IBM 3480
Magnetic Tape Subsystem

Introduction

GA32-0041-3

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Fourth Edition (Sept 1986)

This is a revision of and makes obsolete GA32-0041-2.

Changes or additions to the text or illustrations will be indicated by a vertical line to the left of the change.

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Preface

This publication is intended for readers who need only a basic understanding of the subsystem; the material is presented as follows.

- Subsystem Overview—introduces the subsystem, its advantages, the primary applications in which it is used, and brief descriptions of the magnetic tape cartridge, the tape unit and tape drives, and the control unit.
- Features—describes the significant standard and special features of the 3480 subsystem.
- Configurations—describes the 3480 subsystem configurations and attachments, including the use of the special features.
- Program Support—describes the operating subsystem and licensed program support that is available for the subsystem.
- Migration—describes, at a high level, the hardware and programming requirements for migrating or converting to a 3480 subsystem.
- Glossary—defines the terms, abbreviations, and acronyms used in this book.

Although there are no prerequisite publications for understanding the information in this publication, the reader should have a basic knowledge of magnetic tape subsystems.

Related publications include:

- *IBM Input/Output Equipment Installation Manual—Physical Planning for System/360 and System/370,* GC22-7064
- *IBM System/370 Installation Manual—Physical Planning,* GC22-7004
- *IBM 3480 Magnetic Tape Subsystem Planning and Migration Guide,* GC35-0098.

Contents

Summary of Amendments

IBM 3480 Magnetic Tape Subsystem Introduction

Release GA32-0041-3, September 1986

This edition adds information on the 3480 Model A11 Control Unit and Model B11 Tape Unit, including:

- Configuration information
- Field upgrade information
- The instantaneous drive data rate for Model B11
- The Dual Communications feature for Model A11.

There are also miscellaneous changes to correct errors or omissions in the previous edition.

Release GA32-0041-2, July 1986

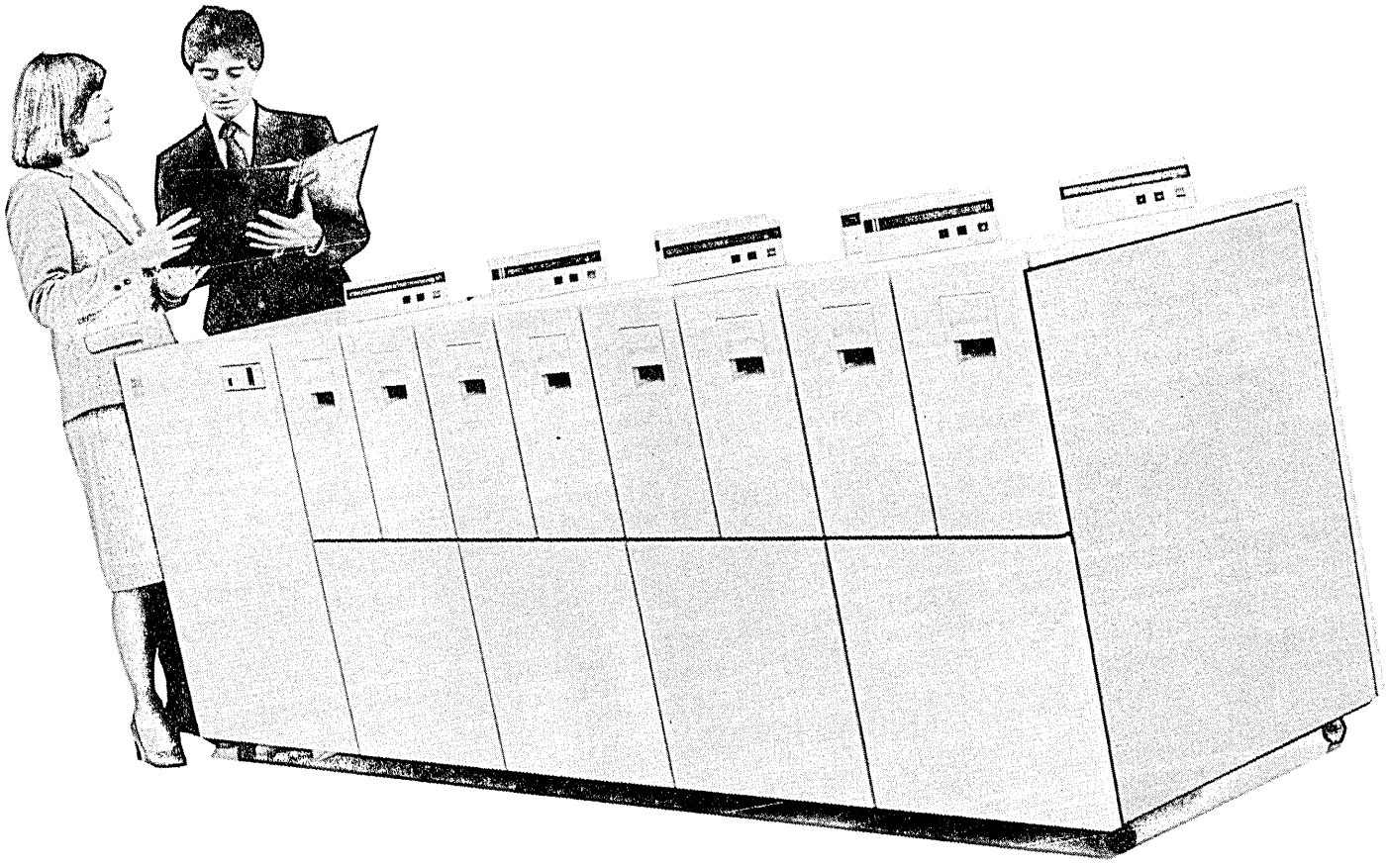
This edition adds information on the Automatic Cartridge Loader Feature, including:

- A general description of the Automatic Cartridge Loader
- A description of the three operating modes available on the loader
- Load/unload time for a drive with a loader.

There is also additional information on the High-Speed Search feature, along with miscellaneous changes to correct errors or omissions in the previous edition.

Release GA32-0041-1, October 1985

This edition contains miscellaneous changes to correct errors or omissions in the previous edition.



IBM 3480 Magnetic Tape Subsystem

Subsystem Overview

The 3480 Magnetic Tape Subsystem is a new, higher performance, more reliable magnetic tape subsystem. The 3480 subsystem consists of buffered, microprocessor-controlled 3480 Control Units, Models A11 and A22, and compact 3480 Tape Units, Models B11 and B22. Each tape unit contains two microprocessor-controlled tape drives that use a cartridge-enclosed magnetic tape.

The 3480 Magnetic Tape Subsystem has the following standard features:

- A compact design with table-height front loading for ease of operation.
- A small reel of chromium-dioxide tape that is enclosed in a compact cartridge for greater tape protection and automatic tape threading. This new, 18-track, high-density tape cartridge has a data capacity greater than that of a standard 6250-BPI 2400-foot tape when the 3480 is used with a block size larger than 4K-bytes.
- A microprocessor-controlled reel-to-reel tape drive that moves the tape without the need for capstans or complex vacuum columns.
- A message display on each tape drive that presents important information to the operator.
- A 3480 control unit that uses a microprocessor and a buffer to precisely control the flow of data within the subsystem.
- An instantaneous drive data rate of 1.5 megabytes-per-second for Model B11.
- An instantaneous drive data rate of 3.0 megabytes-per-second for Model B22.
- Internal workload balancing to provide more efficient use of the available tape drives.
- Resident error-recovery procedures that handle most of the temporary errors that might occur, thus reducing channel and processor usage.

In addition, the subsystem design reduces the physical complexity of the subsystem so that it is simple to operate, and fast and easy to load.

Furthermore, the subsystem design permits:

- The use of advanced servicing techniques that increase the time that the subsystem is available for customer use.
- Increased subsystem data reliability because of the new media and cartridge, thinfilm head, and increased error correction.
- Premounting and automatic feed of tape cartridges on tape drives that have the Automatic Cartridge Loader feature.

- Alternate path support, with appropriate operating systems, for subsystems that have the Dual Control Unit Communications Coupler feature or that have multiple Channel Attach, Additional features.

- Reduced power and cooling requirements, compared to previous IBM tape subsystems, because of the reduced size of its mechanical assemblies and advanced logic technology.

The 3480 subsystem can be attached to nonstreaming (block) multiplexer channels on 303X, 4341, 4361, 4381, 308X, and 3090 processors. It can also be attached to 2.0 megabyte per-second streaming channels on the 4341 and 4381 processors; and to 3.0 megabyte per-second streaming channels on the 303X (with the data streaming feature), and to the 4341, 4381, and 308X processors.

The smallest 3480 subsystem consists of one control unit, a single-channel attachment to a host processor, and two tape drives in a tape unit. The largest 3480 subsystem, with all special features, contains:

- Two control units

- Eight channel attachments

- Sixteen tape drives (in eight tape units)

- Sixteen Automatic Cartridge Loaders.

In the largest configuration, a communication path exists between the two 3480 control units and between each 3480 control unit and the sixteen tape drives in the subsystem.

Tape Unit Model B11 can attach only to Control Unit Model A11. Tape Unit Model B22 can attach only to Control Unit Model A22. In a dual-control-unit subsystem, both control units must be the same model, and all tape units must be the same model.

Subsystem Characteristics

The following table shows some of the major characteristics of the 3480 Magnetic Tape Subsystem.

Control Unit	Buffer size	512K bytes
	Channel data-streaming rate	Up to 3.0 megabytes/sec
Drive	Data Density	Approximately 1500 bytes/mm (38,000 bytes/inch)
	Load/unload time	5-10 seconds
	Load/unload time on drives with the Automatic Cartridge Loader feature	Approximately 15 seconds including one index cycle
	Rewind time	48 seconds
	Drive data rate, Model B22	Nominally, 3.0 megabytes/sec
	Drive data rate, Model B11	Nominally, 1.5 megabytes/sec
Cartridge	Tape size	1/2 inch
	Number of tracks on tape	18 tracks
	Data capacity	Nominally, 200 megabytes (when a block size of 24K is used)

Applications

The 3480 Magnetic Tape Subsystem provides increased capacity, performance, and reliability. In addition, the 3480 subsystem provides increased function such as:

- High-speed search—to quickly locate desired data
- Message display—for volume, status, and guidance messages
- Processor assignment (which includes logical partitioning)—to reserve drives.

The 3480 subsystem is supported with both full-function and code compatibility programming. Not all 3480 functions are available with code compatibility support. Refer to "Program Support" for additional information and qualifications.

The 3480 subsystem supports the tasks associated with tape applications, including journaling, archiving, processing, and backup/recovery.

The 3480 subsystem operates at an instantaneous data rate that is compatible with the requirements of current DASD. Because of its increased recording density and compact size, the magnetic tape cartridge can store more data in less physical space than is now required for existing tape libraries. This attribute makes the magnetic tape cartridge a cost-effective method of meeting both the archiving and the backup-and-recovery requirements for a tape subsystem.

Magnetic Tape Cartridge

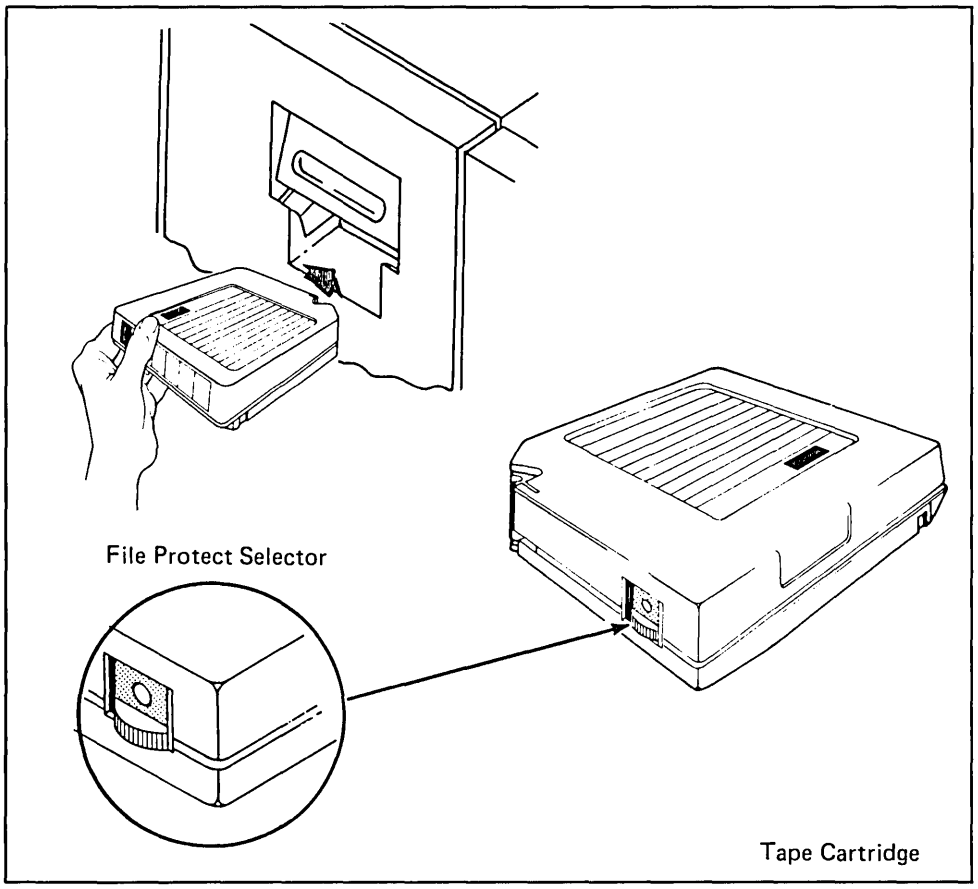
The 3480 Magnetic Tape Subsystem uses an 18-track recording format on half-inch tape contained within a new magnetic tape cartridge. The cartridge has a nominal data capacity of 200 megabytes (when a block size of 24K bytes is selected) and in most cases it can contain more data than a 2400-foot reel using the same block size.

The small physical size of the cartridge permits a significant increase in the number of tapes that can be stored in the same space as that previously occupied by the larger, 10.5-inch open-reel tapes.

The tape cartridge remains closed during storage and handling to help protect the tape from external contaminants. When a tape cartridge is inserted into a tape drive, the tape drive pulls the tape out of the cartridge and threads the tape onto a nonremovable machine reel in an automatic load operation.

Each tape cartridge includes a file protect selector that, when set, prevents data from being written on, or erased from, the tape.

A tape cartridge can be visually identified by a volume/serial number label on the edge of the cartridge. A larger, customer information label can be used on the top of the cartridge. The tape may also use standard tape labels recorded magnetically on the tape by a host program.



3480 Models B11 and B22 Tape Units and Tape Drives

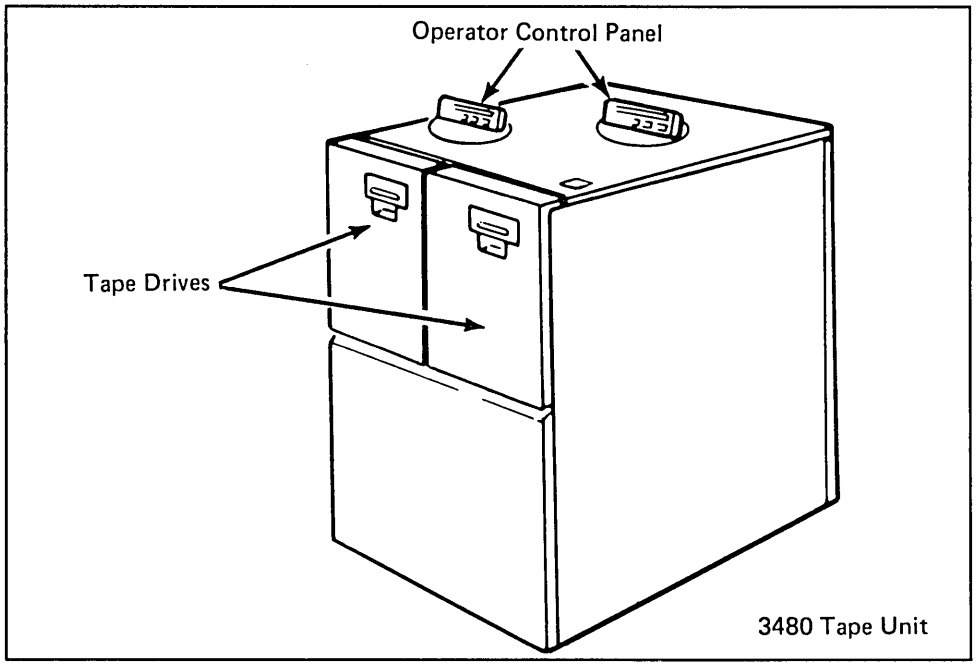
The 3480 Models B11 and B22 Tape Units contain the compact, self-threading, reel-to-reel tape drives that use the magnetic tape cartridge. There are two tape drives in each tape unit. Each tape unit contains the mechanical and electrical assemblies necessary to operate the tape drives. Each tape drive contains a mechanical assembly for moving and threading the tape. A microprocessor, within the tape drive, controls tape motion. Electronic circuitry for reading and writing are also contained within each tape drive. No capstans or vacuum columns are used.

The major characteristics of the tape drives are:

- Data density of approximately 1500 bytes per millimeter (approximately 38,000 bytes per inch)
- Load/unload time of 5 to 10 seconds
  The load/unload time on a drive with the Automatic Cartridge Loader, including one index cycle, is approximately 15 seconds.
- Maximum rewind time of 48 seconds
- Nominal data rate of 1.5 megabytes per-second for Model B11
- Nominal data rate of 3.0 megabytes per-second for Model B22.

An operator control panel is part of each tape drive. The message display on the operator's panel can show drive status, error information, and other action information sent by either the tape drive or by an attached host processor. The operator panel can be turned to best meet the viewing requirements of the operator. A special cleaning cartridge is supplied with each control unit for maintaining the tape drive's operating efficiency.

Model B11 tape units can be field upgraded to Model B22 tape units.



3480 Models A11 and A22 Control Units

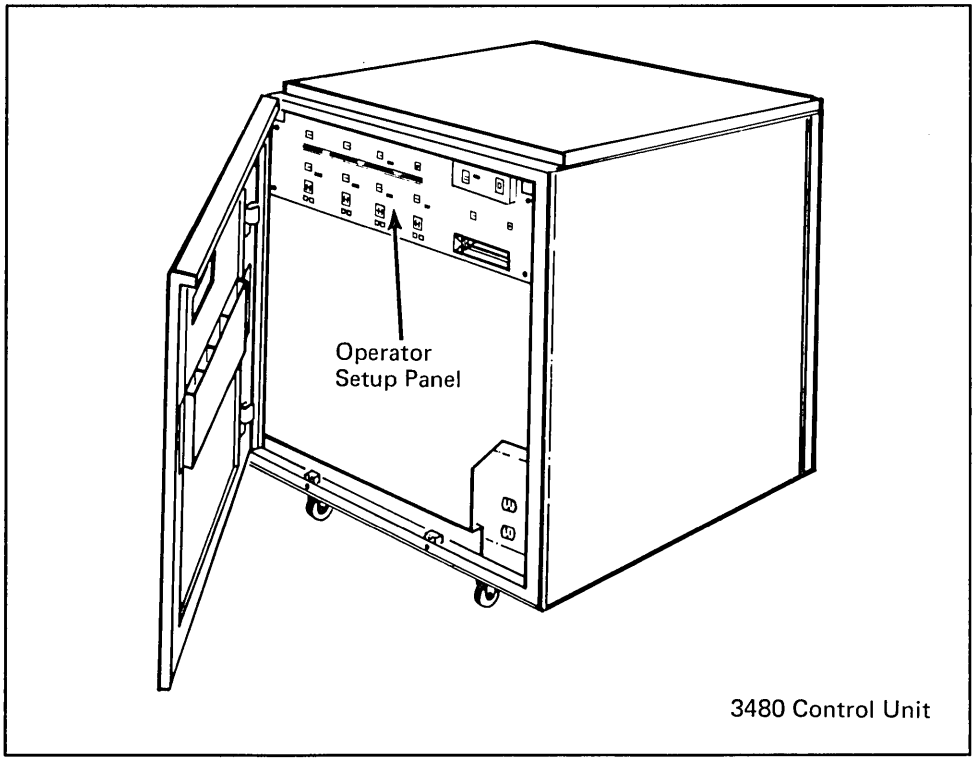
3480 Models A11 and A22 Control Units contain the logic for interpreting channel commands, controlling the data flow, and managing buffer operations. The subsystem operator setup panel contains the subsystem Power On/Off switch, IML switch, and all channel and control unit controls. This panel is located inside the front cover of the control unit. The Unit Emergency Power Off and Power On/Off switches are accessible through an opening in the front cover.

Each control unit contains a 512K-byte buffer that increases effective data rates and reduces subsystem use of the channel when compared to previous IBM tape subsystems. The buffer is partitioned among the attached active drives under internal buffer-management control. A microprocessor, within the control unit, manages the flow of data between the drives and the channels.

Data is transferred between the buffer and the channel at channel data-transfer rates. It is not necessary for the system processor to wait for the drive to respond to read and write commands, thus improving channel efficiency.

During read-mode operations, the availability of a buffer permits the control unit to give rapid responses to host Read commands by prereading multiple data records, from drives, into the buffer. Similarly, during write-mode operation, multiple data records can be transferred from the host processor to the control unit's buffer at channel speeds. It is not necessary to wait for the tape drive to record the data on the tape. A tape-write-immediate mode of operation may be selected for specific operations that require the data to be recorded and verified on the tape before channel operation is ended.

Model A11 control units can be field upgraded to Model A22 control units.



3480 Control Unit

Resource Management

The 3480 subsystem represents a major advance from previous IBM magnetic tape subsystems in the area of resource management.

Because data is buffered in the control unit, internal control unit functions are used to make effective use of the buffer resource. Multiple read and write commands, and their associated data, are placed in a queue in the control unit and processed to or from a selected tape drive in a single tape drive operation. This process is similar to QSAM buffering used by the I/O Supervisor. Operations between the channel and the buffer occur asynchronously with operations between the buffer and the tape drive.

With the addition of the Dual Control Unit Communications Coupler feature two 3480 control units work together to monitor and balance the work load within this larger, combined 3480 subsystem. This automatic load-balancing makes efficient use of both control unit resources and requires no programming support from the system processor.

Although the drive operates at a nominal drive data-transfer rate of 1.5 (Model B11) or 3.0 (Model B22) megabytes-per-second, the control unit's buffer and microprocessor manage the data-transfer rate to conform to a variety of system channel types and data-rate requirements.

Features

The 3480 Magnetic Tape Subsystem has many standard features, and three special features. Standard features are included with all subsystems; special features may be ordered through your IBM marketing representative.

Standard Features

The 3480 subsystem includes all the features and functions of previous IBM magnetic tape subsystems plus some significant new features. The tape cartridge, 3.0 megabyte-per-second channel data-transfer rate, and increased reliability have already been described.

Tape loading is significantly simplified in the 3480 subsystem. When a magnetic tape cartridge is loaded into a tape drive, the tape leader block is pulled from the cartridge and the tape is threaded, by the drive, onto a nonremovable machine reel for an automatic load operation.

The file protection function incorporates a file protect selector as a part of the cartridge. It is manually set, as required, to protect the recorded data or to allow overwrite or erasure. When set for protection, it prevents data from being written on the tape and prevents any data already written on the tape from being erased.

In addition, many improvements have been made to the standard features and several new standard features have been added. Some of the more significant changes include:

- Read/write buffering
- Processor assignment
- High-speed search
- Message display.

Refer to "Program Support" for additional information and qualifications.

Read/Write Buffering

The 3480 control unit contains a storage area that is used to buffer the flow of read and write data. This buffering action permits the 3480 subsystem to respond rapidly to read and write data requests, which results in improved channel utilization, as compared with previous IBM tape subsystems. Both read and write operations are handled concurrently in the buffer. Buffered-read mode is used for reading data; it permits the rapid transfer of data from the control unit's buffer to the host processor. The buffered-read mode is enhanced by the control unit's buffer, allowing the control unit to anticipate demands for data by reading ahead and storing multiple blocks of data in the buffer. The effect of this read-ahead ability is that the control unit has already read the tape before the actual request for data is received, thus resulting in a rapid response to channel requests for data. Data written on the 3480 subsystem tape can be read in either a forward or backward direction.

The 3480 subsystem has two modes of operation for writing data: buffered-write mode and tape-write-immediate mode. Either mode can be selected by a command from the host processor; however, buffered-write mode is the default mode of operation. The user can select the tape-write-immediate mode by using Job Control Language (JCL), or from within the user program.

Buffered-write mode permits data to be transferred at full channel speeds into the control unit buffer. After the complete data block is transferred to the buffer, the control unit signals normal completion before the data is on tape. This signal allows both the channel and processor to proceed with other work, including the transfer of another block of data to the control unit's buffer for either the same drive or a different drive. The control unit transfers the data to the correct tape drive without further channel assistance.

Tape-write-immediate mode differs from buffered-write mode in that the data is written on the tape and verified before the next block of data, for the same device, can be transferred from the processor to the control unit's buffer.

Processor Assignment

If the 3480 subsystem is connected to more than one host processor, individual tape drives can be exclusively assigned to a specific host processor. This feature prevents a drive from being used by another host processor. If no Assign commands have been issued to a tape drive, any attached host processor may use that drive. Drive Assign and Unassign commands are issued either by the host operating system or by an operator-initiated command.

The processor assignment feature is available only with full-function software support. Refer to "Program Support."

High-Speed Search

This feature, which is supported by Data Facility Hierarchical Storage Manager (DFHSM) and dynamic device reconfiguration (DDR), permits a high-speed block search to position the tape to a selected block. Once started, the tape drive selected to do the search can perform the search independently from the control unit, if the distance to be moved is greater than a minimum amount. Also, during the search operation, the control unit can logically disconnect itself from the channel, thus freeing the channel for other work. In previous IBM magnetic tape subsystems, block positioning required Forward Space Block commands. With the 3480 subsystem it takes only a single Locate command to position over as many blocks as necessary to find the desired data.

A user can modify their code to use NOTE and POINT if they want to use high-speed search for their own applications. Refer to "Program Support" for additional information and qualifications.

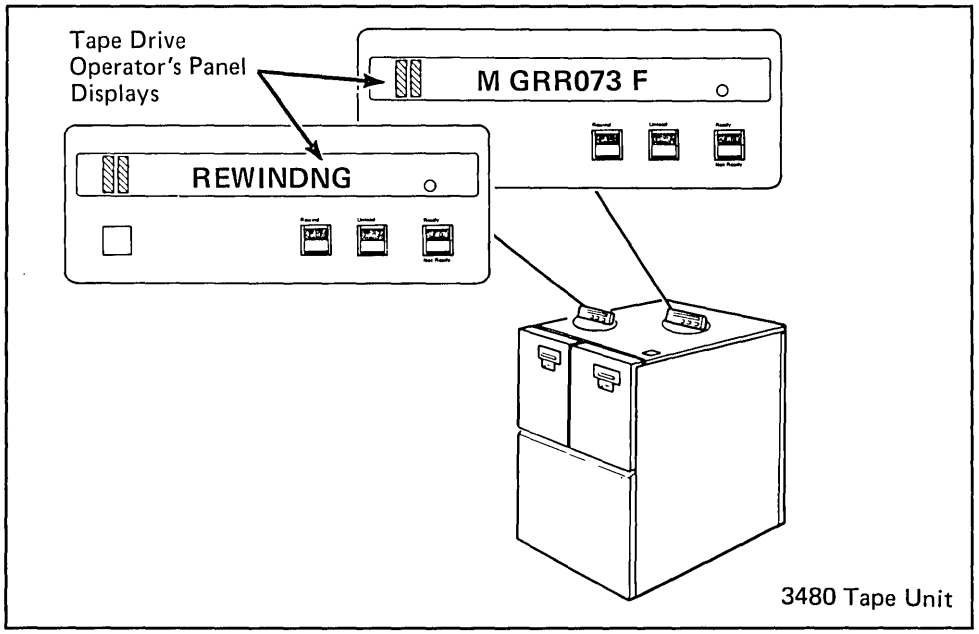
Message Display

Each drive has an eight-character message display as part of the operator's panel. Information that can be displayed includes:

- The volume identification number of the tape cartridge that is to be mounted.
- The status of the drive and of the tape cartridge that is mounted.
- Operator guidance instructions.
- Host processor messages and error codes, if supported by the host's operating system (refer to "Program Support" for additional information and qualifications).

Drive-initiated status messages are displayed in the following languages, as specified by feature codes:

- English
- French
- German
- Italian
- Spanish.



Special Features

The 3480 Magnetic Tape Subsystem offers the following special features, which can be ordered separately through an IBM marketing representative:

- Dual Communications (control unit Model A11 only)
- Dual Control Unit Communications Coupler
- Channel Attach, Additional
- Automatic Cartridge Loader.

Dual Communications

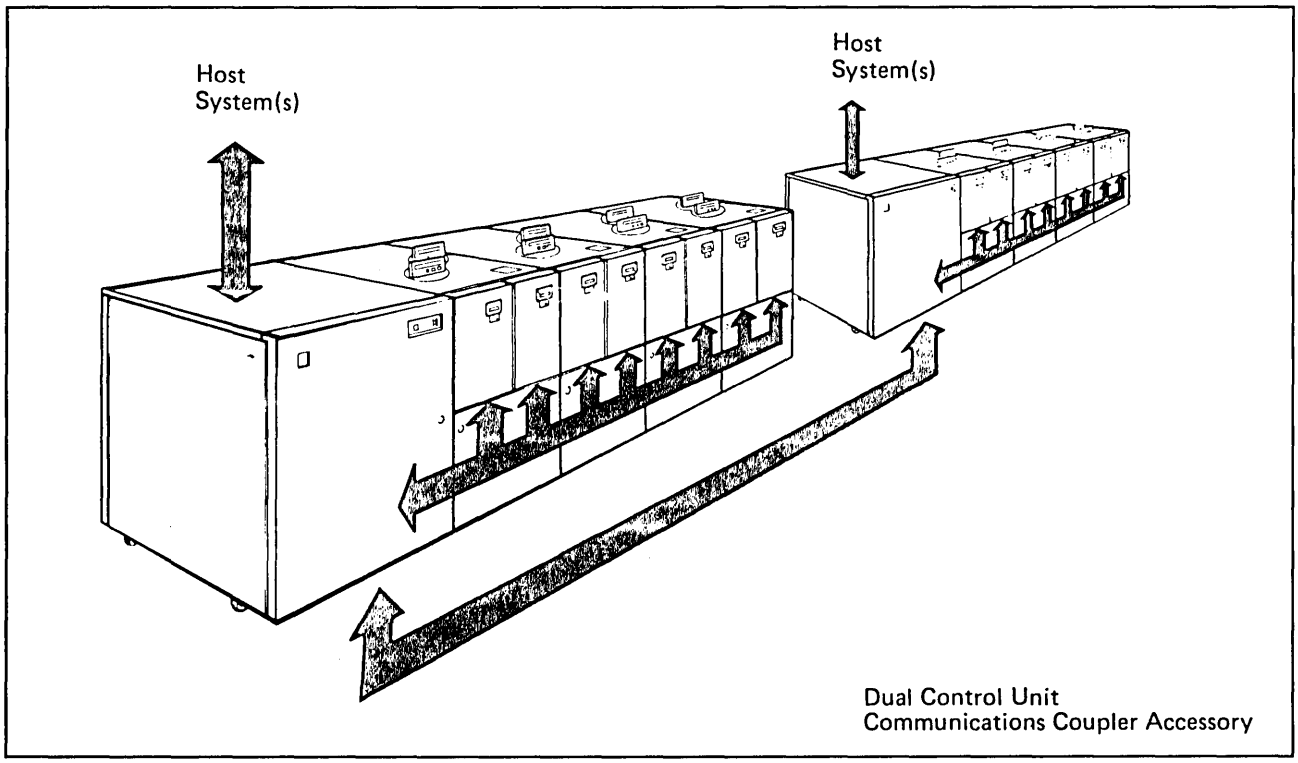
The Dual Communications feature is for 3480 Model A11 control units only. This feature adds the internal cabling and logic necessary to support the Dual Control Unit Communications Coupler feature, and is required only if you want that feature. 3480 Model A22 control units support the Dual Control Unit Communications Coupler feature without any additional requirements. For more information on dual control unit communication, see "Dual Control Unit Communications Coupler" on page 13.

Dual Control Unit Communications Coupler

The Dual Control Unit Communications Coupler feature consists of coupler cables that connect the control units together. This feature establishes a communication path between two 3480 control units and creates a two-control-unit subsystem. Either control unit can operate independently of, or with, the other control unit. Commands from the host processor, individual tape drive status, and data from either 3480 control unit are sent to the other control unit for action, when necessary, to coordinate the entire subsystem's activity.

In addition, this feature permits either control unit to address any tape drive in the subsystem, regardless of the control unit to which the drive is primarily attached.

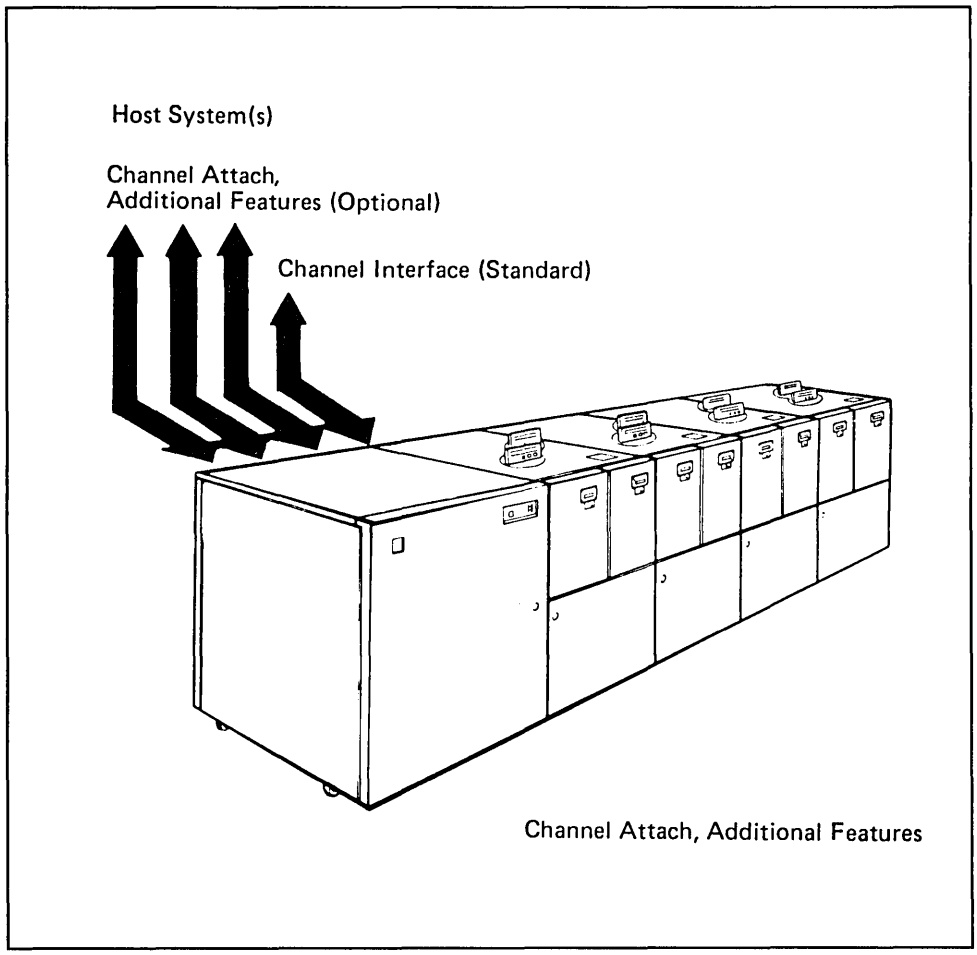
The 3480 Model A11 control unit requires the Dual Communications feature in addition to this feature before dual control unit communications can be established.



Channel Attach, Additional

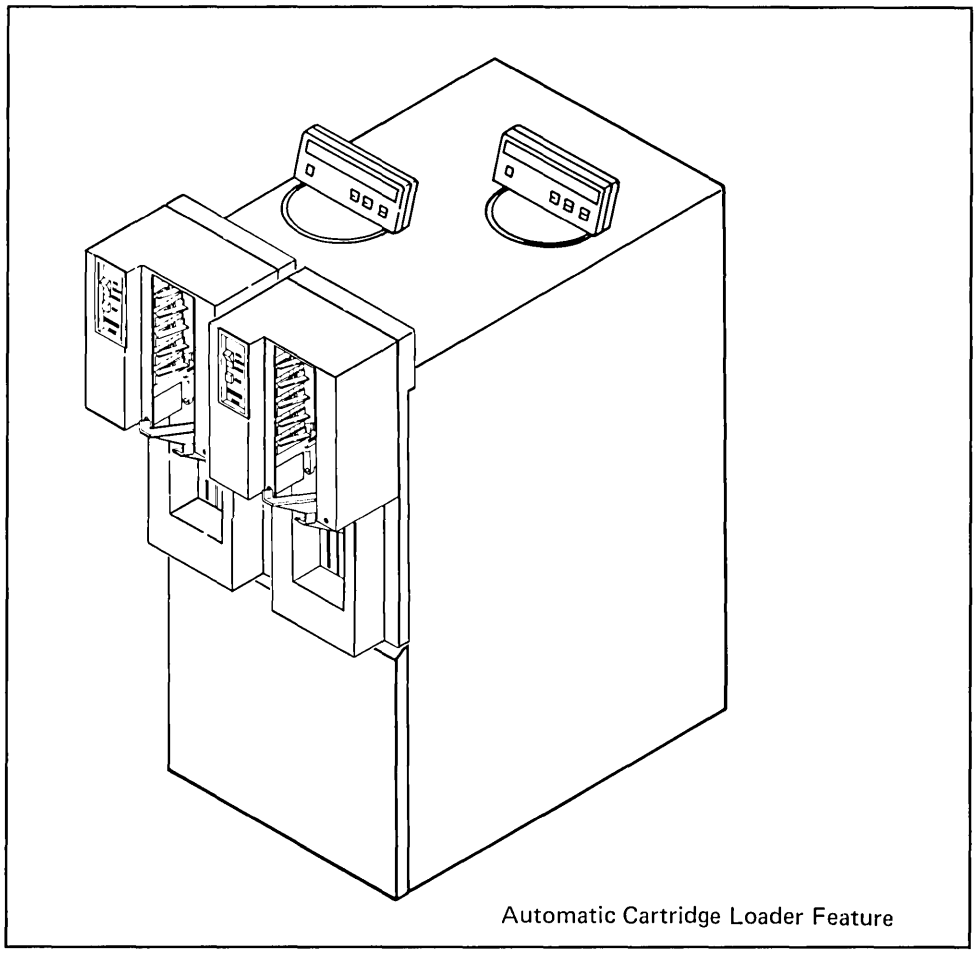
There are three Channel Attach, Additional features available: Channel Attach, First-, Second-, and Third-Additional. These features permit additional channel connections to a host processor. Up to three of these features can be added to a 3480 control unit for a total of four channel connections. These channel connections can be to either the same host processor or to different host processors.

With a full complement of Channel Attach, Additional features, (First, Second, and Third) and the Dual Control Unit Communications Coupler feature, a 3480 subsystem with two control units can have up to eight channel attachments.



Automatic Cartridge Loader

The Automatic Cartridge Loader (loader) is a feature for the 3480 tape drive. The loader attaches to the front of the drive and allows both the automatic loading of premounted tape cartridges, and the manual loading of single tape cartridges. Up to six tape cartridges can be premounted on the loader.



Automatic Cartridge Loader Feature

The Loader Operator Panel on the front of the Automatic Cartridge Loader allows the operator to switch between the following modes:

- **Auto**, for automatic feeding and loading of premounted tape cartridges requiring no operator action.

- **System**, for system-controlled feeding and loading of premounted scratch tape cartridges. In this mode scratch tape cartridges are fed and loaded automatically in response to non-specific volume requests, while specific volume requests require operator insertion of the requested tape cartridge.

  An MVS operating system with 3480 full function support is required to use this mode.

- **Manual**, for a single tape cartridge feed performed by the operator.

Note: Auto mode does not have to be used for multiple tape cartridge mounts alone; it can also be used when the operator is inserting only one tape cartridge at a time. There are two benefits to this:

- When a cartridge is unloaded in auto mode, it is placed in the output stack, and the feed position is free to take another cartridge. (In manual mode, the cartridge must be removed from the feed position by the operator before another cartridge can be inserted, the same as a 3480 without this feature.)

- Cartridges in the output stack can be removed at the operator's convenience, or when the output stack is full (six cartridges).

Configurations

A 3480 Magnetic Tape Subsystem consists of the following units:

- 3480 Model A11 Control Unit
- 3480 Model A22 Control Unit
- 3480 Model B11 Tape Unit
- 3480 Model B22 Tape Unit.

A subsystem must have at least one control unit and one tape unit; each tape unit contains two tape drives. Up to four tape units can be connected to a control unit. A Model B11 Tape Unit can attach only to a Model A11 Control Unit, and a Model B22 Tape Unit can attach only to a Model A22 Control Unit.

One channel attachment is standard with each control unit. Up to three additional attachments can be made by including up to three Channel Attach, Additional features. Four channel attachments are the maximum number allowed with each control unit.

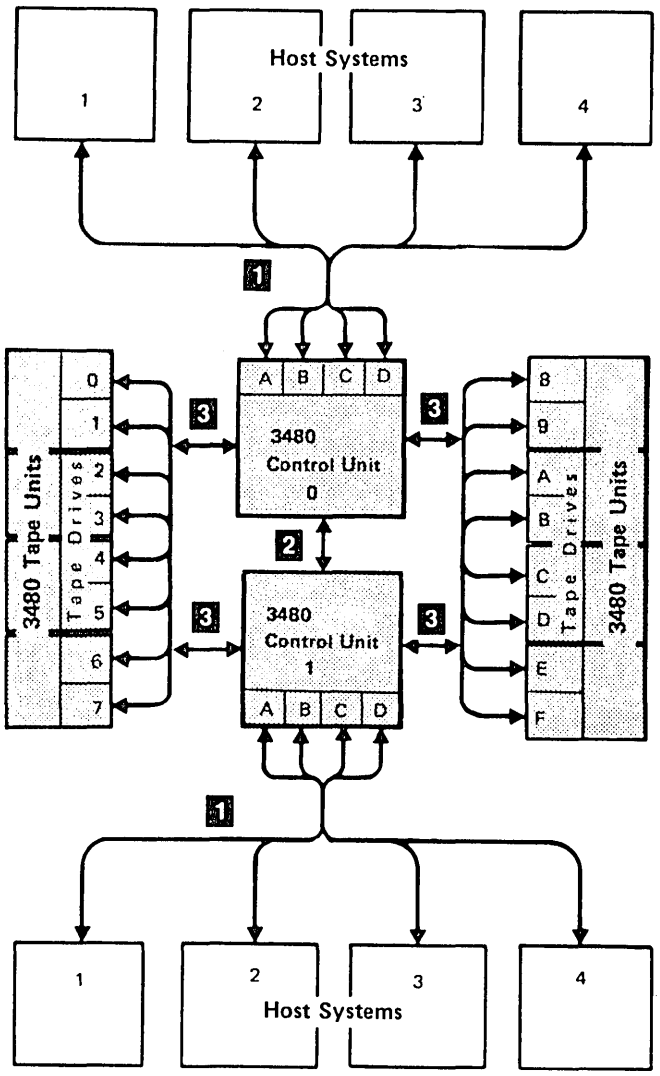
The Dual Control Unit Communications Coupler feature permits two control units to communicate with each other and with the tape drives attached to either control unit. This feature can only be used to connect control units of the same model. 3480 Model A11 control units require the Dual Communications feature for the electronics to support the Dual Control Unit Communications Coupler feature. 3480 Model A22 control units already have the necessary electronics built in.

Each control unit can directly address up to eight tape drives that are physically attached to it. With the Dual Control Unit Communications Coupler feature, each tape drive in the combined subsystem (two control units and their attached tape units) is attached by cables to both control units. This method of attachment permits direct addressing of any tape drive by either control unit, and channel data routing between control units.

The 3480 subsystem, using the units offered, and the Channel Attach, Additional feature and the Dual Control Unit Communications Coupler feature, can be assembled in a variety of configurations. Multiple subsystems can be used to satisfy the performance and availability requirements of each user.

A multiple-feature 3480 subsystem can have:

- Channel connections for up to four host processors for each control unit **1**
- Dual control units that communicate with each other **2**
- Sixteen tape drives, in increments of two, addressable by either control unit **3**.



Notes:
1. Subsystem units are shown shaded.
2. This illustration is symbolic only, and should not be used for physical layout of subsystem units.

Representative Configurations

Using the available machine units and special features, the following information gives some of the possible subsystem configurations.

The configuration notations, for example 3x1x8, mean that the subsystem is composed of:

- Three host processor channel attachments, two of which are special features
- One control unit
- Eight tape drives in four tape units.

Host System Channels	3480 Control Units	Drives	Configuration
1	1	2	1x1x2
1	1	4	1x1x4
1	1	6	1x1x6
1	1	2	1x1x8
2	1	8	2x1x8 (Note 1)
3	1	8	3x1x8 (Note 2)
4	1	8	4x1x8 (Note 3)
2	2	8	2x2x8 (Note 4)
4	2	8	4x2x8 (Notes 1, 4)
6	2	8	6x2x8 (Notes 2, 4)
6	2	16	6x2x16 (Notes 2, 4)
8	2	16	8x2x16 (Notes 3, 4)

Notes:

1. Requires Channel Attach, First Additional feature on each 3480 Control Unit
2. Requires Channel Attach, First and Second Additional features on each 3480 Control Unit
3. Requires Channel Attach, First, Second, and Third Additional features on each 3480 Control Unit
4. Requires the Dual Control Unit Communications Coupler feature for control unit Models A11 and A22, and the Dual Communications feature for Model A11.

Program Support

Conventional tape drive programming, including access methods, utilities, and job control language (JCL) is supported. The 3480 Magnetic Tape Subsystem is supported by IBM, with the Data Facility Product (DFP) licensed program.

Contact your marketing representative for applicable OS/VS2 MVS/System Product release levels. Most programs that run with currently available IBM tape subsystems will also run (with the addition of licensed programs) with the 3480 subsystem without recompiling or editing, except for error-recovery dependencies or device timing dependencies.

For additional information, refer to the *IBM 3480 Magnetic Tape Subsystem Planning and Migration Guide.*

Operating System Support

Operating system support for Multiple Virtual Storage (MVS) is available in two modes; full function and compatibility code.

Full Function Mode: Full Function mode supports the new 3480 features for:

- Read/write buffering
- Message display
- Processor assignment
- High-speed search
- Tape-write-immediate mode
- System mode on the Automatic Cartridge Loader feature.

The MVS S/370 or Extended Architecture (XA) System Products - JES2 or JES3 operating system, with the appropriate Data Facility Product (DFP) licensed program, supports all currently available magnetic tape functions, as well as the new 3480 standard features.

Compatibility Code Mode: Compatibility code mode *excludes* support for the following new 3480 features:

- Processor assignment
- Display messages
- High-speed search
- System mode on the Automatic Cartridge Loader feature

and also excludes the software support for

- Dynamic device reconfiguration (DDR).

The MVS S/370 or XA System Products - JES2 or JES3 operating system, with the appropriate Data Facilities Product (DFP) licensed program, supports currently available magnetic tape functions.

Most MVS utilities that use magnetic tape also support the 3480 subsystem.

Access methods, with licensed programs, that support the 3480 subsystem include:

- Basic Sequential Access Method (BSAM) under MVS/370
- Queued Sequential Access Method (QSAM) under MVS/370
- Execute Channel Program (EXCP) under MVS/370.

With the exception of device-specific parameters, standard JCL for tape applications can be used with the 3480 subsystem.

VSE 2.1.3 Refresh, and VM/SP 4.0 also support the 3480 subsystem.

Additional Licensed Program Support

Additional licensed program support is available for:

- Data-base applications
- High-level languages
- Application programs.

High-level languages that are used with the 3420 tape subsystems also can be used with the 3480 subsystem. These languages are:

- A Programming Language (APL)
- Beginner's All-Purpose Symbolic Instruction Code (BASIC)
- Common Business-Oriented Language (COBOL)
- Formula Translation (FORTRAN)
- Programming Language 1 (PL/I).

Most application programs that support magnetic tape products will support the 3480 Magnetic Tape Subsystem with minor changes to the JCL. The DFSORT Licensed Program uses the drives as sort-in/sort-out devices. The Sort program prior to Release 7.0 does not accept 3480 devices for the SORTWKnn files.

Migration

Migration or conversion from a previous IBM magnetic tape subsystem to the 3480 Magnetic Tape Subsystem consists of several basic tasks:

- System generation (SYSGEN) and testing of the operating system and licensed programs that support the 3480 subsystem
- Installing the 3480 subsystem units and testing them under control of the operating system
- Testing applications using the operating system, 3480 subsystem, application programs, and tape cartridges
- Modifying data sets (if required) and application program JCL that are to be used with the 3480 subsystem
- Moving existing data from the current tape to the new magnetic tape cartridge.

Additional information is available in the *IBM 3480 Magnetic Tape Subsystem Planning and Migration Guide.*

Hardware

The 3480 subsystem requires a block multiplexer channel and may share that channel with different device types. Two- and three-megabyte streaming channels may also be used, with selected processors, for greater channel flexibility.

Channel unit control words (UCWs) must be assigned so that each tape drive has a unique, unshared identifier.

Programming

A minimal amount of JCL conversion might be necessary to accommodate the 3480 subsystem. Generally, the changes required are similar to those necessary whenever a different device type is added to an existing system. This conversion includes, for example, JCL changes for unit parameters.

Some additional JCL coding is required to take advantage of the new facilities of the 3480 subsystem. This includes, for example, a new JCL parameter to specify tape-write-immediate mode.

Additional considerations should include a review of data control block (DCB) descriptions for tape data sets, and a review of programs using DEVTYPE macros for tape device types. Also, users that specify dynamic allocation should review their applicable programs for appropriate unit type descriptions.

Magnetic Tape Cartridge

Conversion to the 3480 Magnetic Tape Subsystem requires that data be transferred from existing recorded tape reels to tape cartridges.

Data can be moved from an existing magnetic tape product to the new tape cartridge in two ways:

1. Copying data from existing tapes to the new tape cartridges.

2. Substituting the new tape cartridge for the existing tape as processing generates new tape output files.

To determine which way is best requires examining the existing tape library composition and considering the application requirements.

Library storage procedures should be evaluated and changed, as necessary, to support the new, smaller tape cartridge. New library storage units are available that can increase the storage capacity of existing floor space by 50 to 100% over the storage requirements for a conventional 10.5-inch reel installation. Contact an IBM National Distribution Division representative for additional information.

Currently available magnetic tape products and the new magnetic tape cartridge are not interchangeable. Standard interchange and existing archiving applications, such as applications that create tape for data-transmission machines or offline microfilm/microfiche machines, might require that current, reel-type tape equipment be available for preparing and reading data on 10.5-inch tape reels.

Glossary

This glossary defines the special terms, abbreviations, and acronyms that are used in this publication. It does not include all terms previously established for the IBM System/370 or its operating systems; therefore, if you do not find the term you are looking for, refer to the index or to the *Vocabulary for Data Processing, Telecommunications, and Office Systems,* GC20-1699.

This glossary includes definitions developed by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO). This material is reproduced from the American National Dictionary for Information Processing, copyright 1977 by the Computer and Business Equipment Manufacturers Association, copies of which may be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

access method. A technique for moving data between processor storage and input/output devices.

archiving application. The retention of records, in machine-readable form, for historical purposes.

automatic cartridge loader. A feature for the 3480 tape drive. This feature attaches to the front of the drive and allows both the automatic loading of premounted tape cartridges, and the manual loading of single tape cartridges.

automatic mode. A mode of operation that can be selected on the Automatic Cartridge Loader feature. This mode allows the automatic feeding and loading of premounted tape cartridges requiring no operator action.

backup and recovery application. The short-term retention of records to be used for restoring essential business and system files when vital data has been lost because of program or system errors or malfunctions.

block. (ANSI) A collection of contiguous records recorded as a unit. Blocks are separated by interblock gaps and each block may contain one or more records.

buffer. (ANSI) A routine or storage used to compensate for a difference in rate of flow of data, or time of occurrence of events, when transferring data from one device to another.

channel. (ISO) A device that connects the processing unit and main storage with the input and output control units.

command. A control signal that initiates an action or the beginning of a sequence of actions.

control unit. A device that controls input and output operations at one or more devices.

conversion. The process of changing from one method of data processing to another or from one data processing system to another.

DASD. Direct access storage device.

data. (ANSI) Any representations such as characters or analog quantities to which meaning is, or might be, assigned.

data base. A set of data, consisting of at least one file, that is sufficient for a given purpose or for a given data processing system.

data control block. A control block used by access routines in storing and retrieving data.

data set. The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

drive, magnetic tape. (ISO) A mechanism for moving magnetic tape and controlling its movement.

dump. (ISO) To write the contents of storage, or of a part of storage, usually from an internal storage to a external medium, for a specific purpose such as to allow other use of storage, as a safeguard against faults or errors, or in connection with debugging.

file. (ANSI)(ISO) A set of related records, treated as a unit, for example, in stock control, a file could consist of a set of invoices.

format. (ANSI)(ISO) The arrangement or layout of data on a data medium.

host system. A data processing system that is used to prepare programs and the operating environments for use on another computer or controller.

interchange application. The preparation of tapes for use on other systems or devices, either local or remote, or the use of tape data prepared by another system.

JCL (job control language). (ANSI) A problem-oriented language designed to express statements in a job that are used to identify the job or describe its requirements to an operating system.

journaling. Recording transactions against a data set so that the data set can be reconstructed by applying transactions in the journal against a previous version of the data set.

loader. See "automatic cartridge loader".

manual mode. A mode of operation that can be selected on the Automatic Cartridge Loader feature. This mode allows a single tape cartridge feed, performed by the operator.

magnetic recording. (ANSI) A technique of storing data by selectively magnetizing portions of a magnetizable material.

magnetic tape. (ISO) A tape with a magnetizable surface layer on which data can be stored by magnetic recording.

media capacity. The amount of data that can be contained on a storage medium and expressed in bytes of data.

multiplexer channel. A channel designed to operate with a number of I/O devices simultaneously.

processing application. The execution of a systematic sequence of operations performed on data to accomplish a specific purpose.

record. (ANSI)(ISO) A collection of related data or words, treated as a unit; for example, in stock control, each invoice could constitute one record.

recording density. (ANSI) The number of bits in a single linear track measured per unit of length of the recording medium.

special feature. A specific design addition to an IBM product, quoted in the IBM Sales Manual and separately orderable.

standard feature. The significant design elements of an IBM product that are included as part of the basic, standard

system mode. A mode of operation that can be selected on the Automatic Cartridge Loader feature. This mode allows the

automatic feeding and loading of premounted blank or scratch tape cartridges in response to non-specific volume requests, while specific volume requests require operator insertion of the requested tape cartridge.

tape cartridge. A container holding magnetic tape that can be processed without separating it from the container.

volume. (ISO) A certain portion of data, together with its data carrier, that can be handled conveniently as a unit.

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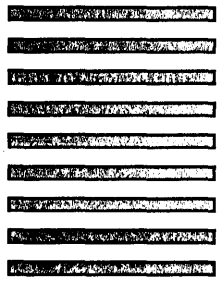

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