

READY F



DM511774

REWIND

ERASE



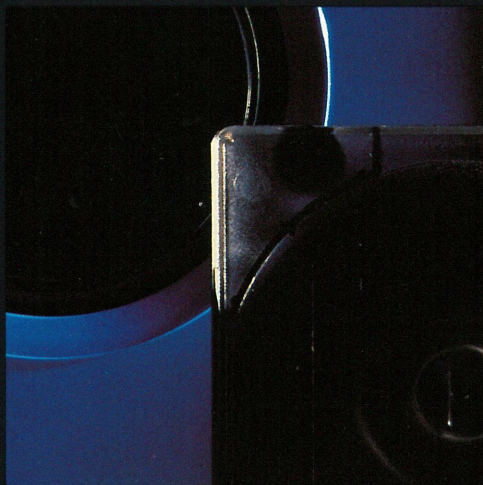
EOT

LOCATE

MY862674

READY U







**READY F**

Selected

Rewind Unload Ready

Not Ready

DM511774

Rewind Unload Ready

Not Ready

**REWIND**

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**ERASE**

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EOT

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**LOCATE**

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MV862674

Selected

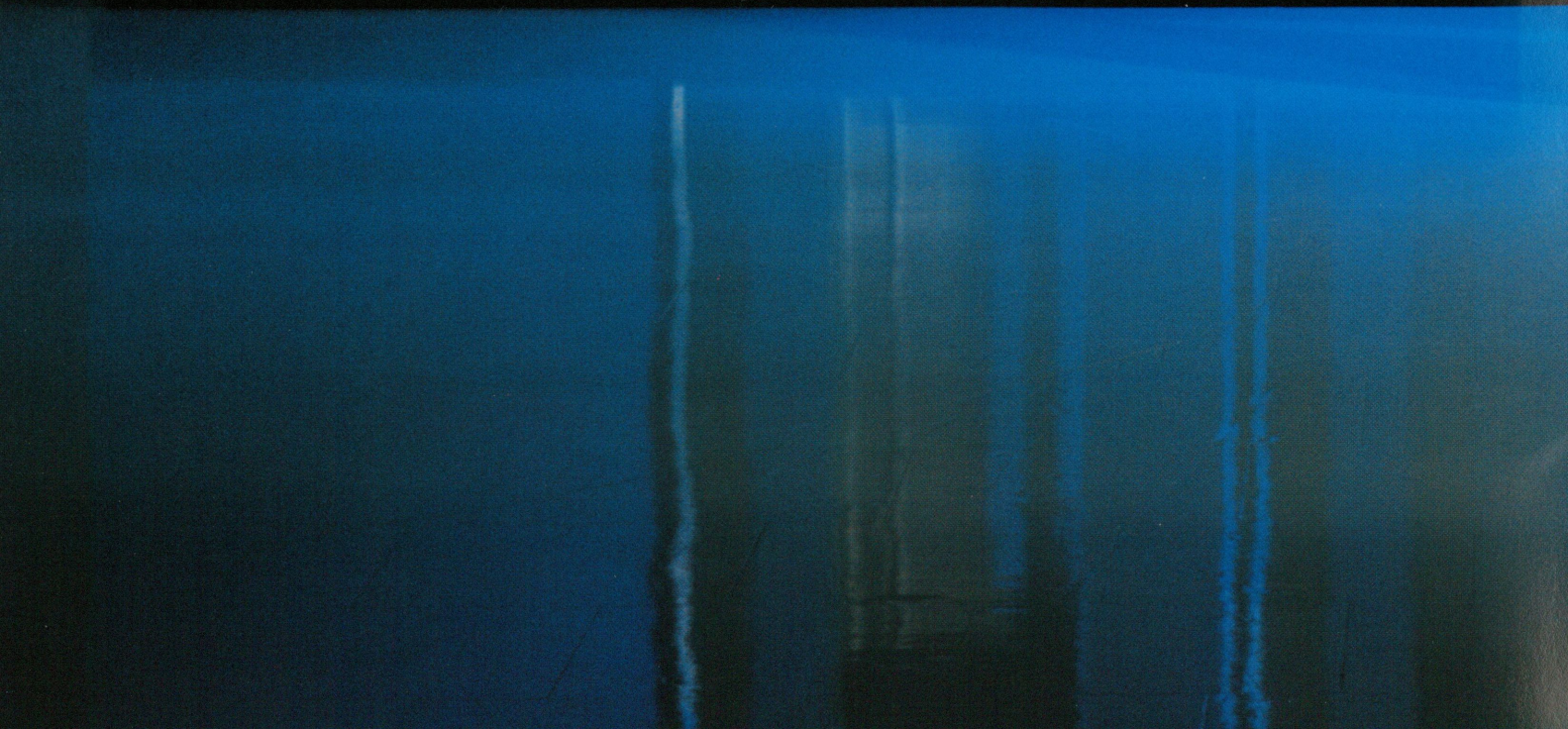
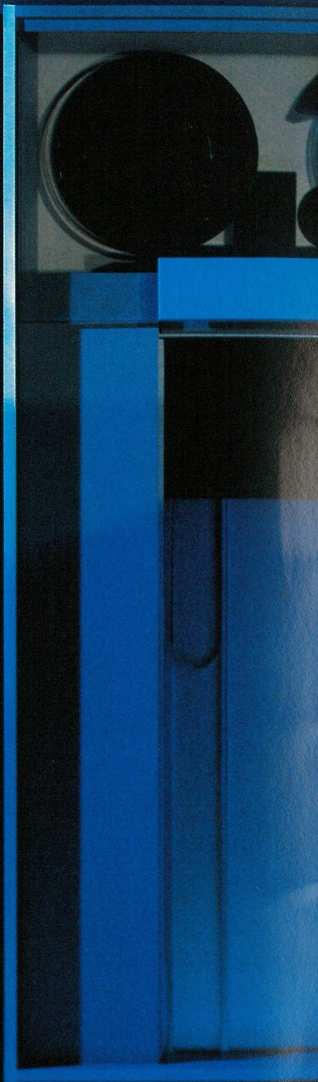
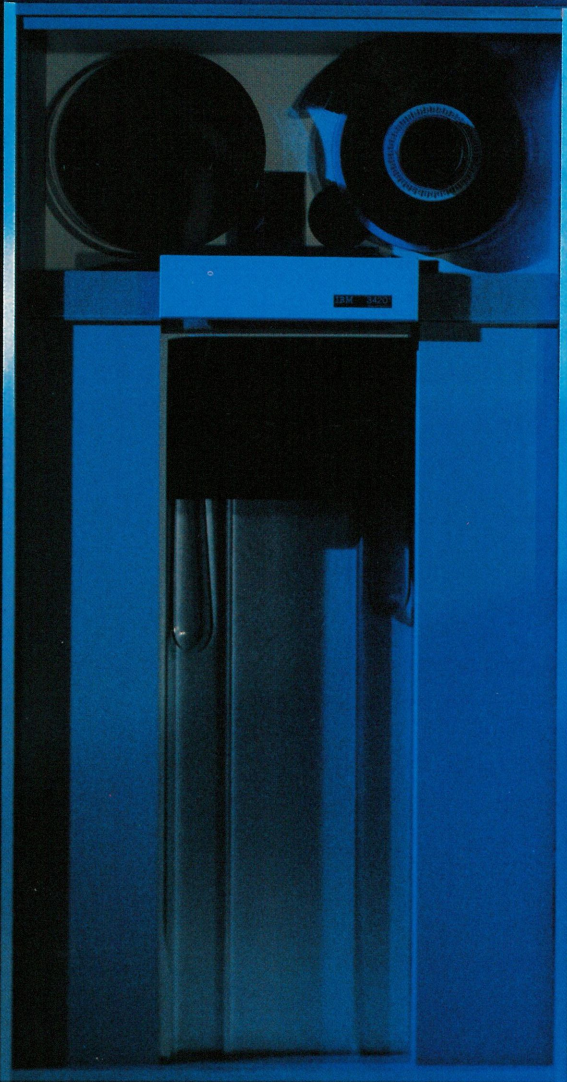
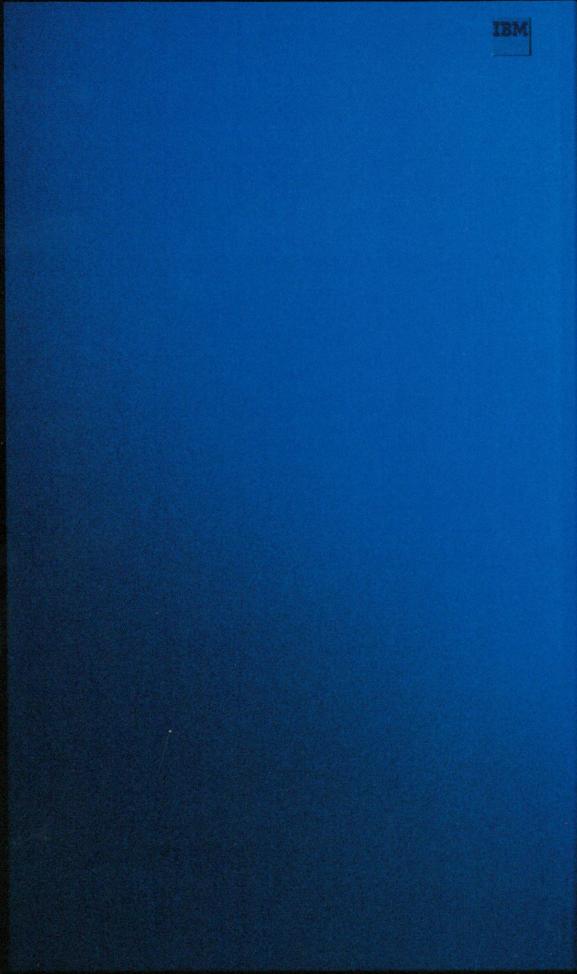
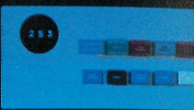
Rewind Unload Ready

Not Ready

**READY U**

Rewind Unload









**The IBM 3480 Magnetic Tape Subsystem:  
a combination of advanced technologies  
to improve data reliability,  
save space and energy,  
reduce costs,  
and bring tape processing up to speed**



## **Under the compact covers, some remarkable breakthroughs**

The IBM 3480 Magnetic Tape Subsystem can help you do your tape jobs better, with improved performance and reliability, less maintenance, and lower operating costs.



### **Consider these new features:**

A thin film read/write head, combined with chromium dioxide tape, delivers a data density of more than six times the current 6,250 BPI standard. The tape is packaged in an enclosed, easy-to-handle cartridge, about one-fourth the size of a standard tape reel.

A dynamic buffer, located in the control unit, provides asynchronous and concurrent operations and increases performance to balance today's high-speed channels and direct-access storage devices.

Microprocessors in both the control unit and the tape drive are used to improve and enhance tape functions.

The 3480 requires less than half the space, power, and cooling needed for the 3420-8. Compact cartridges need less library space. There's even a cleaning cartridge to improve operator productivity.

### **From new technology, increased reliability and performance**

Laboratory tests comparing 3420-8 and 3480 read reliability show 3480 improvements that reduce tape-related reruns and increase operational productivity. And the 3480 can operate at data rates as high as three megabytes per second (more than twice that of the 3420-8), thus keeping pace with today's processors and preparing for those of tomorrow.



## **Subsystem components**

The 3480 Model A22 control unit incorporates a 512K-byte buffer which dynamically manages the flow of data between the channels and tape drives. Data in the buffer can be transferred into or out of the channel at the same time that other data is being transferred either to or from any drive. Similarly, before the control unit completes the transfer of data to or from a drive, it can start a second drive in motion. As it completes the first operation, the control unit can begin reading from (or writing to) the second drive with minimum delay. (The dual control unit configuration option provides increased availability and improved performance. Work loads are balanced between the two buffers by drive allocation algorithms in the control unit microcode.)

Up to four channels can be attached to each control unit (for a maximum of eight, if the dual control unit feature is installed), and control units may be located as far as 400 feet from the processor.

A built-in microprocessor in the control unit initiates error recovery actions and runs subsystem diagnostics independent of channel operations.

The 3480 Model B22 tape unit has two tape transports, each with its own microprocessor, making possible several new tape functions. For example:

... an eight-character message display can identify which cartridge the operator should mount or dismount, and it can indicate the operational status of each drive and display an error code in the event of an equipment failure.

... the "high-speed search" function allows the drive to move tape at twice the normal speed to locate the desired block of data. Because the drive is disconnected from the control unit during much of the search, other control unit processing can overlap the search function.

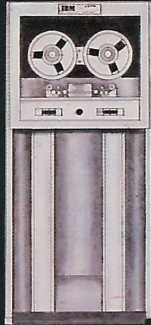
The microprocessor also electronically controls the tape motion, eliminating the need for vacuum columns, capstan motors, and reflective markers.

With its totally new design, inside and out, the 3480 offers much improved performance. These media and subsystem advancements form the basis for IBM's future direction in magnetic tape development.

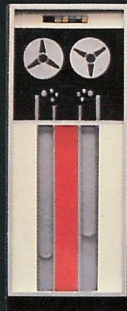




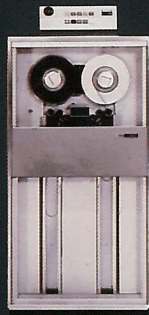
1952: 726



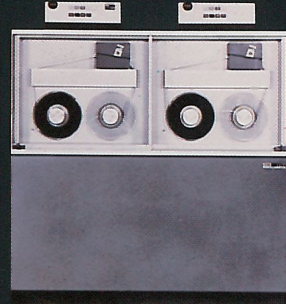
1953: 727



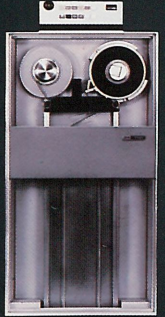
1957: 729



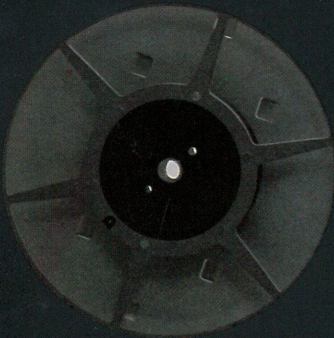
1964: 2401



1965: 2415



1968: 2420



1953: 726 Reel

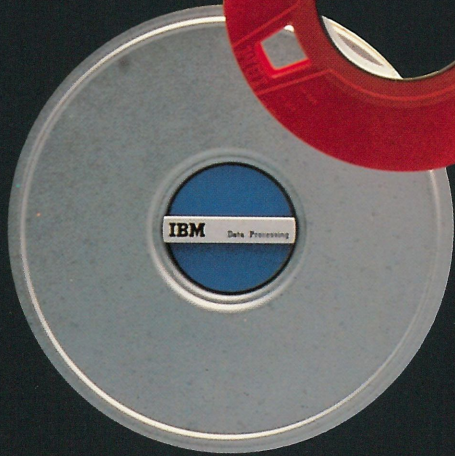


1960: 729 Reel

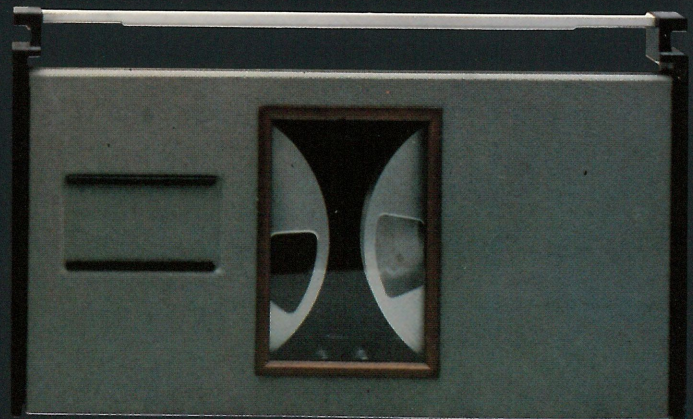


1962: 6" Reel (for mailing)

1954:  
727 2400' Reel



1960: 10 1/2" Reel Canister



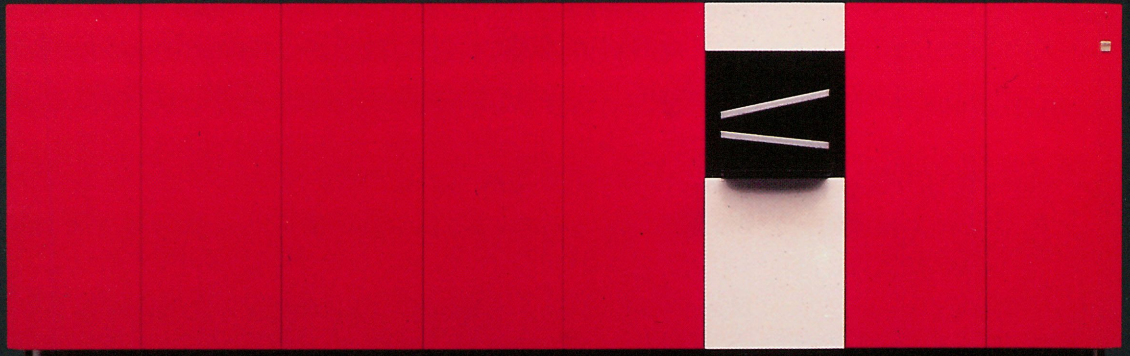
1962: 7340 Hypertape Cartridge



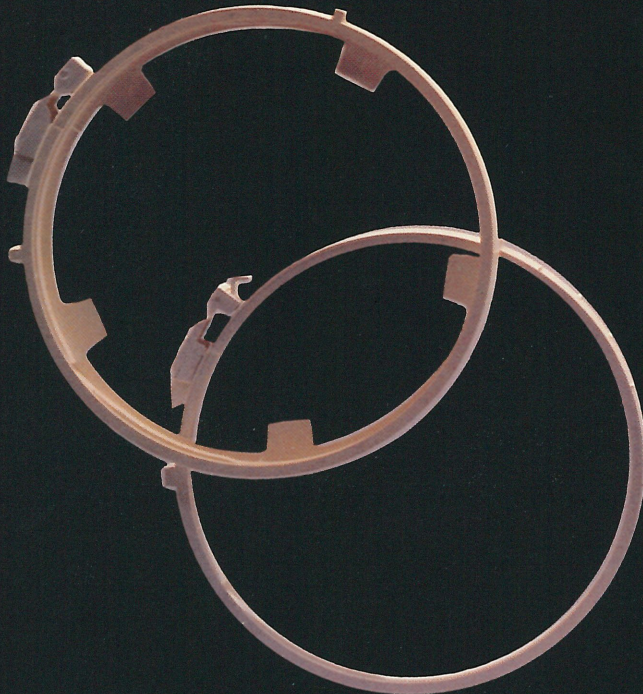
1971: 3410



1974: 3850 Mass Storage Subsystem (MSS)

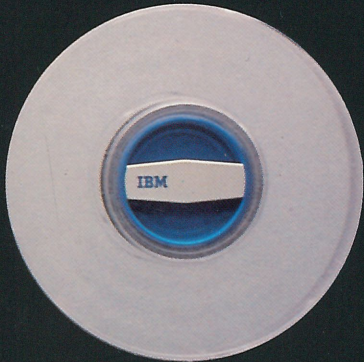


1968: 2420 Cartridge



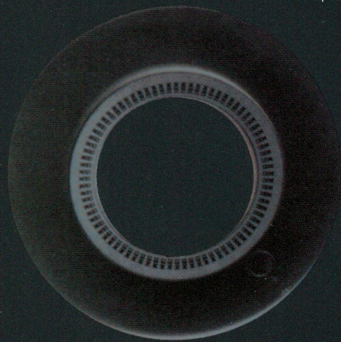
1970: 3420

1964: 8" Canister

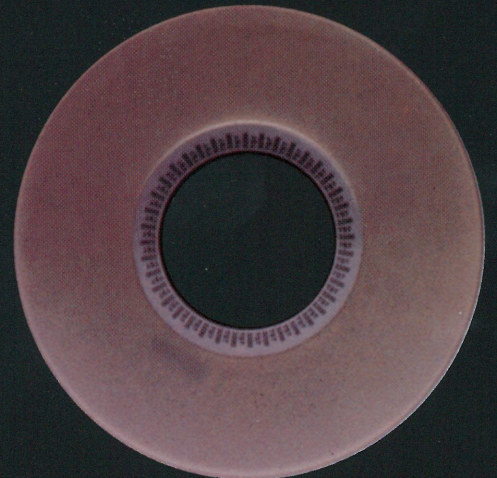


1972: 3420 Canister

1970: 3420 Cartridge



1964: 8" Reel

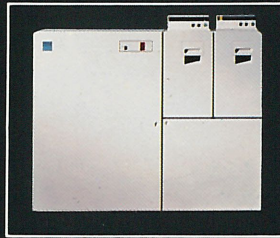


1970: 3420 Reel





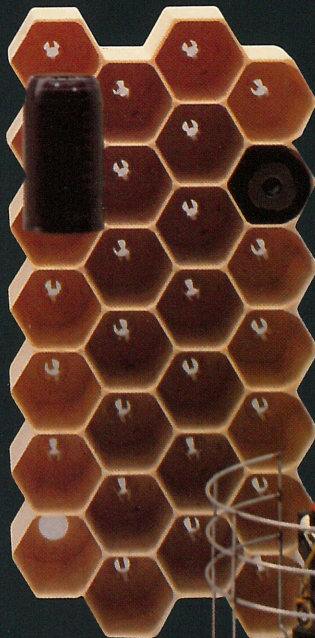
1983: 3430



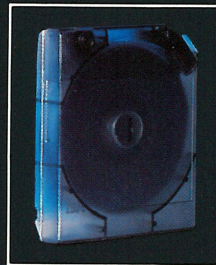
1984: 3480 Magnetic Tape Subsystem  
Density: approximately 38,000 bpi  
Speed: approximately 79 ips  
Features: streaming, buffering, outboard intelligence

Building upon the evolutionary developments shown here, the 3480 Magnetic Tape Subsystem has taken a dynamic step forward to satisfy the need for high-speed, reliable processing of sequential data at a reasonable cost.

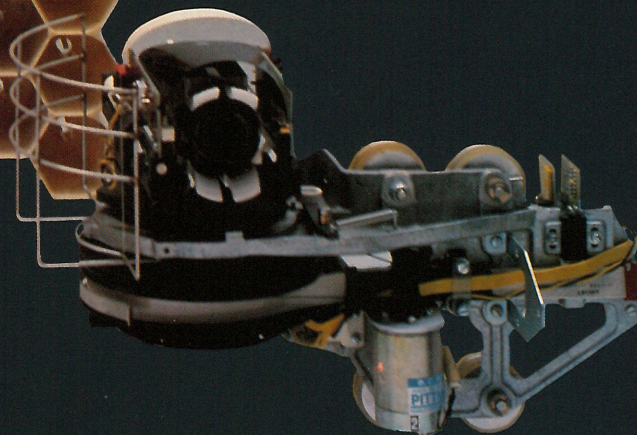
1974: MSS  
Cartridge



1974: MSS  
Honeycomb



1984: 3480 Tape Cartridge



1974: MSS  
Cartridge Picker  
Assembly

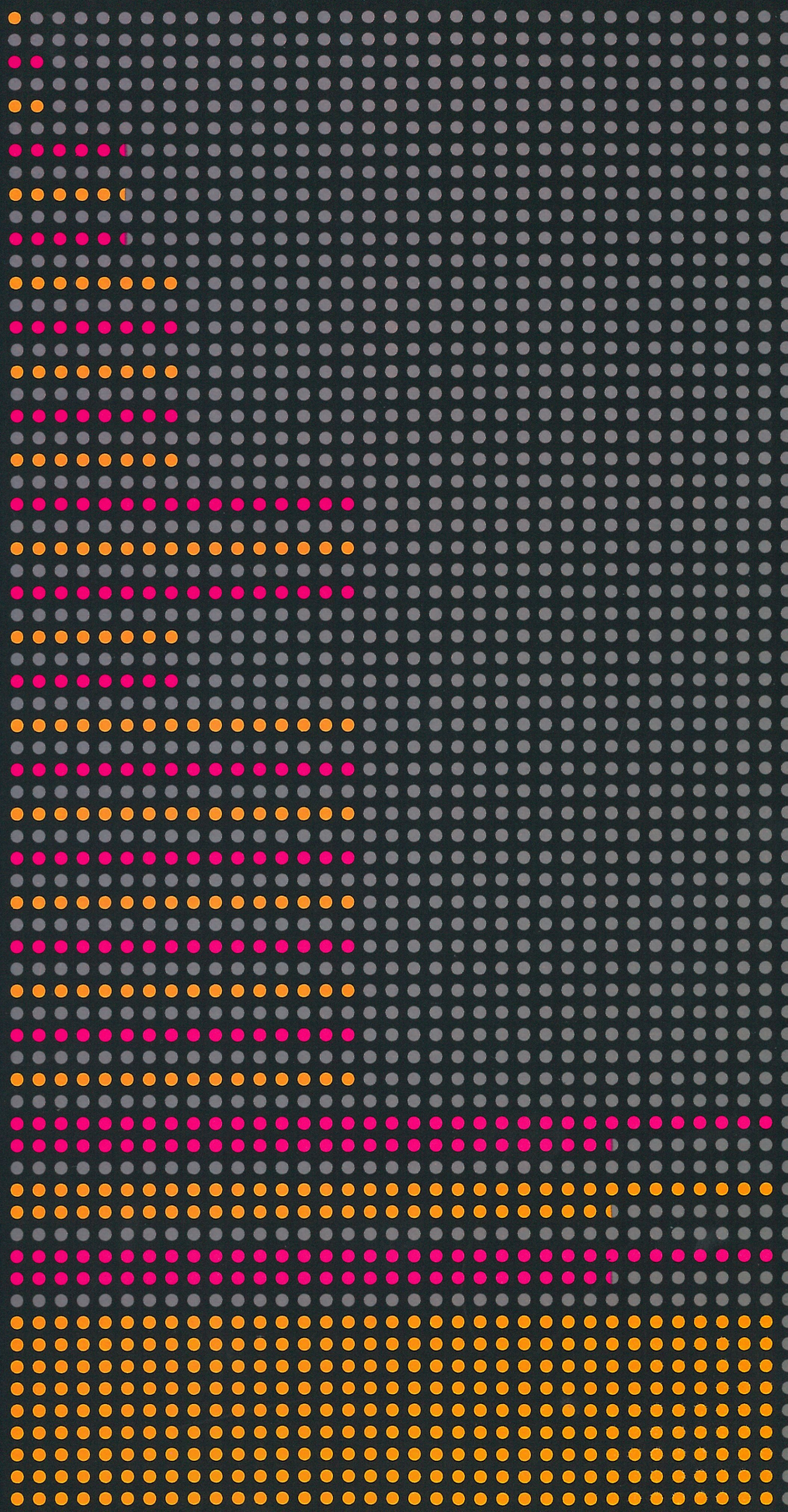




Ann. Date Tape Unit BPI IPS

# Memories, memories: more than three decades of development in magnetic tape technology

1952	726	100	75
1953	727	200	75
1957	729I	200	75
1957	729III	556	112.5
1958	729II	556	75
1958	729IV	556	112.5
1961	729V	800	75
1961	729VI	800	112.5
1964	2401-1	800	37.5
1964	2401-2	800	75
1964	2401-3	800	112.5
1965	2401-4	1,600	37.5
1965	2401-5	1,600	75
1965	2401-6	1,600	112.5
1970	2401-8	800	75
1965	2415-1	800	18.75
1965	2415-4	1,600	18.75
1968	2420-5	1,600	100
1968	2420-7	1,600	200
1971	3410-1	1,600	12.5
1971	3410-2	1,600	25
1971	3410-3	1,600	50
1970	3420-3	1,600	75
1970	3420-5	1,600	125
1970	3420-7	1,600	200
1973	3420-4	6,250	75
1973	3420-6	6,250	125
1973	3420-8	6,250	200
1984	3480	38,000	80



1970:





## **Reliability: replacing things that break with things that don't**

The design of the 3480 relies less on mechanical parts and more on longer-lasting electronic components. Some parts have been eliminated, others improved and repackaged. The need for repairs, compared with the 3420 tape drive, has been greatly reduced; there is, in fact, no scheduled preventive maintenance for the 3480 tape subsystem.

The uniform, high-quality, thin film read/write head and the simplified tape path provide a stable, controlled head media interface which increases data reliability, and this reliability is further improved by a new recording format featuring an expanded error-correction method called Adaptive Cross Parity. Thus, 3480 data reliability is much better than that of the 3420. In the operating environment, this means less time spent on reruns, more on productive throughput.

The 3480 uses a built-in Maintenance Device to diagnose failures, thus reducing its dependence on the host.

Simplified architecture, fewer major hardware components, and implementation of self-incriminating circuits — all these contribute to greater reliability and less total repair time.





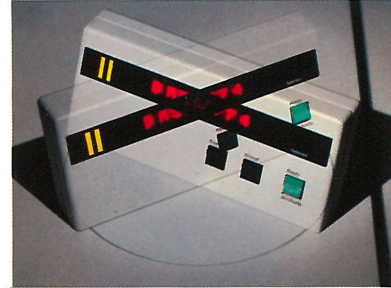
## **Productivity: of space, energy, and people**

The 3480 tape subsystem requires about 60% less floor space, power, and air conditioning than an equivalent 3420-8 configuration.

The 3480 also contributes to the productivity of people. Its tape cartridge is easy to use, compact, and lightweight. It is about 4 x 5 x 1 inches (approximately 10 x 12.5 x 2.5 cm) in size, and data is written on 18 tracks at a density of approximately 38,000 bytes per inch. The cartridge occupies about one-fourth the volume of a 10½" reel, yet at 24K block sizes it can store up to 20% more data.

The 3480 cartridge helps to protect the tape from external contaminants and damage. When the operator inserts a cartridge into the B22 tape unit, the drive does the rest. The cartridge is automatically opened and the tape threaded through the transport, past the read/write heads and onto the permanent take-up reel.

An 8-character display panel on each transport is used for operator communication. The display can be rotated for convenient viewing, and guidance messages help to prevent mismounts.



Even maintenance is more convenient. Manual cleaning has always been a time-consuming chore, often inconsistently performed. On the 3480, a cleaning cartridge, recommended for use just once a week, cleans a drive in less than a minute, with consistent results. (If more frequent cleaning is required because of high usage, the subsystem presents the word "CLEAN" on the display.)

With such operator aids, users can expect increases in productivity, not only of operators but of the entire data center.



## **Compact cartridges, for substantial improvements in storage and handling**

The 3480 cartridges require less than 50% of the storage space needed for existing rack-mounted 10<sup>1</sup>/<sub>2</sub>" reels. Storage cabinets from IBM can be ordered either as single-sided or as double-sided, back-to-back units. They can be arranged in a variety of space-effective configurations.

A media cart and cartridge carrying case are also available for ease in moving cartridges.



## **A sensible plan for migration**

Migrating your tape library to cartridges can be accomplished with relatively little disruption. In the course of everyday production, using appropriate controls, the input volumes can be read as reels and the output volumes written as cartridges.

In a typical tape library, up to 25% of the volumes may be archival and may not need to be converted, if tape units are available to process them.

Media replacement programs (typically 10 to 20% of total tape volume annually) should be redirected to acquisition of cartridges as one means of minimizing costs as you implement the 3480 tape subsystem.

Complete details about migration can be found in the Migration Guide (GR20-4788).





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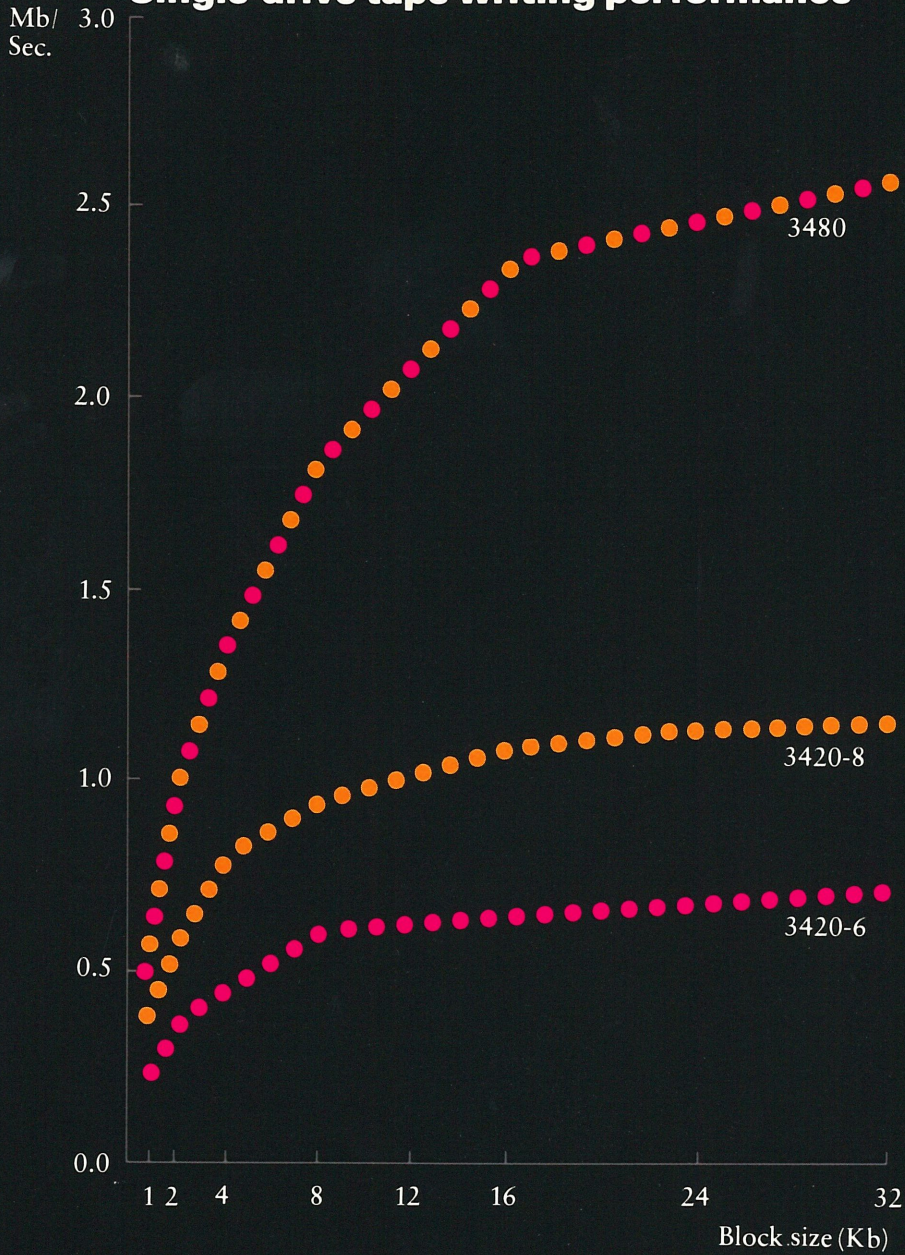
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## Single-drive tape writing performance



Based upon laboratory tests. Individual test results may vary. All tape subsystems were attached to a data-streaming channel on an IBM 3081 in a contention-free environment.

## Data reliability

Megabytes processed with one permanent read error



Based on laboratory tests. Individual tests will vary.



## Technical characteristics

### IBM 3480-A22 Control Unit

data buffer size	512 Kbytes
maximum channel data rate	3.0 Mb /sec
maximum channel attachment	4
maximum drive units per controller	4

### Media

approximate cartridge size	4 x 5 x 1 inches 100 x 125 x 25 mm
cartridge capacity (Mb at 24K blocks)	200 Mb

### IBM 3480-B22 Tape Unit

number of tracks	18
data density	
— approximately	38,000 bytes per inch
— approximately	1,500 bytes per mm
interblock gap	0.08 inches 2.0 mm
tape speed	approximately 79 inches /sec 2.0 meters /sec
nominal data rate	3.0 Mb /sec
cartridge load time	7 sec
rewind time	maximum 48 sec

## Physical specifications

### IBM 3480-A22 Control Unit

dimensions	front	side	height
(inches)	26	29.5	39.5
(mm)	660	750	1,000
service clearances	front	left side	rear
(inches)	36	24	36
(mm)	915	610	915
weight (lbs)	430		
(kg)	195		
heat output (BTU /hour)	2,870		
power requirements (kVA)	1.0		

### IBM 3480-B22 Tape Unit

dimensions	front	side	height
(inches)	20	29.5	39.5
(mm)	511	750	1,000
service clearances	front	right side*	rear
(inches)	36	24	36
(mm)	915	610	915
weight (lbs)	340		
(kg)	154		
heat output (BTU /hour)	4,250		
power requirements (kVA)	1.50		
number of transports			
per unit	2		

For more information about saving time, space, and costs while improving your tape processing operation with the IBM 3480 Magnetic Tape Subsystem, please contact your IBM marketing representative.

\*End unit only





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