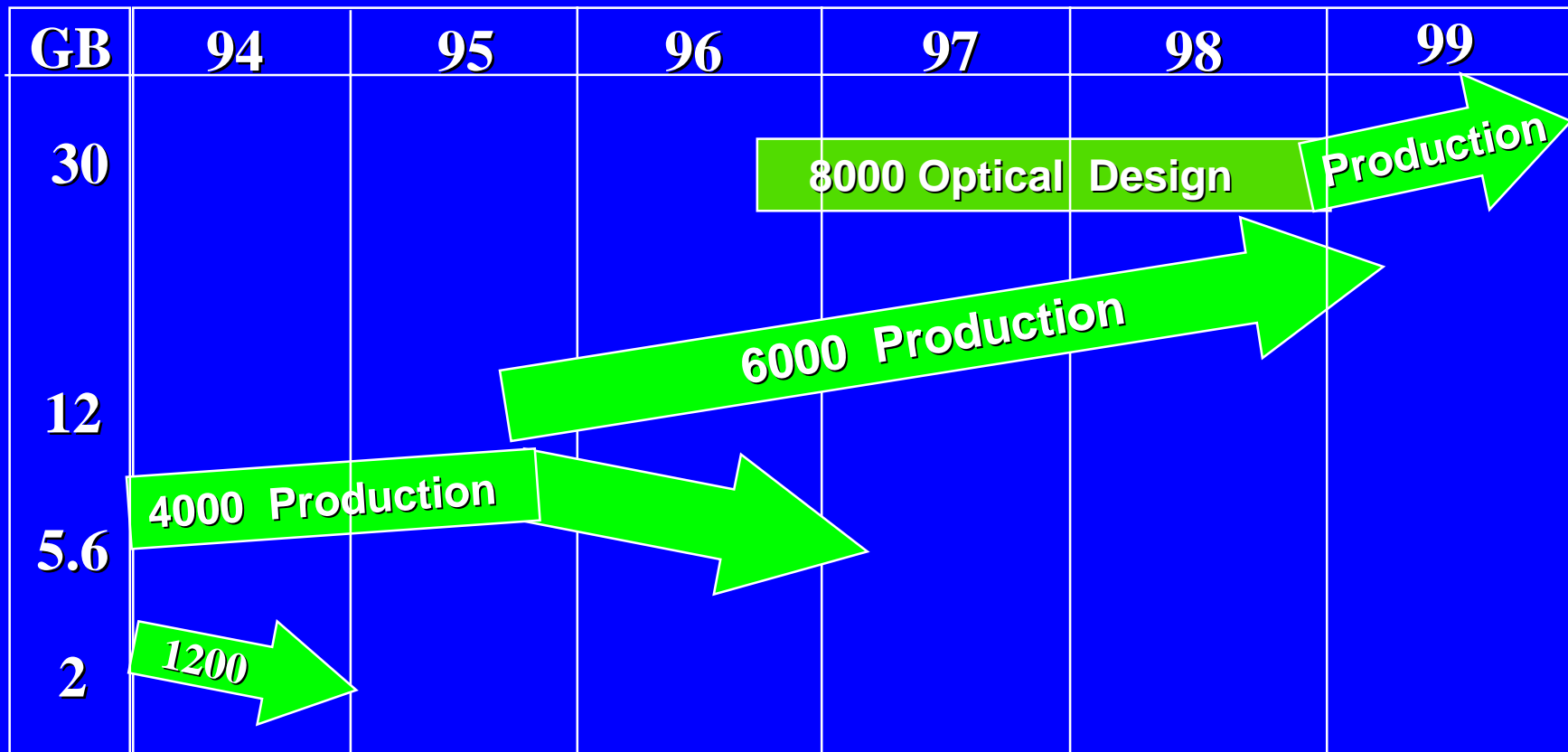
Roadmaps of Products

Philips LMS Product Roadmap



Philips 12-Inch Optical Roadmap

Leader 12-Inch Performance, Capacity & Cost/MB



12-Inch Optical Product Evolution

	4000	6000	8000	10000
Capacity (GB)	5.6	12	30	60
Transfer Rate (read MB/sec)	0.7	2.7	6.7	10
Avg. Seek Time (msec)	100	65	50	<50
Recording Layer	Ablative	Ablative	Phase Change	Phase change
Laser Wavelength (nm)	830	780 (IR)	640 (red)	480 (blue)



NCTP Roadmap

	NCTP	NCTP2	NCTP3
Capacity	20 GB	40 GB	80 GB
Transfer	10 MB/s	20 MB/s	30 MB/s
Reads	3480 & 90 NCTP	3480 & 90 NCTP1/2	3480 & 90 NCTP1/2/3
Chip in Cartridge	No	Yes	Yes



BLACKJACK-II Roadmap

- ◆ 84 cartridges
- ◆ 10 DLT or 6 NCTP drives
- ◆ Ultra-SCSI and Fibre Channel Interface
- ◆ Product launch '99

Philips LMS Design Competence

- ◆ Same Seasoned Product Engineering Teams
- ◆ Use existing building blocks
- ◆ Improvements each cycle
- ◆ Leverage Philips multi billion dollar investment in tape and optical technology

Gartner '97 Insights

- ◆ Storage is central, no longer peripheral
 - ◆ Virtual Tape Subsystem manages tape not host
- ◆ Data warehousing & internet same storage
- ◆ Mainframe is not dead
- ◆ NT long time to get going
- ◆ Total solutions, bundle S/W, consolidations
- ◆ Fibre & SSA merger freeze market 18 mos
- ◆ Users look at total cost of ownership

Thank You For Your Time!
Any Questions?

Sam Green

Philips LMS

www.philipslms.com

