

**IBM System/3
3741
Reference Manual**

**3741 Data Station Models 1 and 2
3741 Programmable Work Station
Models 3 and 4**

GC21-5113-2
File No. S3-08

Preface

This manual is intended primarily for data processing personnel who are planning installation of an IBM 3741 Data Station or 3741 Programmable Work Station directly attached to a System/3 Model 6, 8, 10, 12, or 15, and for key station operators who use a 3741 directly attached to a System/3 Model 6, 8, 10, 12, or 15.

The purpose of this manual is to describe the operation and use of a 3741 that is directly attached to a System/3. (The 3741 has an input/output adapter and the System/3 has a 3741 attachment feature.) The reader should be

familiar with System/3 and 3741 operations. (See the *IBM Data Station Operator's Guide*, GA21-9131.) Refer as required to one of the following reference manuals:

- *IBM 3741 Data Station Reference Manual*, GA21-9183.
- *IBM 3741 Models 3 and 4 Programmable Work Station Programming Reference Manual*, GA21-9194.

See *Appendix A* for a bibliography of related publications.

Third Edition (September 1978)

This publication is a major revision of, and obsoletes, GC21-5113-1 and technical newsletters GN21-5419 and GN21-5556. Changes to text and illustrations are indicated by a vertical line to the left of the change or addition.

This edition applies to the following IBM System/3 system control programs and to all subsequent versions and modifications until otherwise indicated in new editions or technical newsletters.

Version	Modification	Program Number	System/3 Model
15	00	5702-SC1	Model 10 Disk and Model 8
15	00	5703-SC1	Model 6
06	00	5704-SC1	Model 15A-B-C
03	00	5704-SC2	Model 15D
04	00	5705-SC1	Model 12

Changes are periodically made to the information herein; before using this publication in connection with the operation of IBM systems, refer to the latest *IBM System/3 Bibliography*, GC20-8080, for the editions that are applicable and current.

This publication contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Use this publication only for the purposes stated in the *Preface*.

Publications are not stocked at the address below. Requests for copies of IBM publications and for technical information about the system should be made to your IBM representative or to the branch office serving your locality.

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List of Abbreviations

ACL	Application control language
BOE	Beginning of extent
BSCA	Binary synchronous communications adapter
BSCC	Binary synchronous communications controller
CCP	Communications control program
CPU	Processing unit
DFF	Display format facility
DPF	Dual program feature
EOD	End of data
EOE	End of extent
EOJ	End of job
I/O	Input/output
ICA	Integrated communications adapter
IPL	Initial program load
LCA	Local communications adapter
MFCM	Multi-function card machine
MFCU	Multi-function card unit
MRJE	MULTI-LEAVING remote job entry
MVI	Multivolume indicator
OCC	Operator control command
OCL	Operation control language
PP	Program product
RDRQ	Reader queue
RJE	Remote job entry
SCP	System control programming
VTOC	Volume table of contents

How To Use This Manual

This publication is designed to be used in any one of several ways, depending upon your needs:

As an Overview

Chapter 1. Introduction: Provides an overview of the online functions and characteristics of the 3741 directly attached to a System/3 Model 6, 8, 10, 12, or 15.

Chapter 2. 3741 Operation: Explains the operation of the 3741 both as an online device directly attached to a System/3 and as an offline device.

As a Reference Summary

Chapter 3. Programming Facilities: Describes System/3 system control programming and program products in relation to the 3741. It provides a reference summary of the facilities provided by particular programs, such as RPG II.

As an Operator's Guide

Chapter 4. Modes of Operation: Contains information relevant to the individual modes. This chapter is divided into separate sections for each read and write mode. This allows you to remove a particular section and keep it at the 3741 for quick reference in performing day-to-day activities.

Chapter 5. Error Conditions: Explains the possible error conditions and recovery actions. You may find it convenient to remove this chapter and place it near the 3741.

As a Planning Guide

Chapter 6. Examples: Provides examples that can serve as aids in planning your programs.

Appendixes included are:

Appendix A. Bibliography

Appendix B. Layout of Diskette

Appendix C. Valid 3741 Characters

Appendix D. 3741 Status Line

The four models of the 3741 are the 3741 Data Station Models 1 and 2 and the 3741 Programmable Work Station Models 3 and 4 (Figure 1). Models can be used:

- As online I/O (input/output) devices directly attached to System/3.
- As offline data entry devices.
- As terminal devices in a communications environment (Model 2 or 4 only).

This manual describes the online functions and characteristics of the 3741 directly attached to a System/3 Model 6, System/3 Model 8, System/3 Model 10, System/3 Model 12, or System/3 Model 15. When the 3741 is directly attached to a System/3, the 3741 requires an I/O adapter and the System/3 requires a 3741 attachment feature.

Note: In this manual, *online* means that the 3741 is being used as an I/O device directly attached to a System/3; *offline* means that the 3741 is being used independently of the System/3. Also, a directly attached 3741 Model 2 or 4 can perform offline operations with another 3741 Model 2 or 4.

Any reference to the 3741 used as a terminal device is clearly specified; otherwise any reference in this manual to the 3741 is a reference to a 3741 used as an online I/O device directly attached to a System/3.

Also, any reference to Model 10 always means System/3 Model 10 Disk System.

DESCRIPTION OF THE MODELS AND RECORDING MEDIA

For a description of the functions performed by the individual models of the 3741, refer to the *IBM 3741 Data Station Reference Manual*, GA21-9183 or to the *IBM 3741 Models 3 and 4 Programmable Work Station Programming Reference Manual*, GA21-9194.

The IBM 3741 Data Station Model 1 is a single operator, key entry station with one or two diskette drives. Model 2 performs the Model 1 functions and has a BSCA (binary synchronous communications adapter) so that it can function as a remote terminal in a telecommunications environment.

The IBM 3741 Programmable Work Station Model 3 performs the Model 1 functions and, in addition, can operate under control of application programs written in ACL (application control language). Model 4 performs the Model 2 functions and can use ACL.

Only one 3741 can be directly attached to a System/3. When this 3741 is operating online to System/3, only Model 1 functions are supported.

The 3741 uses a magnetic recording medium called the IBM Diskette (Figure 2).

If your System/3 has a directly attached 3741, you can also use card I/O devices (except for the Model 8 which does not have card I/O). The arrangement of records on a diskette parallels the arrangement of punched card records. Also, operations parallel those of a card-oriented system.

In this manual, *input* to System/3 is called a read operation from the diskette; *output* from System/3 is called a write operation to the diskette (rather than punch to cards).

In the publications for the 3740 system, the term *read*, or *input*, refers to reading from the I/O channel on the 3741 (a System/3 write operation), and the term *write*, or *output*, refers to writing to the I/O channel on the 3741 (a System/3 read operation).

SYSTEM REQUIREMENTS

For information concerning the minimum system configuration required to use the directly attached 3741 and additional devices supported by the system control program, see one of the following publications, as appropriate for your IBM System/3 model:

- *IBM System/3 Models 4, 6, 8, 10, and 12 System Generation Reference Manual*, GC21-5126
- *IBM System/3 Model 15 System Generation Reference Manual*, GC21-7616
- *IBM System/3 Model 8 Introduction*, GC21-5114
- *IBM System/3 Model 12 Introduction*, GC21-5116
- *IBM System/3 Model 15 Introduction*, GC21-5094

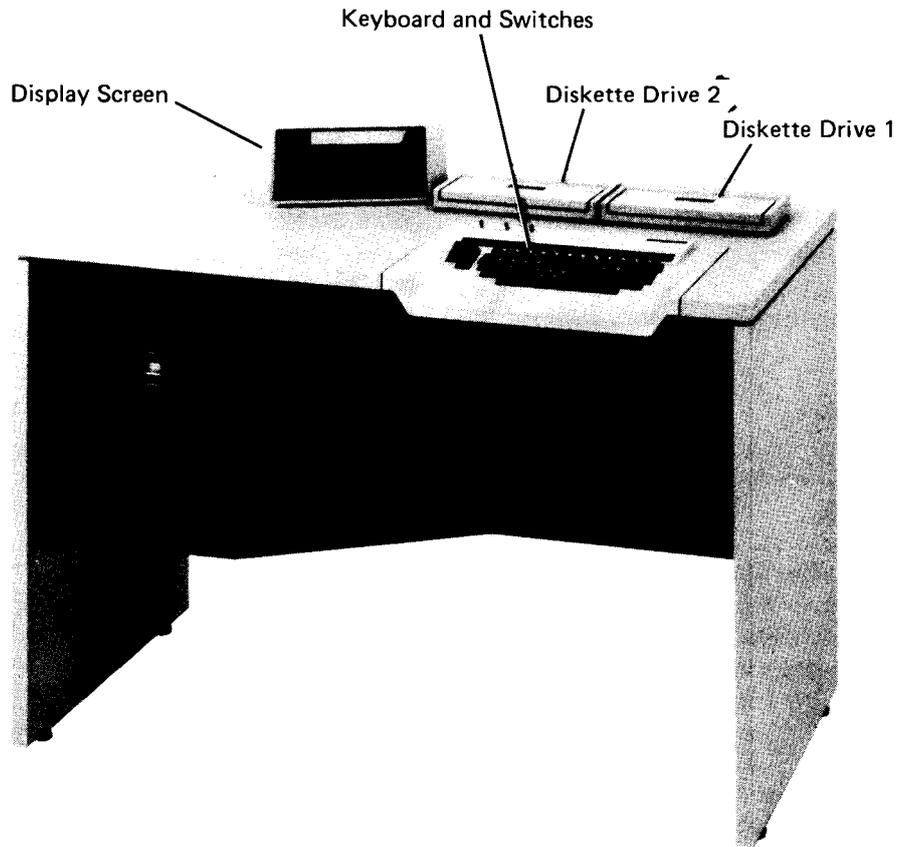


Figure 1. IBM 3741 Data Station or Programmable Work Station

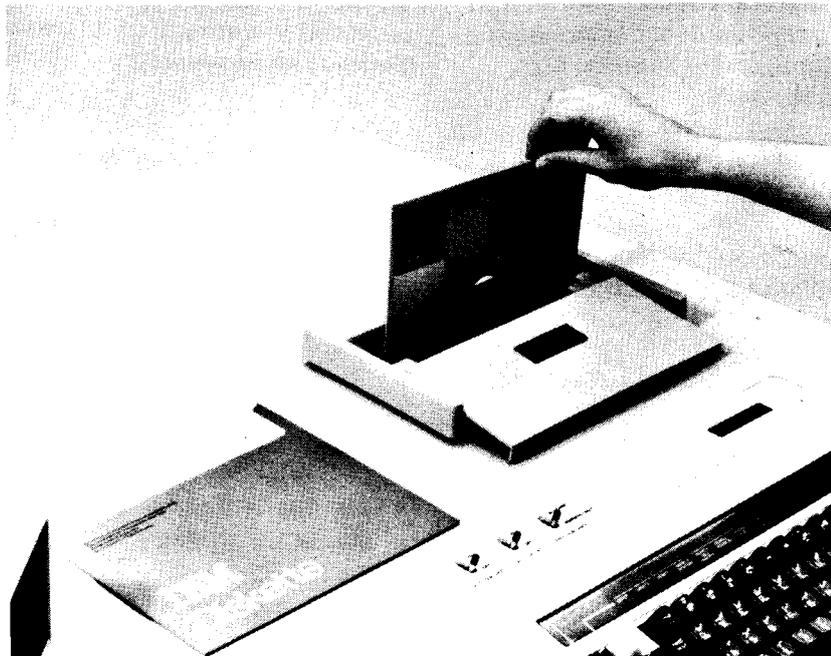


Figure 2. Inserting an IBM Diskette

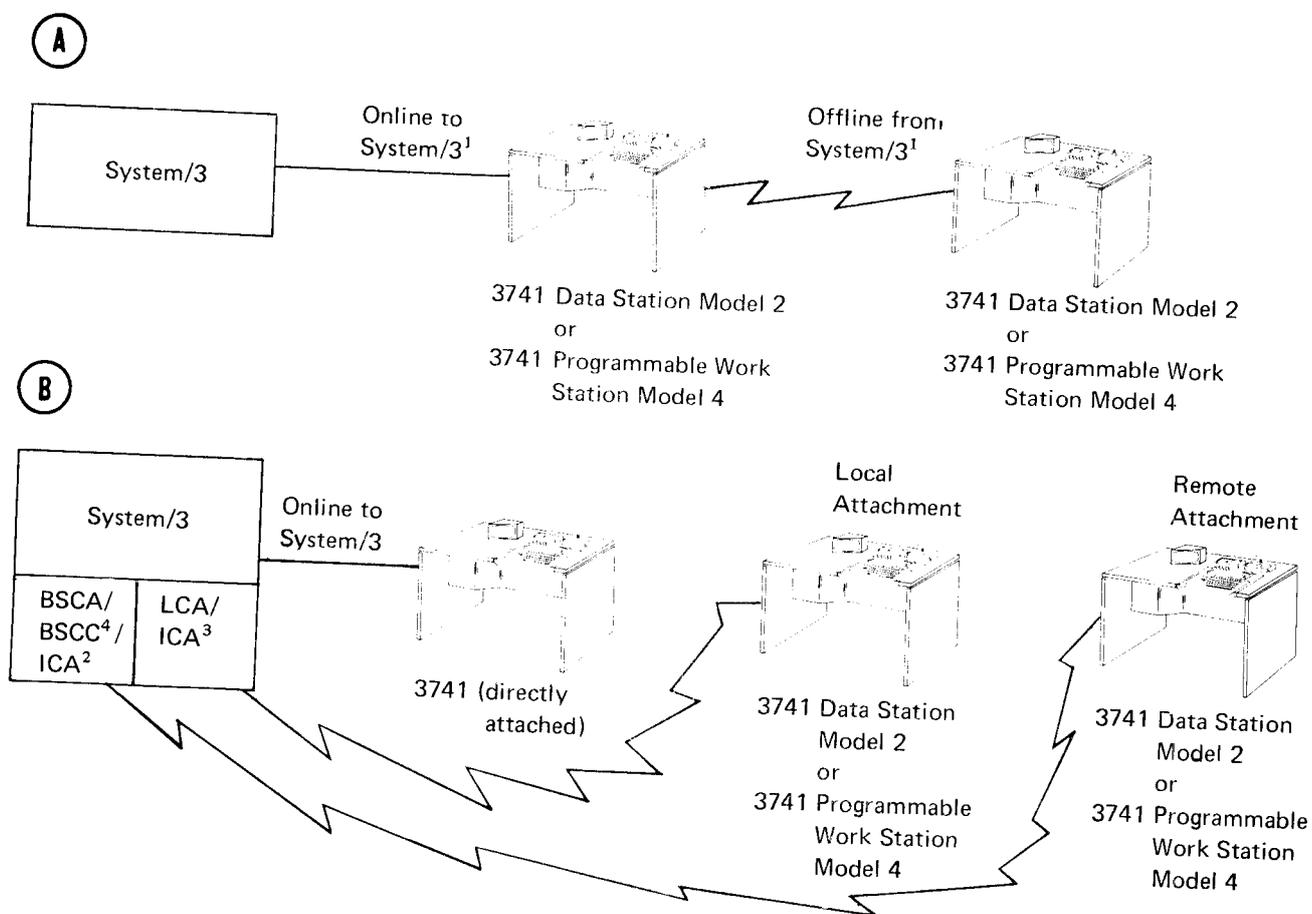
USE OF THE 3741 ONLINE AND OFFLINE

Communications Configurations

For local use as a terminal (Figure 3, Part B), the 3741 is attached to System/3 via LCA (local communications adapter) or ICA (integrated communications adapter). For remote use as a terminal, the 3741 is attached to System/3 via a BSCA or ICA. When the 3741 is using any of these

communications adapters, data records are transferred between the 3741 and System/3 by means of communications programming.

When the 3741 is directly attached to System/3 via the 3741 attachment feature (Figure 3, Parts A or B), it can be used for system input and output as well as for data input and output. (No communications programming is used.)



Notes:

1. The directly attached 3741 can operate either online with System/3 or with other 3741s while offline to System/3; it cannot do both at the same time.
2. BSCA can be used with any System/3 model.
ICA can be used with IBM System/3 Model 8 or 12.
3. LCA can be used with IBM System/3 Model 6, 10, or 15.
ICA can be used with IBM System/3 Model 8 or 12.
4. BSCC can be used with IBM System/3 Model 15D.

Figure 3. Communications Configurations

3741 Operations

The directly attached 3741 should be powered on prior to performing an initial program load (IPL) on the System/3 and powered off after the System/3 is powered off. If it becomes necessary to power the 3741 on or off while a program is running in the System/3, press STOP on the processing unit, power the 3741 on or off, then press START on the processing unit.

If the 3741 has been online to the System/3, the key entry programs must be reloaded if the 3741 is to be used as a key entry device.

The 3741 keyboard is enabled for offline operations so that you can enter or change data on diskettes.

To transfer data to or from the System/3, place the 3741 online in a read or write mode. (See *Chapter 4. Modes of Operation.*) The five read and write modes offer a means of transferring data rapidly between the 3741 and System/3.

Backup files and files that are used only occasionally can be stored compactly on diskettes.

All models of the 3741 can operate offline. Models 3 and 4 can use ACL only when offline. When online to System/3, the 3741 Model 2, 3, or 4 operates the same as a Model 1. *Chapter 2* includes a brief description of offline operations; for more complete information, see either the *IBM 3741 Data Station Reference Manual*, GA21-9183, or the *IBM 3741 Models 3 and 4 Programmable Work Station Programming Reference Manual*, GA21-9194.

PROGRAMMING FACILITIES

System/3 programming for the directly attached 3741 is similar to that for a card reader or card punch. Figure 4 lists some of the programming functions that are available. A specific record length of 96 is required when the 3741 is used as the system input or output device; for all other functions, the record length can be from 1 through 128.

Function	System/3 Model:					
	6	8	10	12	15ABC	15D
System input or output device	X	X	X	X	X	X
Spooling input (see <i>Spooling</i>)					X	X
Data management	X	X	X	X	X	X
Device-independent data management					X	X
Disk Sort input					X	X
RPG II input or output	X	X	X	X	X	X
COBOL						X
FORTTRAN						X

Figure 4. 3741 Programming Functions

The system input device, called the system reader, or simply READER, reads such things as OCL (operation control language) and utility control statements for the system. The system output device, called the system punch, or simply PUNCH, writes or punches output such as object programs.

Data management and device independent data management routines are included in user programs, such as RPG II object programs, to read data from the 3741 or write data to the 3741. Records processed by data management are fixed length and unblocked. A file consists of one or more data sets on one or more diskettes.

When the 3741 is online, System/3 can read from or write to the 3741, but cannot do both at the same time. Only one file on 3741 diskettes can be used at one time. For example, although System/3 can assign the 3741 to be both the READER and the PUNCH, the 3741 cannot be used as both simultaneously. The operator can, however, stop the processing and change modes (read or write), then continue processing. Also, an RPG II program can have only one file description specification that defines a diskette file.

An SCP (system control programming) utility program copies records to and from the 3741.

PERFORMANCE CONSIDERATIONS

System/3 can read approximately 1500 records per minute from the 3741 and can write approximately 1000 records per minute to the 3741 when:

- Records are transferred between the 3741 and a disk device (5444, 5445, 3340 or 3344).
- 128-byte records are used on the diskette and double buffering is specified in the System/3 program.
- Block size on the disk device is 1024 bytes (eight records per block) and double buffering is specified in the System/3 program.
- The system is dedicated (without dual programming, multiprogramming, or spooling).
- The operation is error-free with no alternate tracks assigned on the System/3 disk.
- The diskette is error-free and normal sector sequencing is used.

The stated performance rates may not be achieved if these conditions vary.

You should also be aware that, for I/O bound jobs, a System/3 program cannot run faster than the slowest I/O device. For example, if records are printed while being read from the 3741, throughput speed is about that of the System/3 printer.

SYSTEM REQUIREMENTS

To use the 3741 directly attached to System/3, you need (as a minimum) the directly attached 3741 and the following.

The Model 6 requires a 12K processing unit, a 5444 Disk Storage Drive, and a printer. Note that the system cannot have both a 3741 attachment feature and a serial I/O channel. Programming requirements are the System Control Program (5703-SC1) and the 3741 Data Station Feature.

The Model 8 requires a 16K processing unit, a 5444 Disk Storage Drive, and a printer. Programming requirements are the System Control Program (5702-SC1) and the 3741 Data Station Feature.

The Model 10 requires a 12K processing unit, a 5444 Disk Storage Drive, a printer, and a card input/output device. Programming requirements are the System Control Program (5702-SC1) and the 3741 Data Station Feature.

The Model 12 requires a 32K processing unit, a 3340 Direct Access Storage Facility Model C2, and a printer. Programming required is the System Control Program (5705-SC1), which includes support for the 3741.

The Model 15A requires a 48K processing unit, a 5444 Disk Storage Drive, a 3277 Display Station, and a printer. The System Control Program (5704-SC1) includes support for the 3741.

The Model 15B requires a 48K processing unit, a 3340 Direct Access Storage Facility, a 3277 Display Station, a printer, and an input/output device. The System Control Program (5704-SC1) includes support for the 3741.

The Model 15C requires a 160K processing unit, a 3340 Direct Access Storage Facility, a 3277 Display Station, a printer, and an input/output device. The System Control Program (5704-SC1) includes support for the 3741.

The Model 15D requires a 96K processing unit, a 3340 Direct Access Storage Facility, a 3277 Display Station, a printer, and an input/output device. The System Control Program (5704-SC2) includes support for the 3741.

Notes:

1. If card I/O devices are available, they and a directly attached 3741 can be used with System/3.
2. A 3741 cannot have both an I/O adapter and a data recorder attachment.

Chapter 2. 3741 Operation

The 3741 is a single operator, key entry station that has a keyboard (Figure 5), one or two diskette drives, a control unit, a power supply, and a six-line display screen.

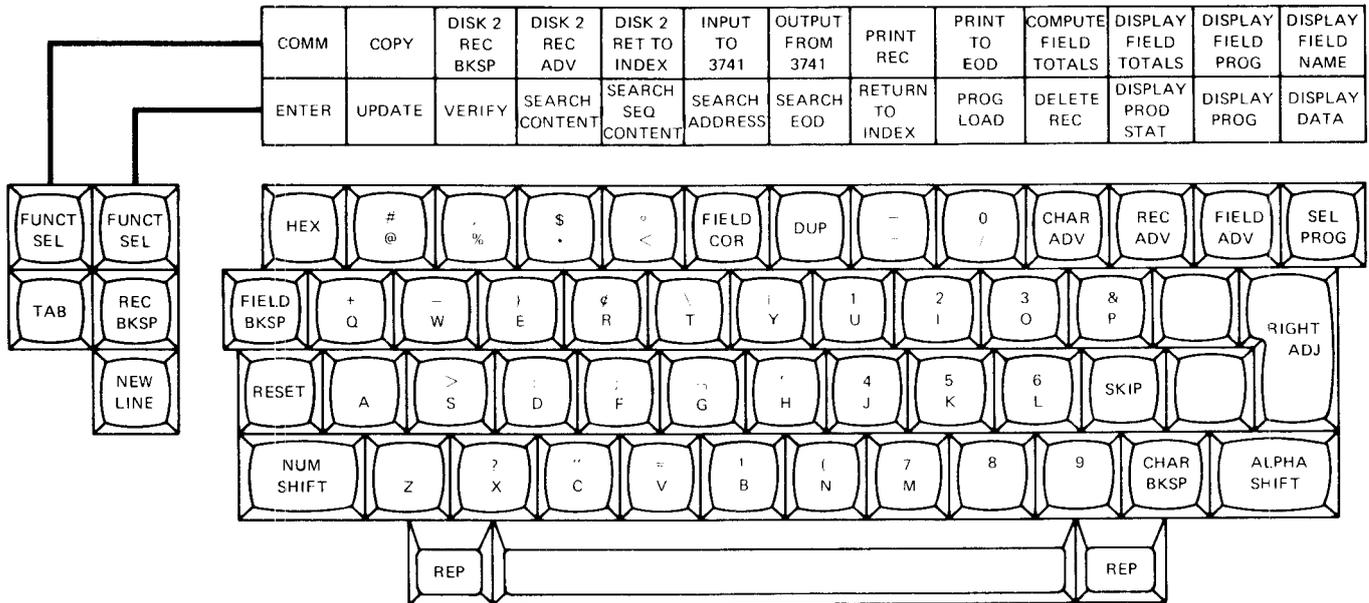


Figure 5. 3741 Keyboard

FEATURES

A Summary of Standard and Optional Features

Standard and optional features of the 3741 are listed in Figure 6. More complete information about these features is contained in the *IBM 3740 Data Entry System – System Summary and Installation Manual—Physical Planning*, GA21-9152; the *IBM 3741 Data Station Reference Manual*, GA21-9183; and the *IBM 3741 Models 3 and 4 Programmable Work Station Programming Reference Manual*, GA21-9194. When online to System/3, only the I/O adapter and the Second Disk Feature can be used; when the 3741 is offline, the other features can be used.

Function or Feature	3741, All Models (Note 1)	Function or Feature	3741, All Models (Note 1)
Entering data	Standard	Proof keyboard	Optional
Updating data	Standard	Input/output adapter (Notes 2 and 3)	Optional
Operator guidance	Standard	Application control language	Standard on Models 3 and 4 for offline use (not available on Models 1 and 2)
Program control:		Data recorder attachment feature (Note 3)	Optional
Program chaining	Standard	Printers:	
Ten levels of program control	Standard	3713 Printer, 3715 Printer, or 3717 Printer	Optional
Verifying data	Optional	Binary synchronous communications adapter	Standard on Models 2 and 4 (not available on Models 1 and 3)
Record insert	Optional	Synchronous clock	
Searching data on the disk:		Terminal identification	Optional on Models 2 and 4
Search on record address	Standard	Keylock	
Search on end of data	Standard	Operator identification card reader	
Search on content and sequential content	Standard	Expanded communications	
Disk copy	Optional	Expanded communications/multipoint data link control	
Second disk (Note 2)	Optional		
Record length	Standard (1-128)		
Disk initialization	Optional		
Production statistics	Optional		
Field totals:			
Offline field totals	Optional		
Online field totals	Optional		
Self-check	Optional		

Notes:

1. Functions and features in this summary apply to the 3741 Programmable Work Station Models 3 and 4 only when they are not under ACL program control.
2. Supported when the 3741 is directly attached to System/3.
3. The input/output adapter and data recorder attachment features are mutually exclusive.

Figure 6. Standard and Optional Functions and Features

Second Disk Feature

The addition of a second diskette drive provides dual disk capability on the 3741. The second diskette drive is to the left of the first diskette drive (Figure 1).

When the 3741 has a second diskette drive, you can perform the following offline functions:

- Duplicate a diskette for backup or save data from a defective diskette.
- Merge records from a diskette on the second drive and records from the keyboard onto the diskette on the first diskette drive.
- Pool data from several diskettes onto one diskette.
- Extend program storage; programs can be loaded into the program storage buffers from the second diskette without removing the diskette on drive 1.
- Expand storage for use with the communications feature.

When the 3741 is online to System/3, you cannot address the second diskette drive. Depending on the mode you select when the 3741 is placed online, processing automatically switches from drive 1 to drive 2, and then from drive 2 to drive 1. You can change the diskette on one drive while processing is continuing on the other drive. Processing always starts on drive 1; processing also always resumes on drive 1 after an error condition requiring 3741 operator intervention.

Note: Automatic processing on first one drive, then the other, occurs only if you open and close the cover of each drive after it is used; this action prevents a diskette from accidentally being processed again.

3741 OFFLINE OPERATIONS

You can use the 3741 offline to enter data, update records, add records, and search for data.

Entering Data

Enter original records by keying while in enter mode. The system places keyed characters in a buffer as they appear on the 3741 display screen. When you have entered a complete record, press REC ADV to transfer the record to the diskette and clear the display screen. If AUTO REC ADV is on, the 3741 releases the record automatically when the last character is keyed.

Updating Records

Select update mode to change a previously keyed record. After you enter a partial or complete data set, you can review each record and modify any record by selecting update mode. You can step through the records by pressing REC ADV or REC BKSP. You can use update mode to change any field in a record.

Adding Records

The best way to add one or more records to an existing data set is to add them at the end of a batch after you verify the rest of the batch.

To add missing records between records previously entered:

- Add the records at the end of the batch and sort them on the System/3 prior to processing.
- Use a machine equipped with disk copy to copy the data up to the appropriate address; then insert the missing record and copy the rest of the data.
- Insert the records within the data set by using the record insert feature.

Searching for Data on the Diskette

In search mode, you can:

- Search on record address. You can find a particular record by specifying its address (track and sector number). The search stops at the specified address and the proper record is displayed.
- Search on EOD (end of data). The last record in a data set is found. This operation allows you to add additional records to a data set without either knowing where the end of the data set is or having to search for the end of the data set manually.
- Search on content and sequential content. You can locate a record by specifying a mask statement identifying the record contents. Search sequential content is a fast search method that you can use for records having sequentially arranged fields. In either type of search, if the record is not found, an error is displayed.

3741 DISPLAY SCREEN

The display screen:

- Provides quick communication of errors to an operator.
- Facilitates scanning and searching of stored records.
- Permits source keying with operator guidance.

The display contains a 40-character status line and displays the data record as it is keyed or when it is reviewed. The cursor, shown on the left side of the display screen in Figure 8, moves as you key entries, indicating the next position to be keyed.

Line 1 — Status Line

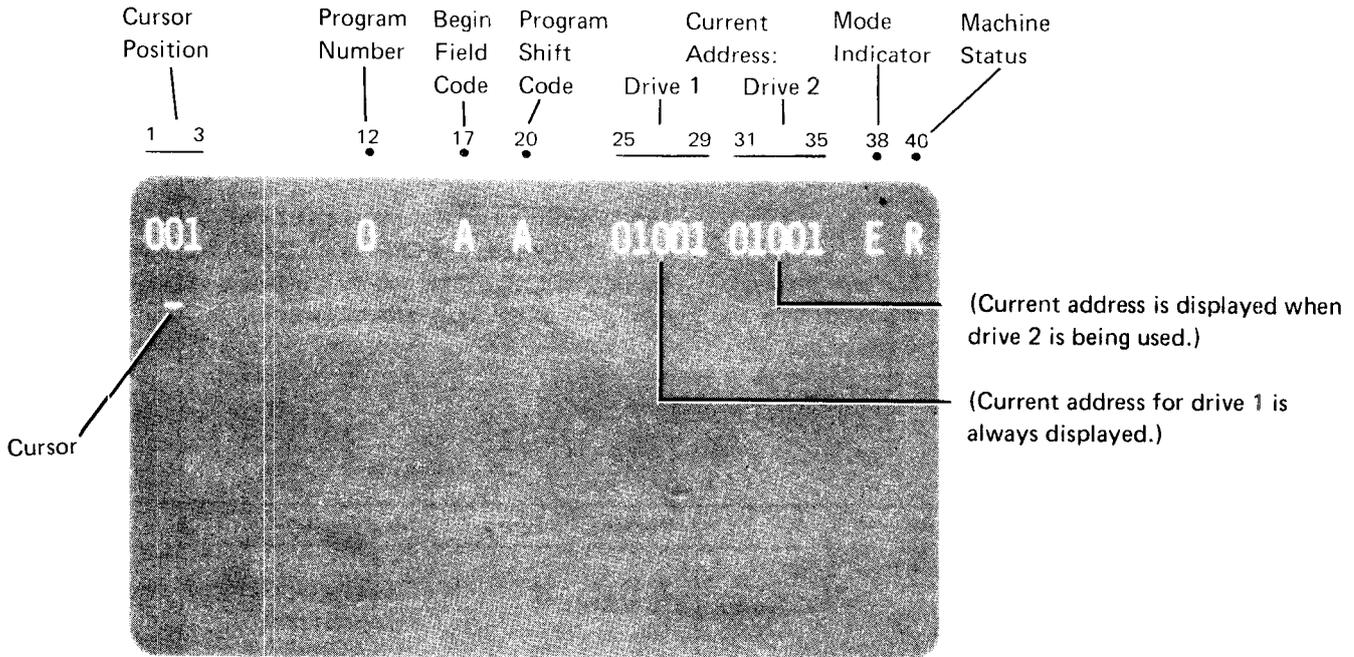
When you insert a diskette and close the diskette drive cover, the status line and first data set label are displayed. For an explanation of status line entries during offline operations, see the *IBM 3741 Data Station Operator's Guide*, GA21-9131.

Not all positions on the online status line have a displayed entry at all times. See *Chapter 5. Error Conditions* for a list of displayed entries and their meaning. Figure 7 contains a list of the most common entries.

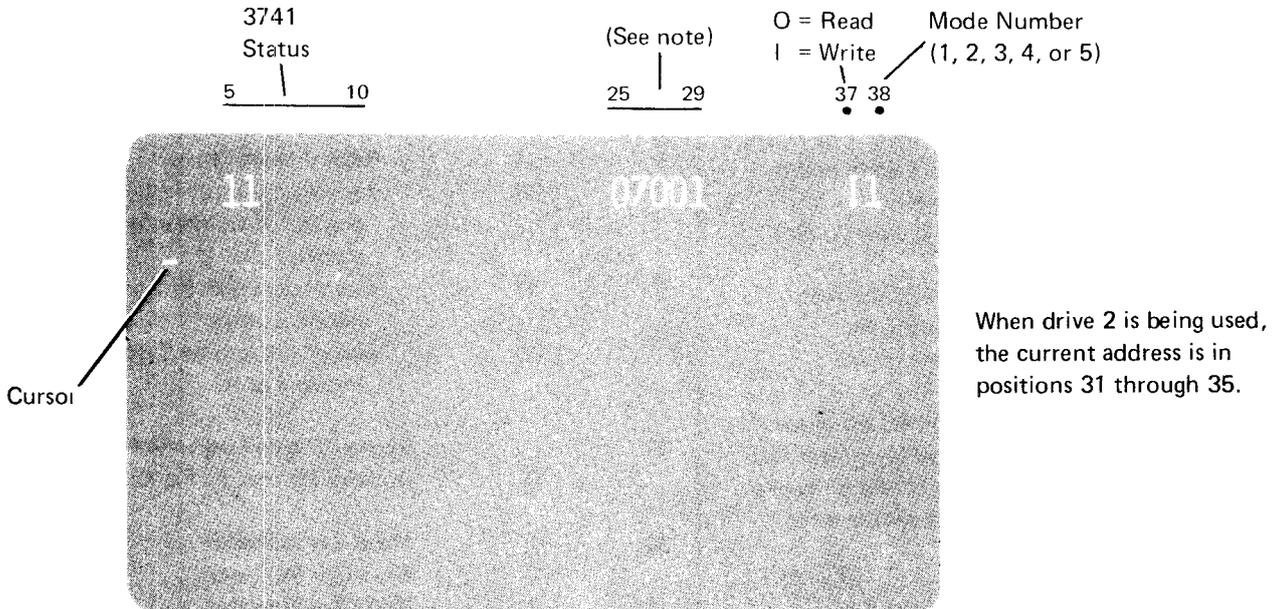
Position	Entry	Meaning	Position	Entry	Meaning
5	0	The 3741 is disconnected from the System/3.	7	0	Early disk removal during file operations.
	1	The 3741 is online.		1	Length error.
6	0	No commands are active.		2	No record found.
	1	The 3741 is ready to perform a read or write for System/3.		3	Seek error.
		The 3741 is waiting for a response from the processing unit:		4	Read error.
	2	Service request response.		5	Write error.
	3	End of record active.	X	Overlap extent error.	
	4	End of data set out is active.	8	1	Diskette error is on drive 1.
	5	End of file is reached. (The last record is read in mode 1 or FUNCT SEL upper, then T is pressed in mode 2, 3, 4, or 5.)		2	Diskette error is on drive 2.
	6	3741 attention is required. (See position 7.)	9, 10		I/O adapter error code is:
A	Mode (read/write) is incorrect.	84		Record length error.	
B	Record length is incorrect.	86		Attachment error (usually indicated when in the wrong mode).	
C	Record length is incorrect.	87		End of data sent by System/3 (mode 4 only).	
	<i>Note:</i> 6A, 6B, and 6C are sense responses. System/3 has informed the 3741 that the condition exists and the 3741 displays the error indication.	88	End of file sent by System/3 (mode 4 only).		
7-8		Diskette error code is:	37	1	System/3 is writing to the diskette.
	00			0	System/3 is reading from the diskette.
			38	1	Mode 1 is indicated.
				2	Mode 2 is indicated.
				3	Mode 3 is indicated.
				4	Mode 4 is indicated.
				5	Mode 5 is indicated.

Figure 7. Status Line Entries

Status line when the 3741 is offline:



Status line when the 3741 is online:



Note: When there is an O in position 37, positions 25 through 29 contain the address of the next record to be transferred to System/3.

When there is an I in position 37, positions 25 through 29 contain the address of the first record in each 13-record block.

Figure 8. Status Line Displayed on Line 1 of 3741 Display Screen

Lines 2 through 6

If the diskette head is positioned at the index track, lines 2 and 3 contain the data set label. If the operation is beyond the index track, lines 2 through 5 contain keyed data. During record transfer, lines 2 through 5 contain the first of each block of 13 records. If there is a diskette error, lines 2 through 5 contain the error record and the image on the display screen blinks. The last 30 characters of lines 5 and 6 are used for operator guidance during offline operations.

DATA SET LABEL

Each track on a diskette contains 26 sectors. The first seven sectors of the index track (track 00) contain track and diskette identification information as described in *Appendix B*. Each data set label contains the location of a particular data set on the diskette. The label can also identify the data set by name. (Creation and checking of labels is an operator function. The System/3 does not process or create the labels.) Each data set label requires one of the sectors between 8 and 26 on the index track and contains:

Field	For 3741 Directly Attached to System/3
Label identifier (HDR1)	Required.
Data set name	Optional. (See Note 1.)
Block/record length	Required.
Beginning of extent (BOE) (See Note 2.)	Required.
End of extent (EOE) (See Note 2.)	Required.
Bypass indicator	Required (blank or B).
Data set security	Optional.
Write protect	Required (blank or P).
Interchange type indicator	Must be blank.

Field	For 3741 Directly Attached to System/3
Multivolume indicator	Required (blank, C, or L).
Volume sequence number	Not applicable.
Creation date	Not applicable.
Expiration date	Not applicable.
Verify mark	Not applicable.
EOD (See Note 2.)	Required.

Notes:

1. The optional or not applicable fields are not required for online use, but can be used in offline applications on a 3747 or 3540.
2. BOE, EOD, and EOE are diskette addresses in the format TT0SS where TT is a track number (1 through 73) and SS is a sector number (1 through 26).

Bypass Indicator (Position 41)

A blank (b) in position 41 indicates that you can process the data set. A B entry indicates that you cannot process the data set, even though it resides on the diskette. However, if you position the diskette head at a record within a data set before you place the 3741 online, the program does not bypass the data set. Those subsequent data sets with a bypass indicator of B are bypassed if the mode being used is 3, 4, or 5. A B1 error is posted in positions 7 and 8 of the status line if you attempt to process a bypass data set while in mode 1 or 2.

Write Protect (Position 43)

P in position 43 indicates that the data set can be read only. This field must contain a blank to allow both read and write operations.

Check for Overlapping Extents (Reading or Writing)

Each time the diskette head returns to the index track to locate another data set label, the 3741 checks for overlapping extents. If the next data set label defines a data set that has a BOE or EOE address that is within another set, the 3741 posts an error and displays the data set label that overlaps the one you are trying to process.

If you position the diskette head to a record within a data set before placing the 3741 online, there is no overlapping extents check for that data set. Checks for overlapping extents are made for subsequent data sets if you are using mode 2, 3, 4, or 5. All labels are checked, even if they are coded as bypass, secure, or write protect. (See *Appendix B*, index track, sector 08, position 42, for data set security entry.) If any data set on a diskette is secure, a 10A1 or 10A2 error occurs if you try to place any other data set on the diskette online when positioned at the label. You can, however, place a nonsecure data set online by positioning within the nonsecure data set and then placing the 3741 online.

Multivolume Indicator (Position 45)

A blank in position 45 indicates that the entire data set is contained on this diskette. For the meaning of C and L entries in this field, see the appropriate mode (1 through 5) description in *Chapter 4*.

Record Length (Positions 25 through 27)

You must set up the record length field before placing the 3741 online for either a read or a write operation. The specified record length can be from 1 to 128, but must be the same as the record length specified in the System/3 program (Figure 4). The record length specified in the label applies to all records in the data set.

A single diskette can hold multiple data sets, but for easy management of the work flow, keying only one data set on each diskette is recommended. If multiple data sets are combined into a single file, all data sets must have the same record length. A data set can extend to more than one diskette. The descriptions of modes 1 through 5 explain where and how specially designed procedures apply when processing multiple data sets on one or more diskettes on one or both diskette drives.

DATA RECOVERY

If you write over data that is not yet processed, you must recreate the data from source or backup material. To recover a partially destroyed data set, you must reestablish the EOD address. The appropriate 3741 reference manual and operator's guide (see *Appendix A. Bibliography*) contain the operating procedures for recovery of EOD address for overwritten records.

Although diskettes rarely develop irregularities because of continued use, some irregularity can occur if foreign material contaminates the diskette. Each installation should have a standard procedure to follow when a data record cannot be read or written onto a diskette. If the station has the copy function, the best data recovery procedure is to copy the undamaged data onto a new diskette and key in the affected records. Alternate methods depend on the mode of operation the station is in at the time the diskette error is encountered. (See the *IBM 3741 Data Station Operator's Guide*, GA21-9131.)

You should make a note of diskette irregularities on the external label of the diskette. Consider the following before replacing a diskette:

1. If the error is on one of the first few tracks, you can easily modify the data index track to skip the bad track and all tracks that precede it and simply start recording further into the diskette.
2. A full 1898-record capacity may not be required. Diskettes need not be discarded when batches contain only 300 to 500 records.

3741 OPERATOR DUTIES

1. **Ready the diskette and the 3741.**
 - a. Select the correct diskette. Carefully identify each data set on the external label of the diskette so that you can find the correct diskette easily. This can save time that would otherwise be spent in a search for the desired data set label. (There can be up to 19 data sets on one diskette.)
 - b. Insert the diskette in the 3741 diskette drive 1 and close the cover; the first data set label is then displayed.
 - c. Search the index track to locate the desired data set label.
 - d. If necessary, modify the label.
 - e. Position the diskette to the first record that is to be read or to receive data. Note that if the diskette head is positioned at the label, processing begins with the record specified by the BOE address.
 - f. Select the desired mode and place the 3741 online.
2. Initiate the System/3 program that uses the data. If the program is already loaded, the System/3 may issue a device not-ready indication. This requires a response on the System/3.

Note: (5704-SC2 only) If unit record restart was selected during system generation, an automatic 1-option is provided.

3. Ensure that the diskettes are inserted in the proper sequence when processing multiple diskettes.

PLANNING DISKETTE CONTENTS AND PROGRAM SEQUENCE

You can use the diskette to store data, OCL statements, and utility control statements. For the storage of data, it is suggested that only one or two data sets be assigned and used per diskette; this technique can result in a simplified operation.

You may want to store all OCL and utility control statements on one diskette and all data on another. Generally, you do not need to change OCL once it is created, but you may need to change data frequently. You can use write protect to prevent accidental destruction of OCL data sets.

You must select a read mode or a write mode in order to place the 3741 online. When processing files using data management, the System/3 program can specify only an input or an output file, but not both. For data handled by READER or PUNCH functions, both input and output can be performed on the 3741, but operator intervention is required to change modes. It is important for you to consider this when compiling programs and running SCP utility programs.

When compiling, if your source programs are on diskette and you wish to punch the object programs on diskette, you must change from read to write mode for each program. Two possible alternatives are to:

- Compile all programs, putting the object programs in the object library on disk. When the compilations are complete, punch the object programs from the library to a diskette.
- Copy the source programs to a source library on disk and use a catalogued procedure to compile them. As the source programs are compiled, object programs can be written on the diskette without operator intervention.

When running the SCP utility programs, remember that some of them read control statements that request punching functions. Some of the utilities do not read all control statements before beginning to punch. (As each control statement is read, it is processed.) Therefore, when control statements are to be read and data is to be punched in the same run, it may be desirable to first catalog the OCL and control statements in the procedure library and then execute the procedure; punching to the diskette can then proceed without operator intervention. An example is:

```
// LOAD $MAINT,F1
// RUN
// COPY FROM-R1,LIBRARY-S,
//      NAME-PROGA,TO-PUNCH
// END
```

At the time punching is to begin, the // END statement is not read.

INITIATING AN OPERATION

To initiate an operation:

1. Select a data set or record.
2. Key a 4 in position 1.
3. Key a 1, 2, 3, 4, or 5 in position 2 (stands for the mode number). (Mode 4 requires an additional entry in positions 3 through 5.)
4. For a read operation, press FUNCT SEL upper, then DUP.
5. For a write operation, press FUNCT SEL upper, then FIELD COR.

SITE PLANNING

The 3741 should be situated so that you can readily see the 3741 display screen when you are at the System/3 console.

When the 3741 is operating online, the 3741 can require attention before the completion of the job and System/3 can appear to be in a busy loop when:

- EOD is reached while in mode 2 (read).
- A 10C1 or 10C2 continuation-required error is posted on the 3741.
- A 10E1 or 10E2 extent error is posted on the 3741.

In these instances, you must take appropriate action at the 3741 (no action required at System/3) to continue processing.

This chapter discusses System/3 SCP and program products in relation to the 3741.

SYSTEM CONTROL PROGRAM

This section describes SCP functions and programs. Figure 9 is a list of SCP functions and programs that are available for each of the models of System/3. The X opposite the name means only that the function or program is available for that model of System/3 and does not necessarily mean that it applies to the 3741. The individual descriptions in the text that follows explain to what extent, if any, each function or program can be used with the 3741.

Function	Program Number:						
	5703-SC1 Model Number: 6	5702-SC1 8	5702-SC1 10	5705-SC1 12	5704-SC1 15	5704-SC2 15	
Diskette records	X	X	X	X	X	X	
READER	X	X	X	X	X	X	
PUNCH	X	X	X	X	X	X	
Data management	X	X	X	X	X	X	
Device independent data management					X	X	
End of file	X	X	X	X	X	X	
Spooling (printer only on Model 12)				X	X	X	
Multiprogramming					X	X	
Dual programming		X	X	X			
Checkpoint/restart		X	X	X	X	X	
Rollout/rollin	X	X	X	X	X		
OCL (operation control language)	X	X	X	X	X	X	
OCC (operator control commands)					X	X	
IPL	X	X	X	X	X	X	
LOAD *	X	X	X	X	X	X	
Canceling a job		X	X	X	X	X	
Program							
CCP (communications control program)		X	X	X	X	X	
MRJE (MULTI-LEAVING remote job entry)	X	X	X	X	X	X	
RJE (remote job entry)	X	X	X				
Copy/dump program	X	X	X	X	X	X	
Library maintenance	X	X	X	X	X	X	
Macro processor		X	X	X	X	X	
Overlay linkage editor	X	X	X	X	X	X	
System generation	X	X	X	X	X	X	
Other utilities:							
Alternate track assignment	X	X	X	X	X	X	
Alternate track rebuild	X	X	X	X	X	X	
Dump/restore		X	X	X	X	X	
File delete	X	X	X	X	X	X	
System history area display					X	X	
Configuration record						X	
Disk initialization	X	X	X	X	X	X	
File and volume label display	X	X	X	X	X	X	
Disk pack backup/restore		X	X				
File compress				X	X	X	
3340 simulation area program				X	X	X	
Tape initialization		X	X	X	X	X	
Tape error summary		X	X	X	X	X	
5445 data interchange			X		X		
1000-file VTOC conversion program				X	X	X	
Reassign alternate track				X	X	X	
Recover index				X	X	X	

Figure 9. SCP Functions and Programs Available for Models of System/3

Functions

Diskette Records

Since the 3741 addresses records by sector and track, only one record is normally contained in a sector. Records do not span physical sector or track boundaries. If you have a record greater than the specified record length (1 through 128 bytes), your program must break the record into two or more segments of the specified length.

A data set can begin with any sector and end with any sector within a track.

Character Set

The data is stored in 8-bit bytes on the diskette. Any of the 256 EBCDIC characters can be read into the System/3 from a diskette or written onto a diskette by a System/3.

READER

You can specify the 3741 as the READER during system generation but you can also change this specification during processing by using:

- A READER prompt or READER statement for the Model 6.
- A READER OCL statement for Models 8, 10, and 12.
- A READER OCL statement or OCC for Model 15.

The READER is used to:

- Read OCL statements.
- Read control statements for SCP utility programs.
- Read source statements for the macro processor and program products.
- Read relocatable input for the overlay linkage editor.
- Read specifications for program products.
- Read object programs under control of the SCP by means of the // LOAD * statement; standalone object programs cannot be loaded from the 3741.
- Read input for the MODIFY function and the READER-to-library function of the library maintenance program (\$MAINT).

Figure 10 lists the devices that can be assigned as the READER. When you use the 3741, the records must be entered into a data set before placing the 3741 online. The diskette data set must have a record length of 96 bytes; only one statement can be read from each record on the diskette. The 3741 remains online until you reach EOD in mode 1 or until you take the 3741 offline in mode 1, 2, 3, 4, or 5. A specific statement in the input stream, such as // RUN or // END, determines end of file. An EOD does not cause an end-of-file condition. When the READER function is completed, the 3741 remains online.

Code	Description	Model				
		6	8	10	12	15
CONSOLE	3277 Display Station					
CONSOLE	5471 Printer-Keyboard					X
DATA96	129 Card Data Recorder		X	X	X	
DATA96	5496 Data Recorder	X				
KEY	Model 6 console keyboard	X				
MFCM1	2560 MFCM primary hopper					X
MFCM2	2560 MFCM secondary hopper					X
MFCU1	5424 MFCU primary hopper			X	X	X
MFCU2	5424 MFCU secondary hopper			X	X	X
1442	1442 Card Read Punch			X	X	X
2501	2501 Card Reader					X
3741	3741 Data Station	X	X	X	X	X
3741	3741 Programmable Work Station	X	X	X	X	X

Figure 10. READER Devices

PUNCH

A 3741 can be used as a PUNCH with System/3 Models 6, 8, 10, 12, and 15. (Model 15 does not use the 3741 as a spooled punch device.) You can specify the 3741 as the system punch device during system generation but you can also change this specification during processing by using a PUNCH OCL statement (or, if a Model 6, a PUNCH prompt.)

The PUNCH is used to:

- Provide optional output from the linkage editor or overlay linkage editor (used primarily with compilations).
- Provide output from the library-to-PUNCH function of the library maintenance program (\$MAINT).

Figure 11 lists the devices that can be assigned as the PUNCH. When you use the 3741, the diskette data set must have a specified record length of 96 bytes; only one record can be written into each sector on the diskette. The 3741 remains online until you release it when using the PUNCH. Several modules copied to the PUNCH in one run of \$MAINT are written consecutively into one data set with no intervention required between each module. If the 3741 is also the READER for the utility control statements, operator intervention is required.

Data Management

SCP contains data management routines for the 3741 that are included in user programs. Routines provided are:

Model 6 – Included in the 3741 Data Station Feature of the SCP (5703-SC1, feature 6026/6027).

Models 8 and 10 – Included in the 3741 Data Station Feature of the SCP (5702-SC1, feature 6066/6067).

Model 12 – Included in the SCP (5705-SC1).

Model 15 – Included in the SCP (5704-SC1).

The following programs or features use data management:

- Copy/dump
- Disk sort (Model 15; for input only)
- Macros (Models 8, 10, 12, and 15)
- RPG II object programs
- COBOL object programs (Model 15 5704-CB2 only)
- FORTRAN object programs (Model 15 5704-FO2 only)

Code	Description	Model				
		6	8	10	12	15
DATA96	129 Card Data Recorder	X				
DATA96	5496 Data Recorder	X				
MFCM1	2560 MFCM primary hopper					X
MFCM2	2560 MFCM secondary hopper					X
MFCU1	5424 MFCU primary hopper			X	X	X
MFCU2	5424 MFCU secondary hopper			X	X	X
1442	1442 Card Read Punch			X	X	X
3741	3741 Data Station	X	X	X	X	X
3741	3741 Programmable Work Station	X	X	X	X	X

Figure 11. PUNCH Devices

When data management is used with the 3741, the following considerations apply:

- Record length is from 1 to 128 bytes (3 to 128 when using input spooling) and the size of the I/O buffer is the record length specified.
- Each sector on the diskette normally contains only one logical record, although through programming techniques more than one logical record can be in one sector.
- All records in a file must have the same record length (fixed length records).
- Records are read from or written to the 3741 one at a time (unblocked), but optional double buffering in the System/3 program can improve performance.
- Records are read from or written to the diskette sequentially; indexed or direct organization cannot be used on the diskette.
- If, during program execution, the 3741 is taken offline with ALPHA SHIFT, NUM SHIFT, and RESET to correct input data and then put back online with the head positioned at the corrected data record, additional record(s) could be erroneously processed.
- If multiple programs attempt to read from the same data set, one or more records can be lost.
- Reading or writing can be done but not both in the same program.
- Only one file can be open at a time.

A file consists of one or more data sets on one or more diskettes. You determine the mode of processing when you place the 3741 online. It is your responsibility to check the data set labels on each diskette. When you use multiple data sets as one input file, the System/3 program does not know when one data set ends and another begins and, therefore, processes records as a single, uninterrupted input stream until it reaches end of file.

An end-of-file condition occurs for an input file when:

- A /* statement is read.
- A /& statement is read.
- A /. statement is read (Model 15 only).
- EOD is reached (mode 1 only).
- End of file is initiated by the operator (mode 2, 3, 4, or 5).

Device Independent Data Management

The copy/dump program (\$COPY) for the Model 15 uses device independent data management to access the 3741. RPG II object programs, or assembler programs using

macros, can access the 3741 using either 3741 data management or device independent data management.

With device independent data management, you assign the device for the file when the program is executed rather than when it is compiled. The level of support for the 3741 is otherwise identical to regular data management support.

End of File

When reading records from the 3741, System/3 receives an end-of-file indication from the 3741 in one of several ways depending on the function being used.

When using the 3741 as the READER, System/3 reads records until no more are required. For example, a // RUN or // END statement generally terminates the READER function for SCP utility programs. If the 3741 becomes not ready (for example, when reaching EOD before a // RUN or // END is read), System/3 issues a not-ready halt.

When files are processed by data management on Model 6, 8, 10, 12, or 15, or by device independent data management on Model 15, end of file is indicated as Figure 12 shows.

Example: The following is an end-of-file example:

1. Read OCL (no /*) from diskette A, data set 1, using mode 2.
2. Read data (no /*) from diskette B, data set 1, using mode 2.
3. Read data (no /*) from diskette C, data set 1, using mode 2.
4. Read /* (no data) from diskette C, data set 2, using mode 2.

This example shows three possible ways to use /* and mode selection alternatives:

- At the completion of step 3, you could have pressed FUNCT SEL upper, then T to cause an end-of-file condition.
- If the data set in step 3 contains a /* following the last data record, step 4 is not necessary.
- If you had selected mode 1 in step 3, neither step 4 nor a /* would be necessary; when you reach EOD using mode 1, the 3741 sends an end-of-file indication to System/3.

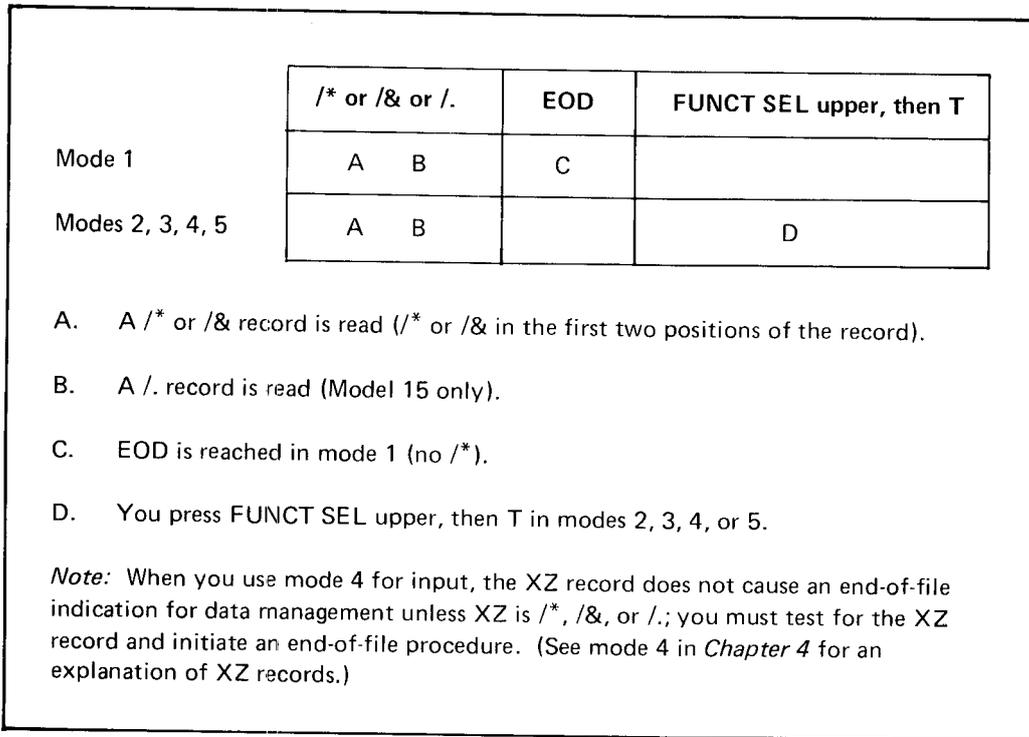


Figure 12. End of File on a Read with Data Management

Spooling (Model 15 Only)

You can use the 3741 as a spooled reader if the 3741 is directly attached to the Model 15. Model 15 spooling processes a job stream from the 3741 in the same way it processes a job stream from cards. Some considerations are:

- When 3741 input is being spooled, records can be 1-128 bytes. When these records are removed from the spool reader queue for processing, the following action will be taken by the system:
 - If the records to be processed are OCL or control statements, the spool routines pass 96-byte records to the OCL processor. Thus, if the records on the spool queue are greater than 96 bytes, only the first 96 bytes will be used. If the records are less than 96 bytes, the records will be padded on the right with blanks before being processed by the OCL processor.
 - If the records are to be processed by data management, the minimum record length is 3 bytes. (Programs that process records of less than 3 bytes must be executed with spool stopped.) In all other cases, records are padded with blanks or truncated by spool to the record length requested by the executing program.
- An incorrect record length message is not issued as the 3741 records are being placed on the reader queue.

- The 3741 cannot be used as a spooled punch device.
- A job is terminated with a /. statement. Two consecutive /. statements terminate the spooled reader and take the 3741 offline. Reaching EOD in mode 1 does not automatically terminate a spooled job stream.
- A /* indicates end of data. Detecting a 3741 EOD does not indicate end of data to spooling.

When the 3741 is the spooled reader, the STOP RDR and START RDR operator control commands are used.

Multiprogramming and Dual Programming

A dual programming system (Model 8, 10, or 12) can use the 3741 in either level (1 or 2); a multiprogramming system (Model 15) can use the 3741 in any partition. A System/3 program can allocate the 3741 only if:

- You specify the 3741 during system generation.
- The 3741 is not allocated to the other program level or partition.
- The 3741 is not allocated to a program that was rolled out from the other program level or partition.
- The 3741 is not being used as the **READER** for the other program level or partition.
- The 3741 is not being used as the spooled reader (Model 15).

If the 3741 is the **READER** or **PUNCH**, the use of data management or device-independent data management is restricted to one program level (Model 8, 10, or 12) or to one partition (Model 15).

Checkpoint/Restart

During the execution of a program that allows checkpoints, the system issues HY halts whenever a checkpoint is taken. At these points, you must note the diskette being processed, the data set being processed, and the position of the 3741. If the program is writing to the 3741, then:

1. Take the 3741 offline by pressing FUNCT SEL upper, then T (on the 3741).
2. Search to EOD and press REC ADV.
3. Record the address (track and sector) displayed on the 3741 display screen.
4. Place the 3741 online and continue.

If the program is reading from the 3741, record the current address (track and sector) displayed on the 3741 display screen before continuing.

If you later use restart, insert the diskette noted for the particular checkpoint into drive 1 and position the diskette head at the track/sector address noted. The 3741 is now properly positioned for restart when you place the 3741 online.

Rollout/Rollin (Inquiry)¹

Writing: If the main program is writing to the 3741 and if the interrupting (inquiry) program requires the use of the 3741, you should note the track and sector address on the 3741 display screen. When the system issues the rollout halt, press FUNCT SEL upper, then T on the 3741. This causes the EOD field in the label to be updated and the 3741 to go offline. When the system issues the halt to allow you to reposition devices for the resumption of the mainline program, do the following:

1. Insert the diskette previously used into drive 1 (even if the diskette was in drive 2 prior to the interruption).
2. Locate the data set used previously.
3. Search to EOD and press REC ADV.
4. Place the 3741 online.
5. Respond to the rollin halt.

Reading: If the main program is reading from the 3741 and if the interrupting program requires the use of the 3741, note the track and sector address on the display screen when the rollout halt is issued. Then simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET to take the 3741 offline. When the system issues the halt to allow you to position devices for the resumption of the mainline program, insert the diskette in drive 1, position the diskette head to the previously noted address, and place the 3741 online. After you respond to the halt, processing resumes with the diskette record at the indicated track and sector address.

OCL

OCL statements can be entered on the device assigned as the READER (see *READER*), or they can be called from the procedure library on disk. These OCL statements contain these 3741 parameters:

```
// READER 3741  
    Assigns the 3741 as the READER (all System/3 models).
```

```
// PUNCH 3741  
    Assigns the 3741 as the PUNCH (all System/3 models).
```

```
// PUNCH DEVICE-3741  
    Assigns the 3741 as the PUNCH (Model 15).
```

```
// FILE NAME-filename,  
    UNIT-3741 (,RECL-nnn)  
    Assigns the 3741 as the unit to be used by device-independ-  
    ent data management to read or write a data set (Model  
    15). RECL specifies the record length of the data set and  
    can be any number from 1 to 128. If this parameter is  
    omitted, the assumed length is:
```

\$COPY, input or output – 96

\$DSORT, input – 96

User programs (for example, RPG II) – Record length
specified in the program.

Notes:

1. When the Model 6 is in conversational mode and issues a READER or PUNCH prompt, you can respond with 3741.
2. The system considers the statements entered following a // IMAGE statement as OCL even though there is no // in positions 1 and 2. All image statements are read from the READER.

¹ Not supported by Model 15 SCP 5704-SC2.

OCC

Operator control commands (OCC) perform certain system operations on the Model 15. The following commands are used with the 3741:

```
READER { P1 }  
(RDR) { P2 } ,3741  
        { P3 }
```

Assigns the 3741 as the system input device for the specified partition.

```
STOP RDR  
(P) (R)  
Stops the spooled reader.
```

```
START RDR  
(S) (R)  
Starts the spooled reader.
```

IPL

The 3741 cannot be the IPL (initial program load) device. After IPL from a disk, you can enter the current date from the 3741 if the user assigned the 3741 as the READER during system generation. Alternately, you can select the 3741 as the system input device at IPL by using the console switches (Model 8, 10, or 12) or by OCC (Model 15).

Because you cannot perform IPL from the 3741, you cannot load standalone object programs from the 3741. You can execute object programs from the 3741 only under control of the SCP (see *LOAD **).

LOAD *

When you are using the *LOAD ** function, the OCL can be in the same data set as the program, or it can be in a different data set. In either case, a */** record must follow the object program; EOD, or pressing FUNCT SEL upper then T, does not delimit the object program.

For example, you can load an object program from the 3741 by including the following records in a data set:

```
// LOAD *  
// RUN  
(object program)  
/*
```

Canceling a Job (Flushing a Job Stream)

You cannot cancel a program from the 3741. System/3 controls all the program functions except end of file. Whether you use a card reader or a 3741 as the READER, responding to a halt with a cancel option (2 or 3) causes the job stream to be flushed until one of the following statements is read:

```
// LOAD  
All System/3 models except when in job mode on  
Model 15.
```

```
// CALL  
All System/3 models except when in job mode on  
Model 15.
```

```
/ &  
All System/3 models except when in job mode on  
Model 15.
```

```
/ .  
Only when in job mode on Model 15.
```

```
// JOB  
Only when in job mode on Model 12 or 15.
```

If the 3741 is assigned as the physical reader and if EOD is detected before one of the preceding statements is processed, the result depends on the mode as follows:

- When in mode 1, the 3741 goes offline and System/3 issues a not-ready halt. You must either put the 3741 online so that one of these statements can be read, or respond to the not-ready halt with a 3 option that causes an EJ halt to be issued.
- When in mode 2, the diskette head returns to the index track and the 3741 remains online. System/3 appears to be in a busy loop.
- When in mode 3, 4, or 5, the diskette head returns to the index track and the 3741 continues on to the next valid data set and continues processing.
- When in mode 2, 3, 4, or 5, you can take the 3741 offline by simultaneously pressing ALPHA SHIFT, NUM SHIFT, and RESET. When System/3 Model 6, 8, 10, or 12 issues the not-ready halt, you can respond with a 3 option that causes an EJ halt. System/3 Model 15 does not issue a not-ready halt when you simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET; a not-ready halt is issued when you press FUNCT SEL upper, then T.

Programs

The I/O adapter feature allows a 3741 (any model) to be attached to a System/3 via a 3741 attachment feature. A 3741 Model 2 or 4 has a BSCA feature that permits local or remote communications with System/3. The 3741 can have both an I/O adapter and a BSCA facility, but only one can be in use. The BSCA feature can be used only when the 3741 is offline.

An RPG II program can specify both a directly attached 3741 and a BSCA 3741, but these must be separate 3741 units.

CCP

Object programs that specify the 3741 as a unit record device can be executed under control of CCP.

The following CCP programs use the system input device; thus, the 3741 can be used for:

- Assignment build.
- Generation.
- Assignment list.
- User security information build.
- Display format generator.
- Disk to printer dump program.
- File recovery program.
- CCP startup (FEREP processor).

The generation print/punch utility is a CCP program that uses the PUNCH and can therefore use the 3741.

MRJE

The MRJE/WS program supports the 3741 Data Station Models 1 and 2 and the 3741 Programmable Work Station Models 3 and 4 on all System/3 models. The input/output record length is 96 bytes; 80 bytes of each record are used by the program and the remaining 16 bytes are left blank.

RJE

The RJE program cannot use the 3741 for job stream input. Use the copy/dump program (\$COPY) to copy job streams to disk prior to loading the RJE program.

You can read the OCL to load the RJE program from the 3741.

Copy/Dump Program (Model 6, 8, 10, or 12)

When you are using a System/3, you can use the copy/dump program (\$COPY) to transfer data records between the 3741 and other devices. You cannot use the COPYPACK function to copy diskettes. During one execution of the \$COPY program, a diskette file can be either input or output, but not both.

You can read control statements from the device assigned as the READER; therefore, you can read \$COPY control statements from the 3741. When you do this, the record length for the diskette data set containing the control statements must be 96 bytes. If data records exist in the same data set, the record length must be 96 bytes. If not, the data must be in another data set.

3741 Input File: Data management processes a diskette file that is to be read as input to \$COPY. Record length is from 1 to 128 bytes, but must be the same for all records in the file. If OCL and control statements are in the same data set, record length must be 96 bytes.

The COPYFILE control statement specifies the record length for data to be read by \$COPY. The format of this statement is:

```
// COPYFILE OUTPUT-DISK, INPUT-3741,  
LENGTH-nnn
```

The record length (nnn) must be the same as the record length on the data set label or System/3 issues a halt. If the length parameter is not specified, 96 is assumed.

Output devices can be:

	Model				
	6	8	10	12	
DATA96	X				129 Card Data Recorder
DATA96	X				5496 Data Recorder
MFCU			X	X	5424 Multi-Function Card Unit
TAPE		X	X	X	3410/3411 Magnetic Tape Subsystem
1403			X	X	1403 Printer
1442			X	X	1442 Card Read Punch
2222	X				2222 Printer
3340				X	3340 Direct Access Storage Facility
5203		X	X	X	5203 Printer
5213	X				5213 Printer
5444	X	X	X		5444 Disk Storage Drive (indexed or sequential file)
5445			X		5445 Disk Storage (indexed or sequential file)
5448		X	X		5448 Disk Storage Drive (indexed or sequential file)

Note: See appropriate OCL manual for control statements.

Normally, the record length of the output file is the same as the record length for the input file. If the record length of the diskette input file is less than the record length for the output file, each record in the output file is padded with blanks (X'40'). If the record length of the diskette input file is greater than the record length of the output file, the records in the input file are truncated; that is, only the number of positions in the input record that fit into the output record are copied. If the diskette record length is 128 bytes and cards are punched on the MFCU, only positions 1 through 96 from each record are punched.

An end-of-file record (or EOD if using mode 1) terminates the input file. The end-of-file record can contain /* or /& as the first two characters. (The remainder of the record is blank.) An end-of-file record should be in the last data set read if you are using mode 2, 3, 4, or 5. If the end-of-file record does not exist, the operator must use FUNCT SEL upper, then T to end the file.

If the end-of-file record contains a character other than blank between position 3 and the end of the record, the record is treated as a data record and copied to the output file. Thus, a job stream that includes a /* or /& record can be copied to another file if the record contains comments after position 2. If the input file is read from the READER, /& is always considered an end of file rather than a comment.

You can specify \$COPY functions of record selection and deletion for a diskette input file. Optionally, you can print records as they are copied to another file.

3741 Output File: Data management processes a diskette file to be written as output from the \$COPY program. Only a sequential file can be written. Record length is from 1 to 128 bytes, but must be the same for all records in the file. If OCL and control statements are read from the 3741, operator intervention is required to change modes from read to write.

The format of the COPYFILE statement for a 3741 output file is as follows:

```
// COPYFILE OUTPUT-3741,LENGTH=nnn
```

The specified length must be the same as the record length in the data set label or System/3 issues a halt. If the length parameter is not specified, 96 is assumed.

Input devices can be:

- DATA96 — 129 Card Data Recorder
- DATA96 — 5496 Data Recorder
- MFCU — 5424 Multi-Function Card Unit
- TAPE — 3410/3411 Magnetic Tape Subsystem (blocked or unblocked records)
- 1442 — 1442 Card Read Punch
- 3340 — 3340 Direct Access Storage Facility
- 5444 — 5444 Disk Storage Drive (indexed or sequential file)
- 5445 — 5445 Disk Storage (indexed or sequential file)
- 5448 — 5448 Disk Storage Drive (indexed or sequential file)

Note: See appropriate OCL manual for control statements.

You can copy indexed files sequentially or consecutively.

Considerations for record length are the same as for the input file.

Copy/Dump Program (Model 15)

When you are using the Model 15, you can specify the 3741 as an input or output device for the COPYFILE function of the copy/dump program (\$COPY). You cannot use the COPYPACK function to copy diskettes. During one execution of the \$COPY program, a diskette file can be either input or output, but not both.

You can read control statements from the device assigned as the READER; therefore, you can read \$COPY control statements from the 3741. When you do this, the record length for the diskette data set containing the control statements must be 96 bytes.

3741 Input File: Device independent data management processes a diskette file that is to be read as input to \$COPY. Record length can be from 1 to 128 bytes, but must be the same for all records in the file. If OCL and control statements are in the same data set, record length must be 96 bytes.

The // FILE statement (see *OCL*) determines the record length for data to be read by \$COPY. The specified length must be the same as the record length in the data set label, otherwise, System/3 issues a halt. If the length parameter is not specified, 96 is assumed.

Output devices can be:

- MFCM — 2560 Multi-Function Card Machine
- MFCU — 5424 Multi-Function Card Unit
- TAPE — 3410/3411 Magnetic Tape Subsystem (blocked or unblocked records)
- 1403 — 1403 Printer
- 1442 — 1442 Card Read Punch
- 3284 — 3284 Printer.
- 3340 — 3340 Direct Access Storage Facility
- 3344 — 3344 Direct Access Storage
- 5444 — 5444 Disk Storage Drive (indexed or sequential file)
- 5445 — 5445 Disk Storage (indexed or sequential file).

Normally, the record length of the output file is the same as the record length for the input file. If the record length of the diskette input file is less than the record length for the output file, each record in the output file is padded with blanks (X'40'). If the record length of the diskette input file is greater than the record length of the output file, the records in the input file are truncated; that is, only the number of positions in the input record that fit into the output record are copied. If the diskette record length is 128 and cards are punched on the MFCU, only positions 1 through 96 from each record are punched.

An end-of-file record (or EOD if using mode 1) terminates the input file. The end-of-file record can contain /*, /&, or /. as the first two characters. (The remainder of the record is blank.) An end-of-file record should be in the last data set read if you are using mode 2, 3, 4, or 5. If the end-of-file record does not exist, the operator must use FUNCT SEL upper, then T to end the file.

If the end-of-file record contains a character other than blank between position 3 and the end of the record, the record is treated as a data record and copied to the output file. Thus, a job stream that includes a /*, /&, or /. record can be copied to another file if the record contains comments after position 2. If the input file is read from the READER, /& and /. are always considered as end of file rather than comments.

You can specify \$COPY functions of record selection and deletion for a diskette input file. Optionally, you can print records as they are copied to another file.

3741 Output File: Device independent data management processes a diskette file to be written as output from the \$COPY program. Only a sequential file can be written. Record length is from 1 to 128 bytes, but all records in the file must be the same length. If OCL and control statements are read from the 3741, operator intervention is required to change modes from read to write.

The // FILE statement (see *OCL*) specifies the record length for data to be written by \$COPY. The specified length must be the same as the record length in the data set label or System/3 issues a halt. If the length parameter is not specified, 96 is assumed.

Input devices can be:

- MFCM — 2560 Multi-Function Card Machine
- MFCU — 5424 Multi-Function Card Unit
- TAPE — 3410/3411 Magnetic Tape Subsystem
- 1442 — 1442 Card Read Punch
- 2501 — 2501 Card Reader
- 3340 — 3340 Direct Access Storage Facility
- 3344 — 3344 Direct Access Storage
- 5444 — 5444 Disk Storage Drive (indexed or sequential file)
- 5445 — 5445 Disk Storage (indexed or sequential file)

You can copy indexed files sequentially or consecutively.

Considerations for record length are the same as for the input file.

Dump/Restore Program (Model 12, 15)

This system service program (\$DCOPY) is used to provide a backup copy of data stored on disk. A backup copy is created by copying (dumping) data from disk to magnetic tape or to the 3741 diskette. \$DCOPY is also used, if necessary, to copy data from the backup medium back to disk (restore). If the 3741 diskette is used as the backup medium, \$DCOPY will copy only a 5444 disk or a 5444 simulation area.

The Dump/Restore program uses the BACKUP-3741 parameter to specify the diskette as the backup medium. If the BACKUP-3741 parameter is omitted, magnetic tape is the assumed backup medium. The following control statement shows this parameter and other parameters associated with the // COPYPACK statement:

```
// COPYPACK { FROM-code } [ ,PACK-name ]  
            { TO-code }  
            [ ,BACKUP- { 3741 } ] [ ,SYSTEM- { code } ]  
            { TAPE }           { YES }  
                               { NO }
```

The SYSTEM-code parameter specifies that the cylinder 0 IPL area is to be dumped, along with the simulation area, from the disk drive specified. SYSTEM-YES (applicable only to 3340) specifies that the cylinder 0 IPL area is to be dumped or restored along with the 5444 simulation area. If the parameter is omitted, SYSTEM-NO is assumed and only the 5444 simulation area is dumped or restored. For a complete description of the remaining parameters, refer to the appropriate *System Control Programming Reference* manual listed in the bibliography.

Considerations and Restrictions: The diskette record length must be 128 bytes when dumping to, or restoring from, the 3741.

Control statements can be read from the device assigned as the READER; therefore, control statements for \$DCOPY can be read from the 3741. OCL record length must be 96 bytes.

Library Maintenance Program

The library maintenance program (\$MAINT) uses the READER to:

- Read control statements.
- Read data for the READER-to-library function. This function is used to copy source modules, object modules, routines, or OCL procedures to the library on disk. One or more modules can be copied with a single execution of the \$MAINT program.
- Read input for the MODIFY function. This function is used to modify source or procedure statements in the source library.

\$MAINT uses the PUNCH for the library-to-PUNCH function. This function is used to copy source modules, object modules, routines, or OCL procedures to the PUNCH device. Either individual modules or an entire library can be copied.

Since libraries do not exist on a diskette, the allocate, delete, and rename functions do not apply to the 3741; however, control statements for these functions can be read from the 3741.

When used with any \$MAINT input or library-to-PUNCH function, the diskette data set must have a record length of 96 bytes.

The library-to-PUNCH function writes records that are identical to those punched on a card I/O device. Each record in an input job stream on a diskette has the same format as for card input.

OCL, control statements, and input records can be in the same or different data sets on one or more diskettes.

Note: When using the \$MAINT program to punch modules on a 3741, you have to change modes from read to write and then to read if the control statements are also read from the 3741.

For example:

```
// LOAD $MAINT,R1  
// RUN  
// COPY FROM-R1,TO-PUNCH . . .  
// END
```

When the COPY statement is read, you change the 3741 to write mode; the module is punched and you change the 3741 to read mode so the END statement can be read (see *Example 9* in Chapter 6).

Macro Processor

The macro processor reads source input from the READER; therefore, input statements for the macro processor can be read from a 3741. As with input from cards, the source input on the 3741 must be followed by a /* statement; reaching EOD in mode 1 does not terminate the source input. Figure 13 shows the macros for Models 8, 10, 12, and 15.

When the 3741 is used for macro processor input, the record length for the diskette data set must be 96 bytes. The OCL and input statements can be in the same or in different data sets.

Overlay Linkage Editor

The overlay linkage editor uses the READER to read control statements and relocatable input; therefore, you can use the 3741 for overlay linkage editor input. The overlay linkage editor uses the PUNCH to write the object program generated by the overlay linkage editor; therefore, you can use the 3741 for overlay linkage editor output. (Record length for the diskette data set in either case must be 96 bytes.) The OCL and overlay linkage editor input can be in the same or different data sets.

System Generation

System generation for the Model 8, 10, or 12 can use the 3741 as the READER and PUNCH. Record length must be 96 bytes. For Models 6 and 15, system generation is conversational and does not use the 3741 for input or output.

System History Area Display

The copy-to-file function of the system history area display (\$HIST) can use the 3741 as an output device (Model 15 only).

Other Utilities

The functions performed by the following SCP programs are not available for the 3741. You can however, read the OCL and control statements for these programs from a 3741 assigned as READER. (Record length for the diskette data set must be 96 bytes, except if you are spooling the input; then record length can be 1-128 bytes.)

\$ALT	Alternate track assignment
\$BUILD	Alternate track rebuild
\$CNFIG	Configuration record
\$DELET	File delete
\$FCOMP	File compress
\$INIT	Initialize disk
\$KLEAN	Chain cleaning
\$LABEL	File and volume label display
\$PCOPY	Disk pack backup/restore
\$RINDX	Recover index
\$RSALT	Reassign alternate track program
\$SCOPY	3340 simulation area program
\$TINIT	Initialize tape
\$TVES	Tape volume error statistics
\$VTOC	5445 data interchange
\$WVTOC	1000-file VTOC conversion program

Macro Name		Function
Models 8, 10, and 12	Model 15	
\$DTFK	\$DTFK	Declares storage for a preopen DTF.
\$DTOD	\$DTFO D3741-Y (for data management) \$DTFO IND-Y (for device independent data management)	Defines the offsets for a DTF.
\$GETK	\$GETK	Generates the linkage to the GET routine.
\$PUTK	\$PUTK	Generates the linkage to the PUT routine.

Figure 13. Macros for Models 8, 10, 12, and 15

PROGRAM PRODUCTS

This section describes each program product and the extent to which it can be used with the 3741. Figure 14 shows which program products apply to each model of System/3.

System/3 Program Product	Model				
	6	8	10	12	15
RPG II	X	X	X	X	X
Subset ANS COBOL		X	X	X	X
Disk FORTRAN IV	X	X	X	X	X
Basic Assembler		X	X	X	X
Disk Sort	X	X	X	X	X
CCP/Disk Sort		X	X	X	X
Tape Sort		X	X	X	X
Disk resident card utilities			X	X	X
Conversational utilities	X				
1255 utility	X	X	X	X	
DATA/3		X	X	X	
System/3 BASIC	X				X ¹

¹ Not with Model 15D.

Figure 14. Program Products

RPG II

Source programs for the compiler are read on the device assigned as the **READER**; therefore, you can read RPG II source statements, including auto report specifications, from the 3741. When you do this, the record length for the diskette data set must be 96 bytes. The OCL and source statements can be in the same or different data sets. You can use the 3741 to read compile time tables. The source program that specifies the 3741 can also include specifications for the RPG II features, auto report, telecommunications, 5445, and tape. A source program that includes tables must be followed by a `/*` even though mode 1 is used.

The object program generated by the compiler can be placed on the device assigned as the **PUNCH**; therefore, RPG II object programs can be written on the 3741. (Record length for the diskette data set must be 96 bytes.)

If the 3741 is used for both input (OCL and/or source program) and output (object program), you must change from read to write mode.

Normally, only one file description specification is used to define a 3741 file in an RPG II source program; however, preexecution-time tables or arrays can also be defined. An RPG II source program can specify one of the following for the 3741:

- One input file
- One input file *and* preexecution-time tables/arrays
- One output file
- One output file *and* preexecution-time tables/arrays
- One output file *and* table/array output
- Preexecution-time tables/arrays
- Table/array output

Note: These combinations are valid even if file conditioning indicators (U1 through U8) are used.

You can process only sequential files; a combined or update file cannot be specified for the 3741. An input file on the 3741 can contain spread card records.

Only fixed length, unblocked records can be specified. Record length is from 1 to 128 bytes (3 to 128 if input spooling is used). Double buffering is optional.

The device name used on the file description specification is **DISKET**. When using Model 15 RPG II, you can leave the device name blank on the file description specification for a diskette file to indicate that device independent data management is to be used. When device independent data management is used, a **FILE** statement is included with the OCL for the object program to identify the device to be used for the file.

Subset ANS COBOL

Source programs for the COBOL compiler are read on the device assigned as the **READER**; therefore, you can read COBOL source statements from the 3741. (Record length for the diskette data set must be 96 bytes.) The OCL and source statements can be in the same or different data sets. The source program must be followed by a `/*` even though mode 1 is used.

The object program generated by the compiler is processed by the overlay linkage editor and can be placed on the device assigned as the PUNCH; therefore, COBOL object programs can be written on the 3741. (Record length for the diskette data set must be 96 bytes.)

If the 3741 is used for both input (OCL and/or source program) and output (object program), you must change from read to write mode.

The ACCEPT verb uses the READER; therefore, data can be read from a diskette by using: ACCEPT field name. You can use an SCP program (\$COPY) to transfer the records between a 5444 and a 3741.

Model 15 COBOL 5704-CB2 also supports the 3741 as a consecutive input and consecutive output device. Diskette object program support is provided by specification of 3741 as the device parameter on the ASSIGN clause.

You can only process consecutively; a combined or update file cannot be specified for the 3741. However, the COBOL user can specify input and output files in the same program. To do this, the user must close one file type (input or output) before opening the other file type. The 3741 diskette must be positioned (by the user) to the correct record.

Only fixed length, unblocked records can be specified. Record length is from 1 to 128 bytes (3 to 128 if input spooling is used). Double buffering is optional.

FORTRAN IV

Source programs for the FORTRAN compiler are read on the device assigned as the READER; therefore, you can read FORTRAN source statements from the 3741. When you do this, the record length for the diskette data set must be 96 bytes. The OCL and source statements can be in the same or different data sets. The source program must be followed by a /* even though mode 1 is used.

The object program generated by the compiler is processed by the overlay linkage editor, and can be placed on the device assigned as the PUNCH; therefore, FORTRAN object programs can be written on the 3741. (Record length for the diskette data set must be 96 bytes.)

If you use the 3741 for both input (OCL and/or source program) and output (object program), you must change modes from read to write.

With other than Model 15 FORTRAN 5704-FO2, you cannot specify the 3741 in a FORTRAN source program. You can use an SCP program (\$COPY) to transfer the records between a 5444 and the 3741.

Model 15 FORTRAN 5704-FO2 also supports the 3741 as an input or output device. Diskette object program support is provided by specifying the 3741 as a READ or PUNCH device on the Device Options Statement.

You can process only consecutively; the 3741 cannot be specified as a combined file. However, the FORTRAN user can specify input and output operations in the same program. For each change in mode (input or output), the 3741 must be positioned to the correct record by the user.

Only fixed length, unblocked records can be specified. Record length is from 1 to 128 bytes (3 to 128 if input spooling is used). Double buffering is optional.

Basic Assembler

Source programs for the basic assembler program are read on the device assigned as the READER; therefore, you can read basic assembler source statements from the 3741.

When you do this, the record length for the diskette data set must be 96 bytes. The OCL and source statements can be in the same or different data sets. If the source program contains macro statements, it must be first processed by the macro processor. (See *Macro Processor*.) The source program must be followed by a /* even though mode 1 is used.

The output of the basic assembler program is processed by the overlay linkage editor and can be placed on the device assigned as the PUNCH; therefore, assembler object programs can be written on the 3741. When you do this, the record length for the diskette data set must be 96 bytes.

To help you write assembler language programs that use the 3741, you can use the macros that are available with the SCP. (See *Macro Processor*.)

Disk Sort and CCP/Disk Sort

OCL and sort specifications for the disk sort are read on the device assigned as the **READER**; therefore, you can read these statements from the 3741. When you do this, the record length for the diskette data set must be 96 bytes. The OCL and sort specifications can be in the same or different data sets. A /* or // **END** statement must follow the sort specifications even though mode 1 is used.

The disk sort cannot be used on the Model 6, 8, 10, or 12 for the direct input or output of 3741 data files. If you are using the Model 15 disk sort (not CCP/Disk Sort) you can use data on a diskette for direct input to the sort. The sort functions for the 3741 are the same as for a card input file because the records are fixed length and unblocked. The record length of the diskette records is from 1 to 128 bytes. The 3741 cannot be assigned as the output file.

You can use an SCP program (**\$COPY**) to transfer the data from the 3741 to a disk prior to sorting diskette data.

The 3741 is not supported for data input or output in the CCP/Disk Sort program.

Tape Sort

OCL and sort specifications for the tape sort program are read on the device assigned as the **READER**; therefore, you can read these statements from the 3741. When you do this, the record length for the diskette data set must be 96 bytes. The OCL and sort specifications can be in the same or different data sets. A /* or // **END** statement must follow the sort specifications even though mode 1 is used.

Input and output files for the tape sort can reside only on magnetic tape.

Disk Resident Card Utilities

The OCL statements for the card utilities are read on the device assigned as the **READER**; therefore, you can read these statements from the 3741. (Record length for the diskette data set must be 96 bytes.)

Model 10 Disk System

Neither specifications nor data for the utilities can be on a diskette.

Models 12 and 15

The specifications for **\$CSORT** and **\$GANGP**, and the data for **\$CLIST**, are read on the device assigned as the **READER**; therefore, you can read these specifications or data from the 3741 (96-byte records). Neither specifications for the other programs nor data for any of the programs can be on a diskette.

Conversational Utilities

Neither control statements nor data for Model 6 keyboard source entry and keyboard data entry programs is read from the 3741. The data interchange utility reads control statements from the device assigned as the **READER**; therefore, these statements can be read from the 3741. (Record length for the diskette data set must be 96 bytes.)

1255 Utility

OCL and utility specifications for the utility program for the 1255 Magnetic Character Reader are read on the device assigned as the **READER**; therefore, you can read these statements from the 3741. (Record length for the diskette data set must be 96 bytes.) The OCL and utility specifications can be in the same or different data sets.

DATA/3

Input for the **DATA/3** program generator is read on the device assigned as the **READER**; therefore, you can read the input from the 3741. (Record length for the diskette data set must be 96 bytes.) The OCL and **DATA/3** input can be in the same or different data sets.

RPG II programs generated by **DATA/3** do not use the 3741.

System/3 BASIC

The 3741 cannot be used with **System/3 BASIC**.

Chapter 4. Modes of Operation

When you place the 3741 online, you must select one of five modes of operation and indicate whether you will be reading records into System/3 or writing records on the 3741.

For reading, mode selection depends on what action is needed when EOD (end of data) is reached. (The EOD address is the address of the sector after the last record in the data set. EOD condition occurs when System/3 attempts to read another record at the EOD address.) The only difference between write modes 1, 2, and 5 is the action needed when EOE (end of extent) is reached; the write operations are otherwise identical. For either reading or writing, modes 4 and 5 are for special applications and should be used only after careful consideration.

System/3 is not aware of the mode you select. In fact, whenever an operation stops to allow you to change diskettes or to find another data set, you can select a different mode before placing the 3741 back online.

Figure 16 shows a brief summary of the five modes. Detailed descriptions of each read and write mode follow in this chapter.

When using data management to write in any mode and the last record is written, the System/3 program terminates, the 3741 goes offline and the data set label of the last data set is updated with the proper EOD.

When the 3741 is PUNCH (for example, \$MAINT library-to-PUNCH), the 3741 does *not* go offline when the last record is sent. When the operator presses FUNCT SEL upper, then T, the 3741 goes offline and the data set label is updated.

Each of the mode descriptions is in the following format:

Function: Describes the function performed when the mode is selected.

Preparation: Indicates the steps required to place the 3741 online.

Termination: Explains the action taken to terminate processing and/or the normal end of job procedure.

Continuation: Explains how certain modes allow multiple data sets to be processed in a single setup. Also, discusses the use of the second diskette drive.

Error Condition: Lists some of the common error conditions. (*Chapter 5* contains a more complete list.)

Considerations: Describes special considerations not previously discussed.

Examples: Illustrates, where necessary, the use of the mode. (*Chapter 6* contains examples to assist you in planning your applications.)

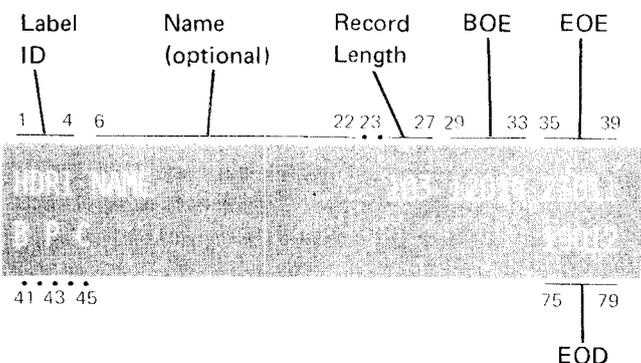
Mode	When Used for a Read	When Used for a Write
1 — Single data set, single volume.	At EOD, the 3741 goes offline. (The EOD address is the address of the sector after the last record in the data set. EOD condition occurs when System/3 attempts to read another record at the EOD address.)	Used to write a single data set. If EOE is reached before end of job, an extent error occurs; writing can then be resumed in another data set.
2 — Multiple data sets for a read operation (operator controlled).	At the end of each data set, operator action is required either to position to another data set or to terminate the operation.	Same as mode 1.
3 — Multiple data sets; C indicates automatic move to next diskette.	At EOD, a C multivolume indicator (in label) allows subsequent records to be read from the next diskette.	Used to write multiple data sets. If EOE occurs before end of job, the data set is continued on another diskette.
4 — Multiple data sets; user-assigned ending sequence.	The 3741 inserts operator-defined records between data sets and at end of job to denote these conditions.	Used to write multiple data sets. The 3741 looks for operator-defined data records to indicate the end of data set and end of job.
5 — Multiple data sets; the C multivolume indicator ignored.	At EOD, reading continues with the next available data set.	Same as mode 1.

Figure 16. Summary of Modes 1, 2, 3, 4, and 5

INITIAL OPERATING INSTRUCTIONS FOR MODES 1, 2, 3, 4, AND 5

Checking Data Set Labels

Each data set label on a diskette must be checked for overlapping extents. Note that some entries are required while others are optional; entry requirements also vary between modes. For the displayed entries for a given mode, see the preparation step for that mode. A description of all fields in the data set label is included in the description of the index track label (*Appendix B*).



1-4	Label identification	Must be HDR1.
6-22	Data set name	(Optional — used for operator convenience. Note that the entry is left-justified.)
23-27	Record length	Positions 23 and 24 are blank; a number from 1 to 128 in positions 25 through 27. All data sets for one file must have the same record length (Figure 4).

29-33 BOE }
 35-39 EOE }
 75-79 EOD }

Format for these fields is TTOSS where TT is a track number (1 through 73) and SS is a sector number (1 through 26).

41	Bypass indicator	Blank if the data set is to be processed. B if the data set is to be bypassed.
42	Data set security	Blank. (If there is a non-blank entry, the data set is secured; do <i>not</i> try to change the entry to blank.)
43	Write protect	Blank or P.
44	Interchange type	Blank.
45	Multivolume indicator (MVI)	Blank, C, or L.

Locating the First Record to be Processed

If you want to begin at the first data set record (BOE), position the diskette head at the data set label. If you want to begin within a data set, use update mode and position at the desired record.

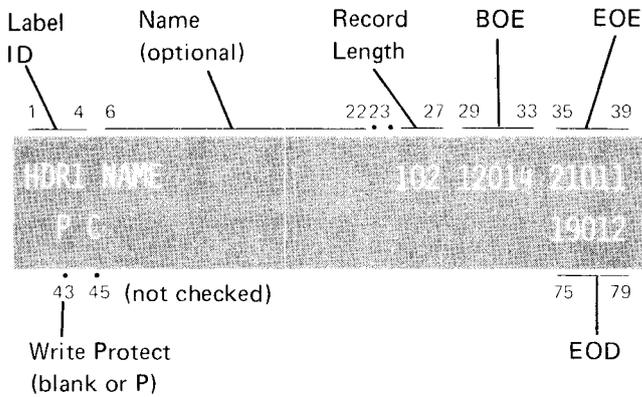
READING – MODE 1, SINGLE DATA SET

Function

Reads a single data set into System/3. At EOD, the 3741 goes offline.

Preparation

1. Check the data set label:



2. Locate the first record to be processed.
3. To select the mode, key 41.
4. Press FUNCT SEL upper, then DUP.

Termination

Any time you want to immediately take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. The 3741 goes offline, the diskette head returns to sector 8 of the index track, and the 3741 appears not-ready to System/3.

Model 15

EOD is the same as end of file but causes different actions depending on whether System/3 data management for 3741 processes the records or the 3741 is the READER or spooled reader.

- If data management processes the records (3741 is not the READER or spooled reader) and EOD occurs on the 3741:
 - An end-of-file condition is indicated in the System/3 program.
 - The diskette head returns to the index track.
 - The 3741 goes offline.
 - The 3741 keyboard is activated.
- If the 3741 is the READER or spooled reader and EOD occurs on the 3741:
 - The 3741 is set to a not-ready condition (IKOYNR halt posted on System/3).
 - The diskette head returns to the index track.
 - The 3741 keyboard is activated.

Model 6, 8, 10, or 12

EOD is the same as end of file but causes different actions depending on whether System/3 data management for 3741 processes the records or the 3741 is the READER.

- If data management processes the records (3741 is not the READER) and EOD occurs on the 3741:
 - An end-of-file condition is indicated in the System/3 program.
 - The diskette head returns to the index track.
 - The 3741 goes offline.
 - The 3741 keyboard is activated.
- If the 3741 is the READER and EOD occurs on the 3741, the 3741 is set to a not-ready condition (15 is posted in positions 5 and 6 of the status line on the 3741 screen).

If the system is at end of job, the operator may do one of the following:

1. Respond to the end of job by pressing: HALT RESET switch on the processing unit (dual programming system), or START switch on the processing unit (system without dual programming) which will cause a halt (0Y01 for Model 8, 10, or 12; CD124501 for Model 6). The diskette head will return to the first header label on the index track.
2. Use the ALPHA SHIFT, NUM SHIFT, and RESET keys to return to the first header label on the index track.

If the system is in no-halt mode, a halt is displayed (0Y01 for Model 8, 10, or 12; CD124501 for Model 6). At EOD the diskette head will return to the first header label on the index track.

Continuation

In mode 1, only one data set is processed. To process another data set, you must repeat the preparation steps listed.

Note: The second drive feature of the 3741 cannot be used with mode 1.

Error Conditions

Listed are some of the possible error conditions. See *Chapter 5. Error Conditions* for a discussion of error conditions and status codes.

Error Indication (Positions 5 through 8 on 3741 Status Line)	System/3 Halt	Reason
1A bb	0Y	Wrong mode.
1B bb	0Y	Wrong record length.
1C bb	0Y	Wrong record length.
(offline)	0Y	3741 not ready.

Considerations

If both OCL and data are in the same data set, all records must be 96 bytes long.

READING – MODE 2, MULTIPLE DATA SETS; OPERATOR CONTROLLED

Function

Reads multiple data sets into System/3. At the end of each data set, you select the next one to be processed or, optionally, indicate that no more are to be processed.

Preparation

Do the following before processing each data set:

1. Check the data set label:

Label ID	Name (optional)	Record Length	BOE	EOE
1 4 6		2223 27 29	33 35	39
43 45 (not checked)			75 79	
Write Protect (blank or P)			EOD	

2. Locate the first record to be processed.
3. To select the mode, key 42 in positions 1 and 2.
4. Press FUNCT SEL upper, then DUP.

Termination

At EOD, the diskette head returns to the index track (at the label of the data set just processed) and the 3741 keyboard is activated. Since the 3741 is still considered online by System/3, no halt requiring operator action occurs on System/3. At this point, you can select another data set to be processed or cause end of file for data management by:

1. Keying 4 into position 1.
2. Pressing FUNCT SEL upper, then T.

Any time you want to immediately take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. The 3741 goes offline, the diskette head returns to sector 8 of the index track, and the 3741 appears not ready to System/3.

Continuation

To process each subsequent data set, you must repeat the preparation steps listed. The mode selection entry (42) can be changed between data sets or can remain at 42. The System/3 processes a continuous file of records (on one or more data sets) and is not aware of mode changes you make. For example, a mode selection of 41 for a subsequent data set causes an automatic end of file when that data set is completely processed.

Note: The second drive feature of the 3741 cannot be used with mode 2. If a subsequent diskette is to be processed, it is inserted into drive 1.

Error Conditions

Listed are some of the possible error conditions. See *Chapter 5. Error Recovery* for a discussion of error conditions.

Error Indication (Positions 5 through 8 on 3741 Status Line)

System/3 Halt	Reason
1A bb	Wrong mode.
1B bb	Wrong record length.
1C bb	Wrong record length.
(offline)	3741 not ready.

Note: At EOD, the diskette head returns to the index track (at the label for the data set just processed). System/3 tries to read another record but the 3741 requires operator attention. At this point, System/3 is in a busy loop until you set up the 3741 again (including mode selection). After mode selection, the System/3 continues reading records without operator intervention required on System/3.

Considerations

If multiple data sets contain data for the same logical file, the same record length must be in the label of each data set.

READING – MODE 3, MULTIPLE DATA SETS

Function

Reads multiple data sets into System/3 without requiring operator intervention for each data set. A C entry in the MVI field of a data set label indicates that the next data set to be processed is the first available data set on the next diskette.

Preparation

Do the following before processing each diskette:

1. Check each data set label on the diskette:

Label ID	Name (optional)	Record Length	BOE	EOE
1 4 6		22 23 27 29	33 35	39
HDR1	NAME	102 12014 21011		
C				19012
41 43 45			75 79	
			EOD	

- 41: Bypass indicator – Blank if the data set is to be processed; B if the data set is to be bypassed.
- 43: Write protect – Blank or P.
- 45: MVI – Blank except as follows. A C entry indicates that this is the last data set to be processed on this diskette and that processing is to continue with the first available data set on the next diskette. (See *Continuation* for this mode.) An L entry is ignored.

2. Locate the first record to be processed.
3. To select the mode, key 43 in positions 1 and 2.
4. Press FUNCT SEL upper, then DUP.

Termination

At EOD, the diskette head returns to the index track and the next available data set label is located. The 3741 remains online until you cause end of file to occur. The job can be terminated by System/3 action such as reaching end of job or job step, or canceling the job.

Any time you want to immediately take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. The 3741 goes offline, the diskette head returns to sector 8 of the index track, and the 3741 appears not ready to the System/3.

If an error condition occurs during processing or the 3741 is taken offline and the keyboard is activated, you can cause end of file by:

1. Keying 4 in position 1.
2. Pressing FUNCT SEL upper, then T.

Continuation

3741 with One Drive

When EOD is reached for a data set, the diskette head returns to the index track. Action taken at this point depends on whether or not the MVI field contains a C.

If the label of the data set just processed does *not* contain a C in the MVI field, the next available label on the same diskette is located. If all labels on the diskette are processed, the 3741 stops (with a 10C1 error indication) to allow you to change diskettes. If a 16C1 error code is displayed, do not change diskettes until the error code is 10C1. Refer to *3741 Errors* for information on recovering from a 16xx error code changed to a 10xx error code. When you insert the new diskette, the search for the next available label occurs automatically after you press RESET. (RESET must be pressed to change the message condition.)

If the label of the data set just processed does contain a C in the MVI field, the 3741 stops (with a 10C1 indication) to allow you to change diskettes. (The C indicates that the next data set is on another diskette.)

3741 with Two Drives

If the second drive is ready when processing is complete on the first drive, control switches automatically to the second drive (no operator intervention required). You can change diskettes in the first drive while the second is being processed. When processing is complete on the diskette in the second drive, control passes automatically back to the first drive, and so on.

When the second drive address is displayed in the status line, the diskette in the second drive is being processed; if the second drive address is not displayed, then the diskette in the first drive is being processed.

If at any time the other drive (first or second) is not ready, the 3741 stops (with a 10C1 or 10C2 error indication) to allow operator action. Processing always resumes on the first drive regardless of where the error occurred.

Error Conditions

Some possible error conditions are:

Error Indication (Positions 5 through 8 on 3741 Status Line)

System/3 Halt	Reason
1A00	Wrong mode.
1B00	Wrong record length.
1C00 (offline)	Wrong record length.
10C1	3741 not ready.
10C2	Next diskette not ready or not changed.
10B1	Next diskette not ready or not changed.
	Positioned on bypass data set.

Record Length Error: All data sets that are to be considered as a single file must have identical record length specifications in the header labels. A record length error can indicate that:

- The data set is not to be processed and should have a B (bypass) indicator in the label.
- The wrong diskette is inserted.
- The desired data set has an altered record length field in the label.

To correct a record length error, take the 3741 offline by simultaneously pressing ALPHA SHIFT, NUM SHIFT, and RESET; correct the error; and place the 3741 online. Processing always resumes on drive 1 after operator actions, regardless of where the error occurred.

See *Chapter 5. Error Conditions* for a further description of error conditions and status codes.

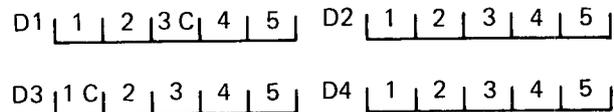
Considerations

System/3 SCP is not aware of the mode you selected or of information contained in the label. It is your responsibility to ensure that record lengths are consistent and that data sets are processed in the desired sequence.

Examples

43 Read – Single Drive

Assume that the 3741 being used has only one drive and that data for a single file is to be processed by an RPG II program. The data is contained on four diskettes (D1, D2, D3, and D4); each diskette contains five data sets. In the following diagram, the numbered segments are data set labels and C indicates there is a continuation byte in the MVI field of the label.



1. Diskette D1 is readied.
2. Data sets 1, 2, and 3 from diskette D1 are read.
3. A 10C1 error is posted to indicate that a new diskette must be inserted in drive 1. (System/3 does not issue a halt but appears to be in a busy loop.)
4. The cover is opened, the diskette is replaced, the cover is closed, and RESET is pressed.
5. Data sets 1, 2, 3, 4, and 5 on diskette D2 are processed. After data set 5 is processed, steps 3 and 4 are repeated.
6. Data set 1 on diskette D3 is processed and steps 3 and 4 are again repeated.
7. When all valid data sets on diskette D4 are processed, the 3741 again posts a 10C1 error. At this point, FUNCT SEL upper, then T are pressed to indicate to System/3 that all records are processed (end of file). The 3741 goes offline. (If a /* record follows the last data record, end of file is indicated to the System/3 but the 3741 remains online. If the system is in a no-halt mode, additional data sets will be processed when the operator replaces the diskette and presses RESET.)

Notes:

1. If, while processing drive 1, the diskette cover is opened and closed after a 10C1 error and before RESET is pressed; when RESET is pressed, processing continues at the data set identified by the first valid label. If a new diskette is not inserted, the same data may be processed another time.
2. The termination procedure (FUNCT SEL upper, then T) can be used only when a 10C1 error occurs on the 3741.

43 Read – Two Drives

This example uses a 3741 with two drives to process the same data as in the preceding example.

1. Diskettes D1 and D2 in drives 1 and 2, respectively, are readied.
2. Data sets 1, 2, and 3 from diskette D1 are read.
3. Without operator intervention, data sets 1, 2, 3, 4, and 5 are read from diskette D2.
4. While diskette D2 is being processed, the cover of drive 1 is opened, diskette D1 is removed, diskette D3 is inserted, and the cover is closed.
5. After data set 5 on diskette D2 is processed, processing continues at the data set identified by the first valid label on diskette D3.
6. While diskette D3 is being processed, the cover of drive 2 is opened, diskette D2 is removed, diskette D4 is inserted, and the cover is closed.
7. After the first data set on diskette D3 is processed, processing continues at the data set identified by the first valid label on diskette D4.
8. When all valid data sets on diskette D4 are processed, the 3741 posts a 10C1 error, indicating that drive 1 needs attention. (System/3 does not issue a halt, but appears to be in a busy loop.) At this point, FUNCT SEL upper, then T are pressed to indicate to System/3 that all records are processed (end of file). The 3741 goes offline. (If a /* record follows the last data record, end of file is indicated to System/3 but the 3741 remains online with a 10C1 posted.)

Notes:

1. If processing is completed on drive 2 (or 1), and the cover has not been opened on the other drive, a 10C1 or 10C2 error is posted on the 3741. Following this situation, the next diskette to be processed must be in drive 1.
2. If, while processing drive 2 (or 1), the cover of the other drive is opened and closed, processing continues on the other drive at the data set identified by the first valid label. If a new diskette has not been inserted, the same data may be processed again.
3. The termination procedure (FUNCT SEL upper, then T) can be used only when a 10C1 or 10C2 error occurs on the 3741.
4. If a diskette is not ready on drive 2, a 10C1 error is indicated if drive 2 was not previously used; a 10C2 error is indicated if drive 2 was previously used. In either case, the next diskette to be processed must be on drive 1.

READING – MODE 4, MULTIPLE DATA SETS; USER ASSIGNED ENDING SEQUENCE

Function

Reads multiple data sets into System/3 without requiring operator intervention for each data set. At the end of each data set, a 3741-generated record is sent to System/3 to be used as a separator between data sets.

Preparation

Do the following before processing each diskette:

1. Check each data set label on the diskette:

Label ID	Name (optional)	Record Length	BOE	EOE
1 4 6		22 23 27 29	33 35	39
41 43 45			75	79
			EOD	

- 41: Bypass indicator – Blank if the data set is to be processed; B if the data set is to be bypassed.
- 43: Write protect – Blank or P.
- 45: MVI – Blank, except as follows:
A C entry indicates that this is the last data set to be processed on this diskette and that processing is to continue with the first available data set on the next diskette. (See *Continuation* for this mode.)

2. Locate the first record to be processed.

3. To select the mode:
 - a. Key 44 in positions 1 and 2.
 - b. Key any three characters into positions 3, 4, and 5. The characters keyed into positions 3 and 4 identify the separator record between data sets. The characters keyed into positions 3 and 5 identify the end of file.

For the purpose of this discussion, the characters X, Y, and Z are used. X and Y are the characters keyed into positions 3 and 4; X and Z are the characters keyed into positions 3 and 5.

For example, if columns 3, 4, and 5 contain /S*, at the end of each data set the 3741 sends to System/3 a separator record with /S in positions 1 and 2. (All remaining positions are blank.) When you indicate that no more records are to be processed (end of file) by pressing 4, FUNCT SEL upper, then T, the 3741 sends a /* record to System/3 (a /* in the first two positions of the record).

4. Press FUNCT SEL upper, then DUP.

Termination

The 3741 remains online until you cause end of file to occur or System/3 action terminates the job. The job can be terminated by System/3 actions such as reaching end of job or job step, or canceling the job. If an error condition occurs during processing and the keyboard is activated, you can indicate that there are no more records to be processed by pressing FUNCT SEL upper, then T.

Any time you want to immediately take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. The 3741 goes offline, the diskette head returns to sector 8 of the index track, and the 3741 appears not ready to System/3.

Continuation

When EOD is reached for a data set, the diskette head returns to the index track and the next available label is located.

3741 with One Drive

If the label of the data set just processed does not contain a C in the MVI field, the next available label on the same diskette is located. If all labels on the diskette are processed, the 3741 stops (with a 10C1 indication) to allow you to change diskettes. When you insert the new diskette, the search for the next available label occurs automatically after you press RESET.

If the label of the data set just processed contains a C in the MVI field, the 3741 stops (with a 10C1 indication) to allow the operator to change diskettes. An XY record is not sent to System/3, since a continued data set is considered only part of a data set. The C in the MVI field indicates that the next data set is on another diskette.

3741 with Two Drives

If the second drive is ready when processing is complete on the first drive, control switches automatically to the second drive (no operator intervention required). You can change diskettes in the first drive while the second is being processed. When processing is completed on the diskette in the second drive, control is then passed automatically back to the first drive, and so on.

When the second drive address is displayed in the status line, the diskette in the second drive is being processed; if the second drive address is not displayed, then the diskette in the first drive is being processed.

If at any time the other drive (first or second) is not ready, the 3741 stops (with a 10C1 or 10C2 error indication) to allow operator action. Processing resumes on the first drive.

Error Conditions

Some possible error conditions are:

Error Indication (Positions 5 through 8 on 3741 Status Line)	System/3 Halt	Reason
1A bb	0Y	Wrong mode.
1B bb	0Y	Wrong record length.
1C bb	0Y	Wrong record length.
(offline)	0Y	3741 not ready.
10C1	None	Next diskette not ready.
10C2	None	Next diskette not ready.
10B1	None	Positioned on bypass data set.

Record Length Error: All data sets that are to be considered as a single file must have identical record length specifications in the header labels. A record length error can indicate that:

- The data set is not to be processed and should have a B (bypass) indicator in the label.
- The wrong diskette is inserted.
- The desired data set has an altered record length field in the label.

To correct a record length error, take the 3741 offline by simultaneously pressing ALPHA SHIFT, NUM SHIFT, and RESET; correct the error; and place the 3741 online. Processing always resumes on drive 1 after operator actions, regardless of where the error occurred.

See *Chapter 5. Error Conditions* for a further description of error conditions and status codes.

Considerations

When you indicate end of file from the 3741, a special record is sent to System/3; this record contains the characters that you keyed into positions 3 and 5 during preparation. The user program on System/3 must test for this record and initiate the end-of-job procedure in the program. (There is no automatic end-of-file procedure.) As soon as the 3741 sends this record to System/3, the 3741 goes offline, and the diskette head returns to sector 8 of the index track.

System/3 program uses the separator records, which are interspersed in the data, to recognize different batches of data. The user program should test for these records to avoid an unidentified record situation.

If you use mode 4 for reading records to be processed by System/3 data management, the user program should specify single buffering for the 3741 file. If you use double buffering for data management the XZ record should be an end-of-file delimiter (/ * or / & for the Model 6, 8, 10, or 12; / * , / & , or / . for the Model 15); otherwise, System/3 issues a not-ready halt before the XZ record can be processed by the program. If System/3 issues the not-ready halt, you must either:

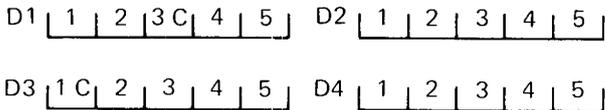
- Respond with a 2 or 3 option to the halt in order to cancel the program,
- or*
- Press 4, then FUNCT SEL upper, then T on the 3741; then respond to the not-ready halt with a 1 option.

System/3 SCP is not aware of the mode you select or of information contained in the label. It is your responsibility to ensure that record lengths are consistent and that data sets are processed in the desired sequence.

Examples

44 Read – Single Drive

Assume that the 3741 being used has only one drive and that data for a single file is to be processed by an RPG II program. The data is contained on four diskettes (D1, D2, D3, and D4); each diskette contains five data sets. In the following diagram, the numbered segments are data set labels and C indicates there is a continuation byte in the MVI field of the label:



1. Diskette D1 on drive 1 is readied.
2. Data set 1 from diskette D1 is read. At EOD, a record is generated that contains XY in positions 1 and 2 (the remaining positions are blank). Data set 2 is then read and another XY record is generated; data set 3 is then read but an XY record is not generated since there is a C in the MVI field. (For an explanation of XY and XZ records, see *Preparation* for this mode.)
3. A 10C1 error is posted to indicate that a new diskette must be inserted in drive 1. (System/3 does not issue a halt but appears to be in a busy loop.)
4. The cover is opened, the diskette is replaced, the cover is closed, and RESET is pressed.
5. Data sets 1, 2, 3, 4, and 5 on diskette D2 are then processed. As with diskette D1, XY records are generated at each EOD. After data set 5 is processed, steps 3 and 4 are repeated.
6. Data set 1 on diskette D3 is processed (an XY record is not generated), and steps 3 and 4 are repeated.
7. When all valid data sets on diskette D4 are processed, the 3741 again posts a 10C1 error. At this point, FUNCT SEL upper, then T, are pressed to cause the 3741 to generate an XZ record. The 3741 goes offline. The RPG II program must test for the presence of the XZ record and set on the LR indicator when the XZ record is read. This is the way *last record* (end of file) is detected when using mode 4. (For an explanation of XY and XZ records, see *Preparation* for this mode.)
8. System/3 data management recognizes a /* as end of file. Thus, if a /* record is encountered in a data set, end of file occurs, but the 3741 remains online and neither an XY nor an XZ record is generated.

Notes:

1. If, while processing drive 1, the diskette cover is opened and closed after a 10C1 error and before RESET is pressed; when RESET is pressed, processing continues at the data set identified by the first valid label. If a new diskette is not inserted, the same data may be processed again.
2. The termination procedure (FUNCT SEL upper, then T) can be used only when a 10C1 error occurs on the 3741.
3. If XZ is an end-of-file delimiter (/*, /&, or, on the Model 15, a /.), end of file is indicated to System/3 when FUNCT SEL upper, then T, are pressed to terminate the job. In this case, the RPG II program does not need to test for the XZ record. (This is applicable only for files processed by data management.)
4. If the X and Y characters are / and *, the 3741 does not go offline at the end of any data set (EOD), and an end of file is indicated for each data set. (This is applicable only for files processed by data management.)
5. The following technique can be used if the XZ record is not required. When a 10C1 error is posted, instead of FUNCT SEL upper, then T being pressed, either:
 - ALPHA SHIFT, NUM SHIFT, and RESET are simultaneously pressed,
 - or
 - 4 is keyed into position 1; then FUNCT SEL upper, then T, are pressed.

This causes an end-of-file indication to System/3.

6. In the example, if the user's program does not test for the XZ record, the following can occur:
 - The XZ record can cause an error (unidentified record).
 - The program can attempt to read another record; but since the 3741 is offline, System/3 issues a not-ready halt.

44 Read – Two Drives

Assume that the 3741 being used has two drives and that you will process the same data as in the preceding example.

1. Diskettes D1 and D2 are readied in drives 1 and 2, respectively.
2. Data sets 1, 2, and 3 from diskette D1 are read; when the EOD is reached for each data set, XY records are generated for data sets 1 and 2.
3. Without operator intervention, data sets 1, 2, 3, 4, and 5 are read from diskette D2. XY records are generated for the EOD for each of the data sets.
4. While diskette D2 is being processed, the cover of drive 1 is opened, diskette D1 is removed, diskette D3 is inserted, and the cover is closed.
5. At the completion of processing the data set 5 on diskette D2, processing continues at the data set identified by the first valid label on diskette D3.
6. While diskette D3 is being processed, the cover of drive 2 is opened, diskette D2 is removed, diskette D4 is inserted, and the cover is closed.
7. At the completion of processing the first data set on diskette D3, processing continues at the data set identified by the first valid label on diskette D4. (An XY record is not generated.)
8. When all valid data sets on diskette D4 are processed, the 3741 posts a 10C1 error, indicating that drive 1 needs attention. (System/3 does not issue a halt, but appears to be in a busy loop.) At this point, FUNCT SEL upper, then T are pressed to cause the 3741 to generate an XZ record. The 3741 goes offline. The RPG II program must test for the presence of the XZ record and set on the LR indicator when the XZ record is read. This is the way *last record* (end of file) is detected when using mode 44.

Notes:

1. If processing is completed on drive 2 (or 1) and the cover has not been opened on the other drive, a 10C1 or 10C2 error is posted on the 3741. Following this situation, the next diskette to be processed must be in drive 1.
2. If, while processing drive 2 (or 1), the cover of the other drive is opened and closed, processing continues on the other drive at the data set identified by the first valid label. If a new diskette has not been inserted, the same data can be processed again.
3. The termination procedure (FUNCT SEL upper, then T) can be used only when a 10C1 or 10C2 error occurs on the 3741.
4. If a diskette is not ready on drive 2, a 10C1 error is indicated if drive 2 was *not* previously used; a 10C2 error is indicated if drive 2 was previously used. In either case, the next diskette to be processed must be on drive 1.
5. See notes 3 through 6 for the *44 Read – Single Drive* example.

READING – MODE 5, MULTIPLE DATA SETS

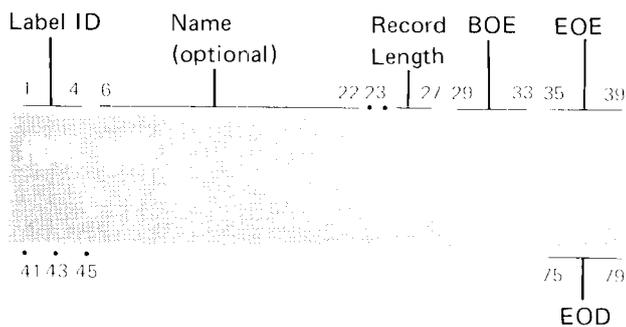
Function

Reads multiple data sets into System/3 without requiring operator intervention for each data set. Mode 5 is the same as mode 3 except that the C in the MVI field of the data set label is ignored. This mode is useful primarily for processing diskettes created by the IBM 3747 Data Converter.

Preparation

Do the following before processing each diskette:

1. Check each data set label on the diskette:



- 41: Bypass indicator – Blank if the data set is to be processed; B if the data set is to be bypassed.
- 43: Write protect – Blank or P.
- 45: MVI – Blank except as follows: C or L in the MVI field is ignored (considered the same as a blank).

2. Locate the first record to be processed.
3. To select the mode; key 45 in positions 1 and 2.
4. Press FUNCT SEL upper, then DUP.

Termination

The 3741 remains online until you cause end of file to occur by pressing FUNCT SEL upper, then T. The job can be terminated by System/3 action such as reaching end of job or job step, or canceling the job.

Any time you want to immediately take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. The 3741 goes offline, the diskette head returns to sector 8 of the index track, and the 3741 appears not ready to the System/3.

Continuation

When EOD is reached for a data set, the diskette head returns to the index track and the next available data set label is located.

3741 with One Drive

The next available label on the same diskette is found. If all labels on the diskette are processed, the 3741 stops with a 10C1 indication to allow you to change diskettes. When you insert the new diskette, the search for the next available label occurs automatically after you press RESET.

Note: A C entry in the MVI field does not indicate that a data set is continued on another diskette.

3741 with Two Drives

If the second drive is ready when processing on the first drive is complete, control automatically switches to the second drive (no operator intervention required). You can change diskettes in the first drive while the second is being processed. At completion of processing of the diskette in the second drive, control passes automatically back to the first drive, and so on.

If at any time the other drive (first or second) is not ready, the 3741 stops with a 10C1 or 10C2 error indication to allow operator action. Processing always resumes on the first drive regardless of where the error occurred.

Error Conditions

Some possible error conditions are:

Error Indication (Positions 5 through 8 on 3741 Status Line)	System/3 Halt	Reason
1A bb	0Y	Wrong mode.
1B bb	0Y	Wrong record length.
1C bb	0Y	Wrong record length.
(offline)	0Y	3741 not ready.
10C1	None	Next diskette not ready.
10C2	None	Next diskette not ready.
10B1	None	Positioned on bypass data set.

Record Length Error: All data sets that are to be considered as a single file must have identical record length specifications in the header labels. A record length error can indicate that:

- The data set is not to be processed and should have a B (bypass) indicator in the label.
- The wrong diskette is inserted.
- The desired data set has an altered record length field in the label.

To correct a record length error, take the 3741 offline by simultaneously pressing ALPHA SHIFT, NUM SHIFT, and RESET; correct the error; and place the 3741 online. Processing always resumes on drive 1 after operator actions, regardless of where the error occurred.

See *Chapter 5. Error Conditions* for a further description of error conditions and status codes.

Considerations

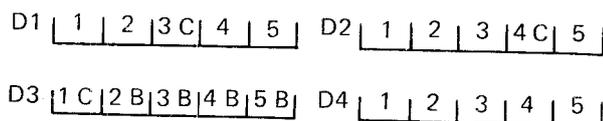
System/3 SCP is not aware of the mode you select or of information contained in the label. It is your responsibility to ensure that record lengths are consistent and that data sets are processed in the desired sequence.

For the IBM 3747 Data Converter, a blank or C in the MVI field of the data set label means that the data set is not complete with that label and that the next data set on the same diskette contains additional data. An L indicating the last data set for the 3747 Data Converter is not recognized by System/3.

Examples

45 Read – Single Drive

This example uses a 3741 with only one drive and data for a single file to be processed by an RPG II program. The data is contained on four diskettes (D1, D2, D3, and D4); each diskette contains five data sets. In the following diagram, the numbered segments are data set labels and C indicates there is a continuation byte in the MVI field of the label; a B indicates the data set is to be bypassed:



1. Diskette D1 in drive 1 is readied.
2. Data sets 1, 2, 3, 4, and 5 from diskette D1 are read.
3. A 10C1 error is posted to indicate that a new diskette must be inserted in drive 1. (The System/3 does not issue a halt but appears to be in a busy loop.)
4. The cover is opened, the diskette is replaced, the cover is closed, and RESET is pressed.
5. Data sets 1, 2, 3, 4, and 5 on diskette D2 are then processed. After data set 5 is processed, steps 3 and 4 are repeated.
6. Data set 1 on diskette D3 is processed (data sets 2, 3, 4, and 5 are bypassed), and steps 3 and 4 are repeated.
7. When all valid data sets (1, 2, 3, 4, and 5) on diskette D4 are processed, the 3741 again posts a 10C1 error. At this point, FUNCT SEL upper, then T, are pressed to indicate to System/3 that all records are processed (end of file has occurred). The 3741 goes offline. (If a /* record follows the last data record, end of file is indicated to the System/3 but the 3741 remains on-line.)

Notes:

1. If, while processing drive 1, the diskette cover is opened and closed after a 10C1 error and before RESET is pressed, processing continues at the data set identified by the first valid label. If a new diskette is not inserted, the same data can be processed again.
2. The termination procedure (FUNCT SEL upper, then T) can be used only when a 10C1 error occurs on the 3741.
3. Mode 5 is the same as mode 3 except that a C in the MVI field of the data set label is ignored.

45 Read – Two Drives

This example uses a 3741 with two drives to process the same data as in the preceding example.

1. Diskettes D1 and D2 are readied in drives 1 and 2, respectively.
2. Data sets 1, 2, 3, 4, and 5 from diskette D1 are read.
3. Without operator intervention, data sets 1, 2, 3, 4, and 5 are read from diskette D2.
4. While diskette D2 is being processed, the cover of drive 1 is opened, diskette D1 is removed, diskette D3 is inserted, and the cover is closed.
5. At the completion of processing the data set 5 on diskette D2, processing continues at the data set identified by the first valid label on diskette D3.
6. While diskette D3 is being processed, the cover of drive 2 is opened, diskette D2 is removed, diskette D4 is inserted, and the cover is closed.
7. At the completion of processing the first data set on diskette D3, processing continues at the data set identified by the first valid label on diskette D4 (data sets 2, 3, 4, and 5 on diskette D3 are bypassed).
8. When all valid data sets (1, 2, 3, 4, and 5) on diskette D4 are processed, the 3741 posts a 10C1 error, indicating that drive 1 needs attention. (The System/3 does not issue a halt but appears to be in a busy loop.) At this point, the operator presses FUNCT SEL upper, then T, to indicate to System/3 that all records are processed. The 3741 goes offline. (If a /* record follows the last data record, end of file is indicated to System/3 but the 3741 remains online.)

Notes:

1. If processing is completed on drive 2 (or 1) and the cover has not been opened on the other drive, a 10C1 or 10C2 error is posted on the 3741. Following this situation, the next diskette to be processed must be in drive 1.
2. If, while processing drive 2 (or 1), the cover of the other drive is opened and closed, processing continues on the other drive at the data set identified by the first valid label. If a new diskette has not been inserted, the same data can be processed again.
3. The termination procedure (FUNCT SEL upper, then T) can be used only when a 10C1 or 10C2 error occurs on the 3741.
4. If a diskette is not ready on drive 2, a 10C1 error is indicated if drive 2 was not previously used; a 10C2 error is indicated if drive 2 was previously used. In either case, the next diskette to be processed must be on drive 1.

WRITING – MODES 1, 2, AND 5

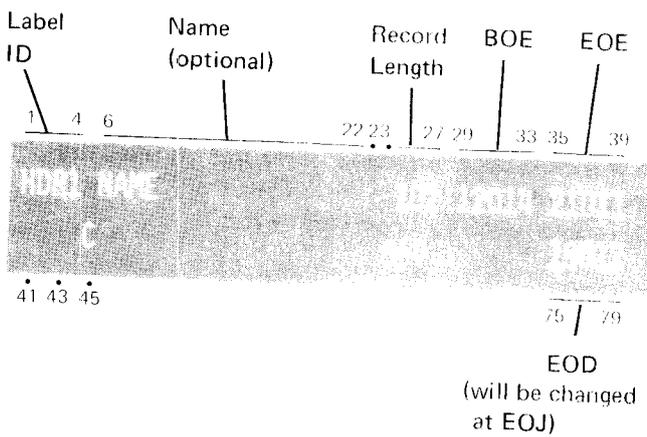
Function

Writes records on one or more data sets on one or more diskettes on drive 1. If the records are written using System/3 data management, the 3741 goes offline when the last record is written (end of file). If the records are written using System/3 PUNCH, the 3741 remains online when the last record is written.

Preparation

Do the following before processing each diskette:

1. Check the data set label:



- 41: Bypass indicator – Blank if the data set is to be written; B if the data set is to be bypassed.
- 43: Write protect – Must be blank if the data set is to be written. (You can insert a P in this position at end of job in order to protect the data.)
- 45: MVI – Not checked (C or L is ignored).

2. Locate the first record to receive data.
3. To select the mode; key 41, 42, or 45 in positions 1 and 2.
4. Press FUNCT SEL upper, then FIELD COR.

Termination

Data Management: When the last record is written while using System/3 data management, the diskette head returns to the index track and the EOD field in the label is updated. The 3741 goes offline. If you cancel the System/3 program prior to its completion, you can take the 3741 offline by pressing FUNCT SEL upper, then T. This causes the EOD field in the label to be updated.

PUNCH: When the last record is written while the 3741 is used as the System/3 punch device, the diskette head does not move, the 3741 remains online, and 11 is posted in positions 5 and 6 of the status line on the 3741. When 11 is posted, you can take the 3741 offline by pressing FUNCT SEL upper, then T.

The diskette head returns to the index track and the EOD field in the label is updated. The 3741 goes offline.

Note: For either data management or PUNCH functions, you can take the 3741 offline at any time by simultaneously pressing ALPHA SHIFT, NUM SHIFT, and RESET. Since the EOD field is not updated and the remaining records in the 3741 buffer are not written on the diskette, up to 12 records are lost. Use ALPHA SHIFT, NUM SHIFT, and RESET when you do not need to save these remaining records in the 3741 buffer (as when canceling the System/3 program with a 3 option).

Continuation

If EOE is reached before the last record is written:

- The diskette head returns to the index track.
- The EOD field in the label is updated.
- An extent error (E1) is posted.
- The label of the data set just written is displayed.
- System/3 appears to be in a busy loop.

To continue writing records:

1. Continue on another data set by pressing RESET. Locate the next data set label (on the same or on a different diskette) on drive 1. Record length must be the same as for the previously written records. Select the mode by:
 - a. Keying 41, 42, or 45 into positions 1 and 2.
 - b. Pressing FUNCT SEL upper, then FIELD COR.

Writing of records resumes with no further operator action.

2. Continue on the same data set by changing the EOE field in the label:
 - a. Press RESET.
 - b. Change the EOE field, using caution to avoid extending into an adjacent data set by:
 - Keying a new EOE.
 - Pressing FUNCT SEL lower.
 - Keying M
 - Pressing REC ADV.
 - c. Press FUNCT SEL lower.
 - d. Press DUP (search EOD).
 - e. Press REC ADV.
 - f. Key 41, 42, or 45 into positions 1 and 2.
 - g. Press FUNCT SEL upper, then FIELD COR.

Writing of records resumes with no further operator action.

Note: If, while the directly attached 3741 is being used for output by data management or system punch, end of extent is reached before all records are written, the last record will probably not be written onto the diskette if you do either of the following:

- Put the next data set online in read mode after the extent (E1) error, or
- Press the ALPHA SHIFT, NUM SHIFT, RESET sequence after the extent error.

Error Conditions

Some possible error conditions are:

Error Indication (Positions 5 through 8 on 3741 Status Line)

Error Indication (Positions 5 through 8 on 3741 Status Line)	System/3 Halt	Reason
1A bb	0Y	Wrong mode.
1B bb	0Y	Wrong record length.
1C bb	0Y	Wrong record length.
(offline)	0Y	3741 not ready.
10X1	None	Overlapping extents.
10E1	None	Extent error.
10E2	None	Extent error.

A Z is displayed in position 7 of the status line if a bad-spot record was written.

A W is displayed in position 7 of the status line if a bad-spot record was written in the last block of 13 records. If this occurs, up to 13 records can be lost.

The 3741 cannot be placed online for writing if the first data set is write-protected. Once the 3741 is online and past the first data set, any write-protected data set is bypassed.

See *Chapter 5. Error Conditions* for a further description of error conditions and status codes.

Considerations

If the operation was started from the index track, all labels are checked to ensure that there are no overlapping extents.

Diskette drive 2 cannot be used for writing modes 1, 2, or 5 because when an extent error occurs, recovery is always on drive 1.

If you simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET to immediately take the 3741 offline, up to 12 records are lost and the EOD field in the label is not updated.

When the 3741 is being used as the PUNCH it does not go offline at EOJ. As a result, successive PUNCH functions (such as multiple library-to-PUNCH operations) are written consecutively in one data set. The records written in the data set are the same records that would be punched by a card I/O device. (See *Chapter 6. Examples.*)

WRITING – MODE 3, MULTIPLE DATA SETS

Function

Writes records on more than one diskette without requiring operator intervention for each data set. To use this mode effectively, the Second Disk Feature is required. When EOE is reached, a C is written in the MVI field of the label and records continue to be written in the first available data set on the other drive.

When the last record is written while using System/3 data management (such as when end of file occurs), the 3741 goes offline. When the last record is written while using PUNCH, the 3741 remains online.

Preparation

Do the following before processing each diskette:

1. Check each data set label on the diskette:

Label ID	Name (optional)	Record Length	BOE	EOE
1 4 6		22 23 27 29	33 35	39
41 43 45		102 12014 21011		19012
			75 79	

EOD (will be changed at EOJ)

- 41: Bypass indicator – Blank if the data set is to be written; B if the data set is to be bypassed.
 - 43: Write protect – Must be blank if the data set is to be written. (You can insert a P in this position at the end of job in order to protect the data.)
 - 45: MVI -- Not checked (C or L is ignored).
2. Locate the first record to receive data.
 3. To select the mode, key 43 in positions 1 and 2.
 4. Press FUNCT SEL upper, then FIELD COR.

Termination

Data Management: When the last record is written while using System/3 data management, the diskette head returns to the index track and the EOD field in the label is updated. The 3741 goes offline. If you cancel the System/3 program prior to its completion, you can take the 3741 offline (11 is in positions 5 and 6 of the status line) by pressing FUNCT SEL upper, then T. This causes the EOD field in the label to be updated.

PUNCH: When the last record is written while the 3741 is used as the System/3 punch device, the diskette head does not move, the 3741 remains online, and 11 is posted in positions 5 and 6 of the status line. When 11 is posted, you can take the 3741 offline by pressing FUNCT SEL upper, then T. The diskette head returns to the index track and the EOD field in the label is updated. The 3741 goes offline.

Note: For either data management or PUNCH functions, the 3741 can be taken offline at any time by simultaneously pressing ALPHA SHIFT, NUM SHIFT, and RESET. Since the EOD field is not updated and the remaining records in the 3741 buffer are not written on the diskette, up to 12 records are lost. Use ALPHA SHIFT, NUM SHIFT, and RESET when you do not need to save these remaining records in the 3741 buffer (as when canceling the System/3 program with a 3 option).

Continuation

3741 with One Drive

If EOE is reached before the last record is written:

- The diskette head returns to the index track.
- The EOD field in the label is updated.
- A C is posted in the MVI field of the label.
- A continuation error (10C1) is posted.
- The label of the data set just written is displayed.
- System/3 appears to be in a busy loop.

To continue writing records, another diskette must be inserted in drive 1 as follows:

1. Open the cover, replace the diskette, and close the cover.
2. Press RESET.

The records are written into the data set identified by the first valid label in the index track (bypass and write-protected data sets are ignored).

When multiple diskettes are written, an L rather than a C is written into the MVI field of the label for the last data set written. If all records are contained within one data set, a blank is written in the MVI field of the label.

The record length must be the same in the label of each data set.

3741 with Two Drives

If EOE is reached before the last record is written, the diskette head returns to the index track, the EOD field in the label is updated, and a C is written in the MVI field. If the other drive is ready, records continue to be written into the data set on that drive identified by the first valid label. If the other drive is not ready, a 10C1 or 10C2 error is posted.

Insert a diskette into drive 1 and press RESET. Records continue to be written into the data set on drive 1 identified by the first valid label.

When multiple diskettes are written, an L rather than a C is written into the MVI field of the label for the last data set written. If all records are contained within one data set, a blank is written in the MVI field of the label.

The record length in the label of each data set must be the same for all records.

Error Conditions

Some possible error conditions are:

**Error
Indication
(Positions
5 through 8
on 3741
Status Line)**

**System/3
Halt**

Reason

1A bb	0Y	Wrong mode.
1B bb	0Y	Wrong record length.
1C bb	0Y	Wrong record length.
(offline)	0Y	3741 not ready.
10X1	None	Overlapping extents.
10C1	None	Continuation error.
10C2	None	Continuation error.

A Z is displayed in position 7 of the status line if a bad-spot record was written.

A W is displayed in position 7 of the status line if a bad-spot record was written in the last block of 13 records. If this occurs, 13 records can be lost.

You cannot place the 3741 online for writing if the first data set is write-protected. Once the 3741 is online and past the first data set, any write-protected data set is bypassed.

See *Chapter 5. Error Conditions* for a further description of error conditions and status codes.

Considerations

If the operation is started from the index track, all labels are checked to ensure that there are no overlapping extents. This checking is performed for each diskette processed.

When recovering from 3741 errors, processing always resumes on drive 1.

If the 3741 is taken offline by means of ALPHA SHIFT, NUM SHIFT, and RESET, up to 12 records are lost and the EOD field is not updated.

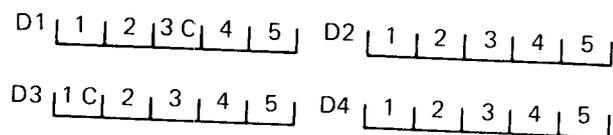
When the 3741 is being used as the PUNCH, it does not go offline at EOJ. As a result, successive PUNCH functions (such as multiple library-to-PUNCH operations) are written consecutively in one data set. The records written in the data set are the same records that would be punched by a card I/O device (see *Chapter 6. Examples*).

A data set label that has a P in the write-protect byte or that has a B in the bypass indicator is ignored.

Examples

43 Write – Single Drive

Assume that the 3741 being used has only one drive and that data for a single file is to be processed by an RPG II program (data management). The data is to be written on four diskettes (D1, D2, D3, and D4); each diskette contains five data sets. In the following diagram, the numbered segments are data set labels and C indicates there is a continuation byte in the MVI field of the label:



1. Diskette D1 in drive 1 is readied.
2. Records are written into data set 1 of diskette D1 until EOE is reached. A C is written in the MVI field of the label, and a 10C1 error is posted to indicate that a new diskette must be inserted in drive 1. (System/3 does not issue a halt but appears to be in a busy loop.)
3. The cover is opened, the diskette is replaced, the cover is closed, and RESET is pressed.
4. Records are written into data set 1 of diskette D2 until EOE is reached. A C is written in the MVI field of the label, and a 10C1 error is posted to indicate that a new diskette must be inserted in drive 1. (System/3 does not issue a halt but appears to be in a busy loop.)
5. The cover is opened, the diskette is replaced, the cover is closed, and RESET is pressed.
6. Records are written into data set 1 of diskette D3 until EOE is reached. A C is written in the MVI field of the label, and a 10C1 error is posted to indicate that the diskette must be replaced in drive 1. (System/3 does not issue a halt but appears to be in a busy loop.)
7. The cover is opened, the diskette is replaced, the cover is closed, and RESET is pressed.
8. Records are written into data set 1 of diskette D4 until the System/3 program indicates that end of file has occurred.
9. The diskette head returns to sector 8 of the index track, an L is written in the MVI field of the label, and the 3741 goes offline.

Notes:

1. Only one data set is written on each diskette.
2. When the 10C1 error is posted, the diskettes must be changed before RESET is pressed. If the diskette is not changed when the cover is opened and closed, records are written in the data set identified by the first valid label on the same diskette.

43 Write – Two Drives

This example shows the use of the second disk drive on the 3741 to minimize the amount of operator intervention required to process the same data as in the preceding example.

1. Diskettes D1 and D2 are readied in drives 1 and 2, respectively.
2. Records are written in the first data set of diskette D1. When EOE is reached, a C is written in the MVI field of the label.
3. Writing of records continues in the first data set of diskette D2. During this time, diskette D1 is removed from drive 1 and diskette D3 is inserted.

When EOE is reached on diskette D2, a C is written in the MVI field of the label.

4. Writing of records continues in the first data set of diskette D3. During this time, diskette D2 is removed from drive 2 and diskette D4 is inserted. When EOE is reached on diskette D3, a C is written in the MVI field of the label.

5. Records continue to be written in the first data set of diskette D4 until the System/3 program indicates that end of file has occurred.
6. The diskette head returns to the index track, an L is written in the MVI field of the label, and the 3741 goes offline.

Notes:

1. If processing is completed on drive 2 (or 1) and the cover has not been opened on the other drive, a 10C1 or 10C2 error is posted on the 3741. Following this situation, the next diskette to be processed must be in drive 1.
2. If, while processing drive 2 (or 1) the cover of the other drive is opened and closed, processing continues on the other drive at the data set identified by the first valid label. If a new diskette has not been inserted when the cover is opened and closed, the same data set may be processed again.
3. If a diskette is not ready on drive 2, a 10C1 error is indicated if drive 2 was not previously used; a 10C2 error is indicated if drive 2 was previously used. In either case, the next diskette to be processed must be on drive 1.

WRITING – MODE 4, MULTIPLE DATA SETS; USER-ASSIGNED ENDING SEQUENCE

Function

Write records in one or more data sets on one or more diskettes. The 3741 recognizes a specifically coded record that causes following records to be written in the data set identified by the next valid data set label.

Preparation

Do the following before processing each diskette:

1. Check each data set label on the diskette:

Label ID	Name (optional)	Record Length	BOE	EOE
1 4 6		22 23 27 29	33 35	39
41 43 45			75	79
			EOD	

- 41: Bypass indicator – Blank if the data set is to be written; B if the data set is to be bypassed.
- 43: Write Protect – Must be blank if the data set is to be written. (You can insert a P in this position at end of job in order to protect the data.)
- 45: MVI – Not checked (C or L is ignored).

2. Locate the first record to receive data.
3. Select the mode.
 - a. Key 44 in positions 1 and 2.
 - b. Key any three characters into positions 3, 4, and 5. The characters keyed into positions 3 and 4 identify the separator records between data sets. The characters keyed into positions 3 and 5 identify the end of data.

For the purpose of this discussion, the characters X, Y, and Z are used. X and Y are the characters keyed into positions 3 and 4; X and Z are the characters keyed into positions 3 and 5.

For example, if positions 3, 4, and 5 contain /ST, the 3741 updates the HDR1 label and begins a new data set when it receives a record from System/3 that contains a /S in the first two positions. The /S record is referred to as the XY record. The length of this record is the same as the length of other records in the file but the record is not written on the diskette. When the 3741 receives a record from System/3 that contains /T, the 3741 updates the data set label and goes offline. The /T record is referred to as the XZ record.

Note: A program or utility (such as \$COPY) that recognizes a /* record as end of file will fail if /* is used as the XZ record, unless a comment is included on the XZ record.

4. Press FUNCT SEL upper, then FIELD COR.

Termination

Mode 4 is terminated only by reception of the specified XZ record (/T in the previous example). When the XZ record is received: the diskette head returns to the index track; the EOD field in the label is updated; and the MVI field in the label is updated with blank if only one diskette is used, and L if multiple diskettes are used. The XZ record is not written on the diskette.

If the System/3 program is completed or canceled prior to sending an XZ record to the 3741, you can take the 3741 offline by pressing FUNCT SEL upper, then T. This causes the EOD field to be updated, but the MVI field is not updated.

Note: For either data management or PUNCH functions, you can take the 3741 offline at any time by simultaneously pressing ALPHA SHIFT, NUM SHIFT, and RESET. Since the EOD field is not updated and the remaining records in the 3741 buffer are not written on the diskette, up to 12 records are lost. Use ALPHA SHIFT, NUM SHIFT, and RESET when you do not need to save these remaining records in the 3741 buffer (as when canceling the System/3 program with a 3 option).

Continuation

3741 with One or Two Drives

For each XY record received on the 3741 (/S in the previous example), the diskette head returns to the index track, updates the EOD field in the label, and searches the index track for the next available data set label. The XY record is not written on the diskette.

When you reach EOE for the last data set on a diskette, a C is inserted in the MVI field of the label signifying that when the diskette is later used for a read operation in mode 3 or 4, the file is continued on another diskette.

3741 with One Drive

If EOE is reached before the XY record is received:

- The diskette head returns to the index track.
- The EOD field in the label is updated.
- A C is written in the MVI field of the label.
- A 10C1 error is posted on the 3741.
- The label of the data set just written is displayed.
- System/3 appears to be in a busy loop.

To continue writing records, another diskette must be inserted in drive 1 as follows:

1. Open the cover, replace the diskette, and close the cover.
2. Press RESET.

The records are written into the data set identified by the first valid label in the index track. (Bypass and write-protected data sets are ignored.)

3741 with Two Drives

If EOE is reached before the XY record is received, the diskette head returns to the index track, the EOD field in the label is updated, and a C is written in the MVI field. If the other drive is ready, records continue to be written into the data set identified by the first valid label. If the other drive is not ready, a 10C1 or 10C2 error is posted. A diskette is inserted into drive 1, RESET is pressed, and records continue to be written into the data set on drive 1 identified by the first valid label.

Error Conditions

Some possible error conditions are:

Error Indication (Positions 5 through 8 on 3741 Status Line)

System/3 Halt	Reason
0Y	Wrong mode.
0Y	Wrong record length.
0Y	Wrong record length.
0Y	3741 not ready.
–	Next diskette not ready.
–	Next diskette not ready.
–	Positioned on bypass data set.

1A bb	0Y	Wrong mode.
1B bb	0Y	Wrong record length.
1C bb	0Y	Wrong record length.
(offline)	0Y	3741 not ready.
10C1	–	Next diskette not ready.
10C2	–	Next diskette not ready.
10B1	–	Positioned on bypass data set.

See *Chapter 5. Error Conditions* for a further description of error conditions and status codes.

Considerations

The three special characters (keyed into columns 3, 4, and 5) should be selected from the 64-character set used for the 3741 keyboard (see *Appendix C. Valid 3741 Characters*); otherwise, the HEX key on the 3741 must be used to enter special codes.

Ensure that each data set to be written into is large enough to contain all records for that batch; otherwise, a 10C1 or 10C2 error can occur and operator intervention may be required.

Each time an XY record is received, the EOD and MVI fields of the label for the current data set are updated and the next valid label is located. Thus, if the first record received by the 3741 is an XY record, data is written beginning with the second valid data set label; the first label is updated with the EOD address being set equal to the BOE address. The MVI field is set to blank.

If two consecutive XY records are received, one data set is bypassed.

Note that an XY record is not needed immediately preceding the XZ record. The following example illustrates how an XY record preceding an XZ record can produce unwanted results. Assume that the last batch of data is written into data set 4 of a diskette and that this batch is followed by XY and XZ records. When the XY record is read, the EOD is updated and the MVI field is changed to blank. The 3741 is prepared to write into data set 5. When the XZ record is received, the 3741 updates the label for data set 5 with EOD equal to BOE, and an L is written into the MVI field if multiple diskettes are used for this job. The 3741 goes offline.

It is important that the System/3 program send an XZ record to the 3741 to terminate processing. Since System/3 is not aware of the mode (1 through 5) you select, System/3 always sends a signal to the 3741 to indicate end of job. The 3741, however, does not accept this signal if write mode 4 is being used. Instead, it waits until an XZ record is received, then terminates processing. In consideration of this point, note the following:

- If the XZ record is not sent before the program is completed (or canceled), a wrong mode error (1A**bb**) is posted because in write mode 4 the 3741 does not accept the end-of-job signal from System/3. The only recovery from this error is to simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET to take the 3741 offline. System/3 issues a not-ready halt and up to 12 records that are in the 3741 buffer are lost.
- After sending the XZ record to the 3741, the user program should perform some other processing for several seconds before closing the file in order to avoid a busy loop on System/3. If file closing occurs immediately after the XZ record is sent, the 3741 may not be offline when the end-of-job signal is sent to the 3741, resulting in a busy loop on System/3 with the 3741 offline. You may be unable to determine the cause of the loop on System/3. To recover from this situation, do the following:
 - For Model 6, perform IPL again.
 - For Model 8, 10, or 12 without DPF, perform IPL again.
 - For Model 8, 10, or 12 with DPF, select CANCEL and press the INTERRUPT key on the CPU console to cancel the program level.
 - For Model 15, enter a CANCEL command to cancel the partition with a 2 option.

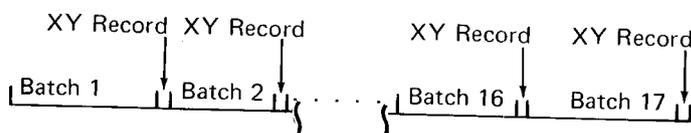
Note: If the 3741 file is the last one defined by RPG II file description specifications, the problem described here does not occur because the other files in the program are closed before the 3741 file is closed.

- At normal termination using write mode 4, System/3 sends an XZ record to the 3741, performs some other processing for several seconds, and then closes the file. The 3741 is offline when System/3 is attempting to close the file by sending the end-of-job signal. System/3 issues a not-ready halt, and you can respond with a 2 option to allow the System/3 program to continue.
- When the 3741 is the PUNCH, System/3 never sends the end-of-job signal to the 3741. Using write mode 4 for PUNCH operations causes job termination to occur without the wrong mode error on the 3741 and the not-ready halt or busy loop on System/3.

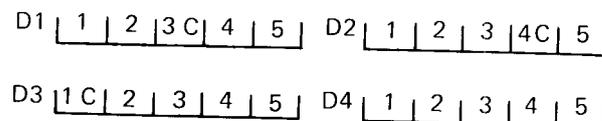
Examples

44 Write – Single Drive

Assume that the 3741 being used has one drive and that data for a single file is to be processed by an RPG II program (data management). The data is to be written on four diskettes (D1, D2, D3, and D4); each diskette contains five data sets; and there are 17 batches of data in the file to be written:



In the following diagram, the numbered segments are data set labels and C indicates there is a continuation byte in the MVI field of the label:



Prior to running the program, the user has inserted separator records in the data file to cause each batch to be written beginning in a new data set.

If the 3741 has only one drive, the following apply:

1. Check data set areas to ensure that all records can be contained within the respective areas. Check also that the record length specified for each data set is the same. Ready diskette D1.
2. Records are written into data set 1 on diskette D1 until an XY record is sent to the 3741. At that time, EOD and MVI fields are updated and records continue to be written into data sets 2, 3, and 4 with the label being updated after each data set. (The C in data set 3 is changed to a blank.)
3. When the fifth batch is written (one in each data set on diskette D1), a 10C1 error is posted to indicate that a new diskette must be inserted in drive 1. (System/3 does not issue a halt but appears to be in a busy loop.)
4. The cover is opened, the diskette is replaced, the cover is closed, and RESET is pressed.
5. Batches 6 through 10 are written into data sets 1 through 5 of diskette D2. Each time an XY record is received, it indicates the end of one batch and writing of the next batch continues with the next data set. The C in the label for data set 4 is changed to blank. Steps 3 and 4 are then repeated.
6. Batches 11 through 13 are written into data sets 1 through 3 of diskette D3 (XY records are received after each batch).
7. For batch 14, assume that EOE is reached before the XY record is received. (At setup time, the data set did not have sufficient capacity.) The diskette head returns to the index track, updates EOD, inserts a C in the MVI field, and posts a 10C1 error to indicate that a new diskette must be inserted. (Thus, data set 5 on diskette D3 is not used to contain batch 15, as originally planned.)
8. The cover is opened, diskette D3 is removed and diskette D4 is inserted, the cover is closed, and RESET is pressed.
9. The remainder of the records for batch 14 are written into data set 1 of diskette D4. The label for data set 1 will have L in the MVI field indicating that the batch (14) that was started on diskette D3 was completed on data set 1 of diskette D4. The XY record causes data set 2 to be used for batch 15. Batches 16 and 17 are written to data sets 3 and 4 on diskette D4.
10. When the XZ record is received by the 3741, the EOD field of the label for the last data set (data set 4) is updated, the 3741 returns to the index track, and the 3741 goes offline.

Note: When the 10C1 error is posted, you must change diskettes before pressing RESET. If the diskette is not changed when the cover is opened and closed, records are written in the data set identified by the first valid label on the same diskette.

44 Write – Two Drives

This example shows the use of the second disk drive on the 3741 to minimize the amount of operator intervention required. Differences from the preceding example are noted below:

1. Diskettes D1 and D2 are readied on drives 1 and 2, respectively.
2. When the XY record following batch 5 is received by the 3741, the EOD field of the label for data set 5 is updated, the MVI is made blank, and subsequent records are written into data set 1 of diskette D2.
3. While batches 6 through 10 are being written on diskette D2, diskette D1 is removed and diskette D3 is inserted into drive 1.
4. After batch 10 is written into data set 5 of diskette D2, batch 11 is written into data set 1 of diskette D3.
5. While batches 11 through 14 are being written into data sets 1 through 4 on diskette D3, diskette D2 is removed and diskette D4 is inserted into drive 2.
6. For batch 14, assume that EOE is reached before the XY record is received. (At setup time, the data set did not have sufficient capacity.) The diskette returns to the index track, updates EOD, inserts a C in the MVI field of the label, and writes the rest of the records for this batch into data set 1 of diskette D4. When the label for data set 1 of diskette D4 is updated, an L is written in the MVI field. Data set 5 on diskette D3 is not used to contain batch 15 as originally planned.

7. Batches 15 through 17 are written into data sets 2 through 4 of diskette D4.
8. The XZ record causes the label of the last data set (data set 4) to be updated and the 3741 goes offline.

Notes:

1. If processing is completed on drive 2 (or 1) and the cover has not been opened on the other drive, a 10C1 or 10C2 error is posted on the 3741. Following this situation, the next diskette to be processed must be in drive 1.
2. If, while processing drive 2 (or 1) the cover of the other drive is opened and closed, processing continues on the other drive at the data set identified by the first valid label. If a new diskette has not been inserted when the cover is opened and closed, the same data set may be processed again.
3. If a diskette is not ready on drive 2, a 10C1 error is indicated if drive 2 was not previously used; a 10C2 error is indicated if drive 2 was previously used. In either case, the next diskette to be processed must be on drive 1.

Chapter 5. Error Conditions

When the 3741 is online to the System/3, any error conditions that could occur are indicated in one of three ways:

- System/3 issues a halt or message.
- The 3741 posts an error code in the status line.
- System/3 issues a halt *and* the 3741 posts an error.

A blinking image on the 3741 display screen indicates that the 3741 detected an error. For this reason, the 3741 should be positioned so that you can be at the System/3 console and still see the 3741 display screen.

For a 3741 error that has no corresponding halt on the System/3, you correct the error on the 3741. Operation resumes without intervention at System/3.

System/3 Halts

Figure 17 lists the System/3 halts or messages that are related to the use of the 3741. Other halts are listed in the appropriate halt guide. (*See Halt Guides in Appendix A. Bibliography.*)

Error Condition	Options	System/3 Halts and Messages		
		Model 6	Models 8, 10, and 12	Model 15
The record length in the System/3 program is not between 1 and 128.	0, 3	DK C1 34	DK E7	DK E7 WL
The record length in the // FILE statement is greater than the record length in the System/3 program.	0, 3	Not applicable	Not applicable	DK E7 GT
The record length in the // FILE statement is not equal to the record length in the System/3 program.	0, 3	Not applicable	Not applicable	DK E7 NE
The record length in the System/3 program being executed under spool is less than 3.	0, 3	Not applicable	Not applicable	DK E7 SP
The 3741 is not ready.	1, 2, 3	IK CD 1245 01	IK 0Y 01	IK 0Y NR
The 3741 is in the wrong mode.	1, 2, 3	IK CD 1245 02	IK 0Y 02	IK 0Y WM
The 3741 has a parity error.	1, 2, 3	IK CD 1245 03	IK 0Y 03	IK 0Y PE
The 3741 has a record length error.	1, 2, 3	IK CD 1245 05	IK 0Y 05	IK 0Y RL

Figure 17. System/3 Halts and Messages

3741 Errors

Codes displayed in positions 5 through 8 of the status line (line 1 on the 3741 display screen) indicate errors that occur on the 3741. The 16xx error conditions that are displayed on the screen of the 3741 appear usually when the System/3 processing unit is stopped or when a 0Y halt is posted by the program level or partition that has the 3741 allocated. To recover from the 16xx error condition, start the processing unit or respond to the 0Y halt. This will change the 16xx error condition to a corresponding 10xx error code. Then use the appropriate recovery procedures for the 10xx error code.

Note: A 16xx error code may appear momentarily on the display screen even though the processing unit is executing instructions. This error code will automatically change to 10xx unless the processing unit is stopped or a 0Y halt is posted by the program level or partition that has the 3741 allocated.

See Figure 7 for a summary of the status line codes commonly encountered when the 3741 is online to the System/3. A blinking image on the 3741 display screen alerts you that attention is required.

Also included in the status line for online operations are:

Position	Explanation
37	I -- Writing to the 3741. O -- Reading from the 3741.
38	1, 2, 3, 4, 5 -- The mode selected by the operator.

The following 3741 error codes have corresponding System/3 halts:

3741 Error Codes	Error Condition
Positions 5 6 7 8	
1 A <i>b</i> <i>b</i>	Wrong mode (read or write). (1A <i>b</i> <i>b</i> 88 is displayed in positions 5 through 10 if mode 4 is used and an EOJ is received by the 3741 prior to an XZ record.)
1 B <i>b</i> <i>b</i>	Wrong length record (System/3 record length is less than 3741 record length).
1 C <i>b</i> <i>b</i>	Wrong length record (System/3 record length is greater than 3741 record length).

Note: *b* = blank position.

Figure 18 lists the 3741 error codes that have no corresponding System/3 halts.

3741 Error Code	Error Condition	Recovery
Positions 5 6 7 8 1 0 6 0	The diskette was removed during a seek operation to or from the index track.	<ol style="list-style-type: none"> 1. Insert a diskette. 2. Press NUM SHIFT and RESET.
1 0 0 1 1 0 0 2	The diskette was removed during the check for overlapping extents or the updating of data set labels or during data set processing. Position 8 indicates drive 1 or 2.	<ol style="list-style-type: none"> 1. Insert a diskette. 2. To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. 3. For 1002, press NUM SHIFT and RESET to continue on drive 1.
1 0 1 1 1 0 1 2	Length error; The actual record length is not as specified in the HDR1 label. Position 8 indicates drive 1 or 2.	To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET.
1 0 2 1 1 0 2 2	The diskette is defective. No record corresponding to the current disk address could be found. Position 8 indicates drive 1 or 2.	<ul style="list-style-type: none"> ● To skip the bad record, press NUM SHIFT and RESET. ● To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET.
1 0 3 1 1 0 3 2	Seek error; position 8 indicates drive 1 or 2.	<ul style="list-style-type: none"> ● To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. ● For 1032, press NUM SHIFT and RESET to continue on drive 1.
1 0 4 1 1 0 4 2	A read error occurred on the index track, or occurred when processing records in a data set. Position 8 indicates drive 1 or 2.	<ul style="list-style-type: none"> ● To continue with the next sector (bypass the sector causing the read error), press NUM SHIFT and RESET. ● To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET.
1 0 5 1 1 0 5 2	Write error on index track or when writing records into a data set. Position 8 indicates drive 1 or 2.	<ul style="list-style-type: none"> ● To continue with the next sector (bypass the sector causing the write error), press NUM SHIFT and RESET. ● To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET.

Figure 18 (Part 1 of 4). 3741 Error Codes Having No Corresponding System/3 Halts

3741 Error Code	Error Condition	Recovery
Positions 5 6 7 8		
1 0 A 1 1 0 A 2	The volume label or data set label is secured. Position 8 indicates drive 1 or 2.	Remove the diskette and insert another diskette in drive 1. <ul style="list-style-type: none"> • For modes 3, 4, or 5, press RESET to resume. • To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. • To return to the label to correct the problem, press RESET.
1 0 B 1	The data set label does not contain HDR1 in positions 1 through 4; or the data set label has a B in the bypass indicator.	<ul style="list-style-type: none"> • To ignore the error and continue processing the label, press ALPHA SHIFT and RESET. • To ignore the label and continue processing at the next valid label, press NUM SHIFT and RESET (mode 3, 4, or 5). • To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET.
1 0 C 1 1 0 C 2 (see Note)	This error code should occur only during multi-volume processing on a single- or dual-drive 3741. When switching from drive 1 to drive 2, drive 2 is not ready; or when switching from drive 2 to drive 1, the cover on drive 1 was not opened and closed since the last drive 1 operation.	<ul style="list-style-type: none"> • To retry, first change diskette, then press RESET. (Operation resumes on drive 1.) • If System/3 is reading from the 3741, pressing FUNCT SEL upper and then T terminates the data transfer. • To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. Taking the 3741 offline does not terminate the job.

Note: A 10C2 error indicates that drive 2 was expected to be ready, but was not. This error is posted only if:

- Drive 2 was previously used in the current job, and
- Either:
 - The cover of drive 2 has not been opened and closed, or
 - The cover of drive 2 is open.

Figure 18 (Part 2 of 4). 3741 Error Codes Having No Corresponding System/3 Halts

3741 Error Code	Error Condition	Recovery
<p>Positions</p> <p>5 6 7 8</p>		
1 0 E 1 1 0 E 2	EOE is reached while writing records on the 3741 using mode 1, 2, or 5. Position 8 indicates drive 1 or 2.	<ul style="list-style-type: none"> ● To continue processing: <ol style="list-style-type: none"> 1. Press RESET. 2. Position to another data set or modify the extent (EOE) of the current data set. 3. Place the 3741 online. ● To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET.
1 0 V 1 1 0 V 2	The volume label does not contain VOL1 in positions 1 through 4. Position 8 indicates drive 1 or 2.	<ul style="list-style-type: none"> ● To continue with the first valid data set label, press ALPHA SHIFT and RESET (or, if using mode 3, 4, or 5, you can press NUM SHIFT and RESET). ● To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET.
1 0 W 1 1 0 W 2	EOE is reached and, during the writing of that data set, a bad-spot record is written. There are one or more records in the 3741 buffer that cannot be written on the diskette. Position 8 indicates drive 1 or 2.	<ol style="list-style-type: none"> 1. To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. 2. Position to another data set. 3. Place the 3741 online. 4. Continue writing. Note that the records that are in the buffer when the error occurred are missing from the file.
1 0 X 1 1 0 X 2	The extents (BOE and EOE) of the current data set overlap the extents of another data set. Position 8 indicates drive 1 or 2.	<ul style="list-style-type: none"> ● To ignore the error and continue with the current label (all modes) press ALPHA SHIFT and RESET. ● To ignore the error and continue processing at the next valid label (mode 3, 4, or 5), press NUM SHIFT and RESET. ● To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET. ● To correct the error, change extents so that they do not overlap, then place the 3741 online.

Figure 18 (Part 3 of 4). 3741 Error Codes Having No Corresponding System/3 Halts

3741 Error Code Positions	Error Condition	Recovery
5 6 7 8		
1 0 Y 1 1 0 Y 2	The record length for a continued data set is not equal to the record length for the data set just processed. This error can occur when writing using mode 3, 4, or 5.	<ul style="list-style-type: none"> ● To retry, press RESET. (Operation resumes on drive 1.) ● If System/3 is reading from the 3741, pressing FUNCT SEL upper and T terminates the data transfer. ● To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET.
1 0 Z 6	The data set is closed and contains all records, but one or more bad-spot records are written. Position 8 is blank, but the operator can see which drive, 1 or 2, is affected.	<p>To take the 3741 offline, press any of the following:</p> <ul style="list-style-type: none"> ● RESET. ● ALPHA SHIFT. ● NUM SHIFT. ● ALPHA SHIFT, NUM SHIFT, and RESET (pressed simultaneously).
1 1 0 1	The diskette was removed and ALPHA SHIFT, NUM SHIFT, and RESET were pressed while the System/3 processing unit was stopped or a 0Y halt was posted.	<ol style="list-style-type: none"> 1. Insert diskette and close cover. 2. To take the 3741 offline, simultaneously press ALPHA SHIFT, NUM SHIFT, and RESET (all modes).

Figure 18 (Part 4 of 4). 3741 Error Codes Having No Corresponding System/3 Halts

Error Descriptions

3741 Not Ready

System/3 issues a not-ready halt when a System/3 program attempts to read records from or write records to the 3741 and finds that the 3741 is not online.

If you press NUM SHIFT and RESET, the record that caused the error is bypassed and the next record is read from the diskette. Before processing resumes, you should note the address of the record that caused the error. If read errors continue to occur, the valid data should be transferred to another diskette and the bad diskette should be discarded.

3741 Read Error

A read error occurs if the 3741 cannot (within ten tries) read a record from the diskette. The record causing the error is displayed on the 3741 display screen and the address of that record is displayed in the current address field of the status line (positions 25 through 29). System/3 does not issue a halt unless you take the 3741 offline to correct the error; instead, System/3 appears to be in a busy loop.

3741 Write Errors

If the 3741 cannot write a record on the diskette within ten tries, it attempts to write a bad-spot record. If the bad-spot record cannot be written within ten tries, a write error is posted and the record that caused the error is displayed on the 3741 display screen. (The current address field of the status line, positions 25 through 29 if drive 1 or positions 31 through 35 if drive 2, contains the address of the record that caused the write error.) System/3 does not issue a halt unless you take the 3741 offline to correct the error; instead, System/3 appears to be in a busy loop.

A bad-spot record is identified to the operator by an F in the first position of the record and to the 3741 by a special control address mark on the diskette. If the bad-spot record can be written on the diskette, the data record is written into the next sector and no error is displayed until end of job or EOE.

When a halt occurs because a bad-spot record cannot be written, press NUM SHIFT and RESET to cause the data record to be written into the next sector.

Wrong Mode Error

If System/3 is to write records on the 3741, you must press FUNCT SEL upper, then FIELD COR to place the 3741 in write mode; otherwise, both System/3 and the 3741 issue a wrong mode error. Similarly, if System/3 is to read records from the 3741, you must press FUNCT SEL upper, then DUP to place the 3741 in a read mode; otherwise, both System/3 and the 3741 issue a wrong mode error. The selected mode is shown in the status line as follows:

Position	Explanation
37	I – Writing to the 3741. O – Reading from the 3741.
38	1, 2, 3, 4, 5 – The mode the operator selects.

Record Length Error

Wrong length record is indicated to the 3741 if, on a read or write operation, the record length in the diskette label does not match the record length received or sent by System/3. System/3 issues a halt so that you can correct the error offline and resume operation.

In multiple data set operations, if the record length of a subsequent data set does not match the record length of the initial data set, System/3 issues the same halt (wrong length record).

Parity Error

The 3741 generates a parity bit for each byte it sends to System/3. If a parity error is discovered by the system, the attachment causes a halt to be issued (by System/3) with a cancel-only option, after three retries.

Overlapping Extents (Reading or Writing)

Each time the diskette head returns to the index track to locate the next data set label, a check is made for overlapping extents. If the next data set label defines a data set that has a BOE or EOE address that is within another data set, the 3741 posts an error and displays this other data set.

If the diskette head is positioned to a record within a data set prior to placing the 3741 online, no check is made on that data set for overlapping extents. For subsequent data sets that are used with modes 1, 2, 3, 4, or 5, the check for overlapping extents is made.

Note that when checking for overlapping extents, all labels are checked, even if they are coded as bypass, secure, or write-protected.

A wide range of examples is included in this chapter to assist you in planning your applications.

Note: Modes 3 and 4 are for special applications and are not considered in the examples.

Questions addressed are:

- Should I use a single data set or multiple data sets?
- What mode should I use?
- What do I need to be aware of?

The format for each example is:

Situation: A brief description identifies the situation in which you may want to use this application and what conditions exist, such as:

- Is the READER or PUNCH something other than the 3741?
- Is the program using data management to access data on the 3741?
- Is System/3 in HALT mode of operation? (In these examples, NOHALT is assumed if no reference is given.)
- What fields in the data set label should you check?

Content: Content shows sample OCL or data records used in the example.

Description: The example is discussed and specific points of interest are highlighted.

Summary of the Examples

Example Number	Read	Write	Single Data Set	Multiple Data Sets	Mode	Comments
1	X		X		1	Data set contains OCL without data.
2	X		X		1	Data set contains OCL and data.
3	X		X		1	Entire job stream on one data set.
4	X		X		1	OCL and data on same data set.
5	X		X		1	Job is spooled on 3741.
6	X			X	5	OCL and data in multiple data sets.
7	X			X	2	Spooled job stream with OCL and data on multiple data sets.
8		X	X		1	Job uses PUNCH.
9	X	X		X	1	Job uses PUNCH and READER.
10		X	X		1	Job uses data management.
11	X	X	X		1	Job uses PUNCH and READER.
12	X	X		X	1	Job uses data management.

EXAMPLE 1

Situation

- The function is to read a single data set that contains OCL without data.
- The READER is the 3741.
- Record length must be 96.
- System/3 is in HALT mode.
- The 3741 is positioned at data set 1 and placed online in mode 1.

Content

Data set 1:

```
// DATE 7/4/76
// LOG PRINTER
// LOAD PROGA,F1
    (PROGA does not access the 3741.)
// FILE NAME=FILEA,UNIT=R1,
    TRACKS=10,RETAIN=T,PACK=SCRACH
// RUN
    (EOD)
```

Description

PROGA executes when // RUN is read. The 3741 remains online but you can take it offline when PROGA is completed and System/3 issues an EJ halt. If you do not take the 3741 offline before responding to the EJ halt, the READER attempts to read another record but senses EOD instead; the 3741 then goes offline and the System/3 issues a not-ready halt. If you took the 3741 offline during execution of PROGA, System/3 issues a not-ready halt after you respond to the EJ halt. If, during execution of PROGA, you take the 3741 offline, position to another data set containing OCL, and place the 3741 online, then after you respond to the EJ halt, the OCL for the next job is read without further action.

EXAMPLE 2

Situation

- The function is to read a single data set that contains OCL and data records.
- The READER is the 3741.
- The user program uses data management to read records from the 3741.
- Record length must be 96.
- System/3 is in HALT mode.
- The 3741 is positioned at data set 2 and placed online in mode 1.

Content

Data set 2:

```
// LOAD PROGB,F1
    (PROGB reads records from the 3741 and writes
    them on the 5444.)
// FILE NAME=FILEB,UNIT=R2,
    PACK=PAYROL,TRACKS=50,LABEL=EMP
// RUN
R. O. SOLIE      123456
D. J. FELLMAN   999999
R. M. LARSON    987654
T. H. BLISS     654321
G. R. FORD      111111
H. OWL          000000
C. LAFEMME     345123
    (EOD)
```

Description

When // RUN is read, PROGB executes and begins reading from the 3741 (using data management). PROGB reads R. O. SOLIE through C. LAFEMME. When EOD is reached, the 3741 goes offline; PROGB detects end of file and terminates. (System/3 issues an EJ halt.) Before you respond to the EJ message, you should place the 3741 online and position at another data set containing more OCL (otherwise, System/3 issues a not-ready halt).

If, in this example, you want the data records to be other than 96 bytes, have the OCL in one data set (as in *Example 1*) and the data records in another data set (data set 3) that has a different record length specified. Place the 3741 online in mode 2 and position to data set 2. After reading the // RUN statement, the 3741 returns to the index track at the label for data set 2. Since you are in mode 2, the 3741 remains online and you can position to data set 3 (data set 3 can be on same diskette or on another diskette). Select mode 1 and PROGB reads the data records and terminates the same as the first way of handling example 2. The advantage of using mode 2 to read the OCL is that System/3 does not issue a halt after the // RUN statement; therefore, you do not have to move back and forth between the 3741 and System/3.

Another way of doing the example is to specify some other device (such as MFCU) as the READER. Then OCL is read from the READER and the data set on the 3741 contains data records only. Position the diskette head to data set 3, which contains only data records, and place the 3741 online in mode 1.

EXAMPLE 3

Situation

- The function is to read a single data set that contains an entire jobstream (data and OCL).
- The READER is the 3741.
- Record length must be 96 because OCL is in the data set.
- The user program uses data management to read records from the 3741.
- The 3741 is positioned at data set 4 and placed online in mode 1.

Content

Data set 4:

```
// DATE 7/4/76
// LOG CONSOLE
// LOAD PROGA,F1
    (PROGA accesses the 3741.)
// FILE NAME=FILEA,UNIT-R1,
    TRACKS=10,PACK=SCRACH
// RUN
R. O. SOLIE      123456
P. POSSUM       789ABC
F. STOP         481622
E. NUFF         RRRRRR
H. OWL          000000
/*
// LOAD $MAINT,F1
// RUN
// COPY FROM-READER,TO-F1,
    LIBRARY-P,RETAIN-R,NAME-PROC1
// CALL PROC2,F1
// CALL PROC3,F1
// CEND
// COPY FROM-READER,TO-F1,
    LIBRARY-P,RETAIN-R,NAME-PROC2
// LOAD PROGC,F1
    (PROGC reads 96-byte data from 3741.)
// RUN
// CEND
// COPY FROM-READER,TO-F1,
    LIBRARY-P,RETAIN-R,NAME-PROC3
// LOAD PROGD,F1
    (PROGD reads 96-byte data from 3741.)
// RUN
// CEND
// END
    (EOD)
```

Description

The entire job stream is on one data set on the 3741. Note the similarity to a job stream on a card reader. After EOD and when \$MAINT terminates, System/3 issues a not-ready halt when it attempts to read the next OCL record after end of job.

EXAMPLE 4

Situation

- The function is to read the OCL to call a procedure and the data for the programs that are run in the procedure both from the same data set.
- The READER is the 3741.
- Record length must be 96.
- The 3741 is positioned at data set 5 and placed online in mode 1.
- The user program uses data management to read records from the 3741.

Content

Data set 5:

```
// CALL PROC1,F1
// RUN
DATA FOR PROGC 1
DATA FOR PROGC 2
/*
DATA FOR PROGD 1
DATA FOR PROGD 2
DATA FOR PROGD 3
      (EOD)
```

Description

OCL to call a procedure is placed on the same data set that contains the data for the programs that are run in the procedure. After EOD and when PROGD terminates, System/3 issues a not-ready halt when it attempts to read the next OCL record after end of job. PROC1 was placed in the library in *Example 3*.

EXAMPLE 5

Situation

- The function is to read a spooled job stream from a single data set on the 3741 using a System/3 Model 15.
- The 3741 is the READER and spooled reader.
- Record length must be large enough to contain the longest record, but pool will expand or truncate data records to fit the program's request.
- When the jobs are executed, pool will expand or truncate the OCL and control statements to 96 bytes.

- The 3741 is positioned at data set 6 and placed online in mode 1.
- The START RDR command is entered on the Model 15 keyboard.
- The user program uses data management to read records from the 3741.

Content

Data set 6:

```
//JOB1 JOB
//STEP A LOAD PROGA,F1
// FILE NAME=FILEA,UNIT=R1,
      TRACKS=10,RETAIN=T,PACK=SCRACH
// RUN
//STEP B LOAD PROGB,F1
// FILE NAME=FILEB,UNIT=R1,
      PACK=PAYROL,TRACKS=50,LABEL=EMP
R. O. SOLIE      123456
D. J. FELLMAN   999999
R. M. LARSON    987654
T. H. BLISS     654321
G. R. FORD      111111
H. OWL          000000
C. LAFEMME      345123
/*
/.
//JOB2 JOB
//STEP A CALL PROC1,F1
// RUN
DATA FOR PROGC 1
DATA FOR PROGC 2
/*
DATA FOR PROGD 1
DATA FOR PROGD 2
DATA FOR PROGD 3
/*
/.
/.
      (EOD)
```

Description

When the second consecutive /. statement is read, the input spooling routine terminates and the job stream from data set 6 is in the reader queue. Another START RDR command causes System/3 to issue a 3741 not-ready message.

You can start partition 1 when it has the 3741 assigned as READER; the spooled job stream is read from the RDRQ and those jobs are executed.

EXAMPLE 6

Situation

- The function is to read OCL and data records from multiple data sets.
- The READER is the 3741 and System/3 is a Model 10.
- OCL for two separate programs is on two separate data sets (data sets 1 and 2).
- Data for the second program is on two data sets on two diskettes (data sets 3 and 4).
- The 3741 is positioned at data set 1 and placed online in mode 5.

Content

Data set 1:

```
// NOHALT
// LOAD PROGE,R1
// FILE NAME=INPUT,UNIT=R2,
//   PACK=R2R2R2,LABEL=SALES
// RUN
//   (EOD)
```

Description

Because System/3 is in NOHALT mode, it tries to read OCL for the next program as soon as PROGE terminates. The 3741 returns to the index track, locates the next data set label (for data set 2) and begins reading data set 2.

Content

Data set 2:

```
// HALT
// LOAD $COPY,F1
// FILE NAME=COPYO,UNIT=R2,
//   PACK=R2R2R2,TRACKS=4,RETAIN=T,
//   LABEL=TRANS
// RUN
// COPYFILE OUTPUT=DISK,INPUT=3741,
//   LENGTH=96
// END
//   (EOD)
```

Description

When \$COPY begins to execute, the 3741 returns to the index track, locates the next data set label (for data set 3), and begins reading data set 3 using data management. (The label for data set 3 is the last valid data set label on this diskette.)

Content

Data set 3:

```
TRANSACTION RECORD 1
TRANSACTION RECORD 2
TRANSACTION RECORD 3
      .
      .
      .
TRANSACTION RECORD n
      (EOD)
```

Description

When EOD is reached on data set 3, the 3741 returns to the index track, finds no more valid data set labels on this diskette, and posts a 10C1 error. System/3 is in a busy loop. Remove this diskette and insert the diskette containing data set 4. The label for data set 4 is the first and only valid data set label on the diskette. Press RESET. The 3741 begins reading data set 4.

Content

Data set 4:

```
TRANSACTION RECORD n+1
TRANSACTION RECORD n+2
      .
      .
      .
TRANSACTION RECORD n+n
      (EOD)
```

Description

When EOD is reached for data set 4, the 3741 finds no more valid data set labels on the diskette and posts a 10C1 error. Since you know that data set 4 is the last batch of transactions for this job, press FUNCT SEL upper, then T to signal end of file. \$COPY terminates and System/3 halts at end of job.

EXAMPLE 7

Situation

- The function is to read a spooled job stream with OCL and data on multiple data sets.
- The READER and the spooled input device is the 3741.
- Data for PROGX was keyed offline on another 3741 on three separate diskettes.
- Diskette record length must be large enough to contain the longest record. Records are expanded or truncated by spool to the record length requested by the executing program.
- Record length for all records is 96.
- System/3 is a Model 15.
- The 3741 is positioned at data set 1 and placed online in mode 2.
- Enter a START RDR command on the Model 15 keyboard.

Content

Data set 1 on diskette A:

```
//JOB1 JOB
//STEP1 LOAD PROGX,F1
// FILE NAME-INPUT,UNIT-3741
// FILE NAME-FILEX,UNIT-R1,
  TRACKS-40,RETAIN-T,PACK-DATA
// RUN
  (EOD)
```

Description

At EOD, the 3741 returns to the index track and System/3 is in a wait state. Place the first of the three data diskettes in the 3741. Position to the label for data set 2 and place the 3741 back online in mode 2.

Content

Data set 2 on diskette B:

```
TRANSACTION RECORD 1
TRANSACTION RECORD 2
      .
      .
      .
      .
TRANSACTION RECORD 1898
  (EOD)
```

Description

The same actions occur as at the last EOD. Insert diskette C.

Content

Data set 3 on diskette C:

```
TRANSACTION RECORD 1899
TRANSACTION RECORD 1900
      .
      .
      .
      .
TRANSACTION RECORD 3796
  (EOD)
```

Description

The same actions occur as at the last two EODs.

Content

Data set 4 on diskette D:

```
TRANSACTION RECORD 3797
TRANSACTION RECORD 3798
      .
      .
      .
TRANSACTION RECORD 5000
      (EOD)
```

Description

At EOD, there are no more transactions, so you must inform the spooled reader that end of file is reached. When the data is keyed offline, the key-entry operators do not know which batch of transactions are the last batch and therefore do not know where to put a /* to indicate end of file.

You can solve this situation by putting a /. preceding the next OCL data set. Position the 3741 at data set 5 and place online in mode 2.

Content

Data set 5 on diskette A:

```
/*
/.
//JOB2 JOB
//STEP1 LOAD PROGY,F1
// RUN
/.
/.
      (EOD)
```

Description

When the second consecutive /. statement is read, the input spooling routine terminates and the job stream in data sets 1 through 5 is in the RDRQ. Another START RDR command causes System/3 to remain in a wait state (because the 3741 is in mode 2) until you place another OCL data set online. You can start partition 1 when it has the 3741 assigned as READER; the spooled job stream is then read from the RDRQ and those jobs execute.

EXAMPLE 8

Situation

- The function is to write to a single data set using PUNCH.
- The READER is MFCU1.
- The PUNCH is the 3741.
- The 3741 is positioned at data set 1 and placed online in mode 1.
- System/3 is in HALT mode.

Content

Cards in MFCU1:

```
// HALT
// PUNCH 3741
// LOAD $MAINT,F1
// RUN
// COPY FROM-F1,TO-PUNCH,
// LIBRARY-P,NAME-PROC1
// COPY FROM-F1,TO-PUNCH,
// LIBRARY-O,NAME-PROGC
// END
```

The following is written into data set 1:

```
// COPY FROM-READER,LIBRARY-P,
// RETAIN-P,NAME-PROC1,TO-
// CALL PROC2,F1
// CALL PROC3,F1
// CEND
// COPY FROM-READER,LIBRARY-O,
// RETAIN-P,NAME-PROGC,TO-
      .
      .
      .
      (PROGC object program)
      .
      .
      .
// CEND
```

Description

After the // END card is read, \$MAINT terminates and System/3 issues an EJ halt. Before removing the diskette or positioning to another data set, you must close out data set 1 by pressing FUNCT SEL upper, then T.

EXAMPLE 9

Situation

- The function is to read and write to separate data sets on the 3741.
- The 3741 is the READER and the PUNCH.
- The 3741 is positioned at data set 1, and placed online in read mode 1.

Content

Data set 1:

```
// PUNCH 3741
// LOAD $MAINT,F1
// RUN
// COPY FROM-F1,TO-PUNCH,
  LIBRARY-R,NAME-$$CPIP
// COPY FROM-F1,TO-PUNCH,
  LIBRARY-R,NAME-$$CPOP
// END
  (EOD)
```

Description

After the first // COPY statement is read, \$MAINT tries to punch, but the 3741 is in read mode. System/3 issues a wrong mode halt. You must take the 3741 offline, position the diskette head to data set 2 and place the 3741 back online in write mode 1, then respond to the System/3 halt. \$MAINT then begins writing into data set 2.

Content

Data set 2:

```
// COPY FROM-READER,LIBRARY-R,
  RETAIN-P,NAME-$$CPIP,TO-
  .
  .
  .
  ($$CPIP routine)
  .
  .
  .
// CEND
```

Description

After the // CEND statement is written, System/3 issues a wrong mode halt because \$MAINT is trying to read the next control statement but the 3741 is in write mode. You must take the 3741 offline by pressing RESET, FUNCT SEL upper, then T to prevent losing records on data set 2 and to cause EOD to be updated in the label. You then find the label for data set 1, press FUNCT SEL lower, then UPDATE. Then press REC ADV until the next control statement for \$MAINT is found. Place the 3741 online in read mode 1. When you respond to the wrong mode halt, the next control statement is read. System/3 issues another wrong mode halt as \$MAINT tries to write \$\$CPOP into data set 3. You must take the 3741 offline, position the diskette head to data set 3, and place the 3741 back online in write mode 1; then respond to the System/3 halt. \$MAINT then begins writing into data set 3.

Content

Data set 3:

```
// COPY FROM-READER,LIBRARY-R,
  RETAIN-P,NAME-$$CPOP,TO-
  .
  .
  .
  ($$CPOP routine)
  .
  .
  .
// CEND
```

Description

Once again System/3 issues a wrong mode halt after the // CEND statement is written. Take the 3741 offline by pressing RESET, FUNCT SEL upper, then T. Continue as after writing into data set 2.

EXAMPLE 10

Situation

- The function is to write to a single data set using data management.
- The READER is the 3277.
- Record length for the data set on the 3741 must be 96.
- System/3 is the Model 15.
- The 3741 is placed online in write mode 1.

Content

OCL statements entered on the keyboard:

```
// LOAD $COPY,F1
// FILE NAME-COPYIN,UNIT-2501
// FILE NAME-COPYO,UNIT-3741,
  RECL-96
// RUN
// COPYFILE OUTPUT-FILE
// END
```

Cards in the 2501:

```
01010H016P 016                                PROGA
01020FINPUT   IP  F  96  96                    MFCU1
01030FOUTPUT  O  F  96  96                    DISKET
01040FPRTOUT  O  F      132                   PRINTER
010501INPUT   01
010551
010600OUTPUT  D                                1  96  FIELDA
010700
010800PRTOUT  D                                FIELDA  96
010900
/*                                FIELDA  96
```

Records written on the diskette:

```
01010H016P 016                                PROGA
01020FINPUT   IP  F  96  96                    MFCU1
01030FOUTPUT  O  F  96  96                    DISKET
01040FPRTOUT  O  F      132                   PRINTER
010501INPUT   01
010551
010600OUTPUT  D                                1  96  FIELDA
010700
010800PRTOUT  D                                FIELDA  96
010900
                                FIELDA  96
```

Description

When the last record is written, the 3741 goes offline and the EOD in the data set label is updated.

EXAMPLE 11

Situation

- The function is to read and write to a single data set using READER and PUNCH.
- The 3741 is the READER and the PUNCH.
- Record length must be 96.
- The 3741 is positioned at data set 1 and placed online in mode 1.

Content

Data set 1:

```
// PUNCH 3741
// CALL RPG,F1
// RUN
```

```
01010H016P 016
01020FINPUT IP F 96 96 MFCU1
01030FOUTPUT O F 96 96 DISKET
01040FPRTOUT O F 132 PRINTER
010501INPUT 01
010551
010600OUTPUT D 1 96 FIELDA
010700 FIELDA 96
010800PRTOUT D
010900 FIELDA 96
/*
```

Description

System/3 issues a halt so that you can position the diskette head on data set 2. Place the 3741 online and position on data set 2 in mode 1 write.

Content

Data set 2:

```
// COPY FROM-READER,LIBRARY-O,
// RETAIN-T,TO-ØØ,NAME-PROGA
.
.
.
(object deck for PROGA)
.
.
.
// CEND
```

Description

When the RPG II compiler terminates, the System/3 issues a wrong mode halt because the 3741 is in write mode and System/3 is trying to read the next OCL statement.

You must take the 3741 offline by pressing FUNCT SEL upper, then T to ensure that all the records are written and the label is updated for data set 2.

EXAMPLE 12

Situation

- The function is to read and write to multiple data sets using data management.
- The 3741 is the READER.
- Record length is 96.
- The 3741 is positioned at data set 1 and placed online in mode 1.

Content

Data set 1:

```
// LOAD *
// RUN
(Object deck for PROGA as written in Example 11 except
that the // COPY and // CEND statements must be deleted.)
/*
    (EOD)
```

Cards on MFCU1:

```
RECORD 1
RECORD 2
RECORD 3
    .
    .
    .
RECORD 3000
/*
```

Description

When EOD is reached on data set 1, place the 3741 online in write mode 1. Use an empty diskette with one data set label (data set 2) with BOE = 01001 and EOE = 73026. When PROGA executes, it reads cards from MFCU1 and writes them on data set 2.

Content

Data set 2:

```
RECORD 1
RECORD 2
    .
    .
    .
RECORD 1898
    (EOE)
```

Description

When you reach EOE, the data set label is updated and the 3741 posts a 10E1 error. Insert another empty diskette with one data set label (data set 3) just as you did for data set 2. Press RESET.

Content

Data set 3:

```
RECORD 1899
    .
    .
    .
RECORD 3000
```

Description

PROGA terminates. The 3741 goes offline and EOD is updated for data set 3. System/3 issues a not-ready halt because the 3741 is offline and System/3 is trying to read the next OCL statement.

Appendix A. Bibliography

SYSTEM/3 PUBLICATIONS

Related Publications	Model 6	Models 8 and 10	Model 12	Model 15
Introduction	GA21-9122	GC21-5114 (Model 8) GC21-7510 (Model 10)	GC21-5116	GC21-5094
SCP Reference	GC21-7516	GC21-7512	GC21-5130	GC21-5077 (5704-SC1) GC21-5162 (5704-SC2)
Users Guides			GC21-5142	GC21-7632
System Generation		GC21-5126		GC21-7616
Overlay Linkage Editor		GC21-7561		
Macros		GC21-7562		GC21-7608
System Operators Guide	GC21-7501	GC21-7634 (Model 8) GC21-7508 (Model 10)	GC21-5144	GC21-5075
Halt/Message Guide	GC21-7541	GC21-7540	GC21-5145	GC21-5076
MRJE/WS Reference		GC21-7621		GC21-5115
Disk Concepts/Reference		GC21-7571		GC21-7571 GC21-5111
Components Reference	GA34-0001	GA21-9236		
Installation Manual		GA21-9084		
Basic Assembler		SC21-7509		
COBOL		GC28-6452		
DATA/3		SC21-5102		
Disk Sort		SC21-7522		
FORTRAN Reference Commercial Subroutines		SC28-6874 SC28-6875		
RPG II Reference Auto Report	SC21-7517	SC21-7504 SC21-5057		

3740 SYSTEM PUBLICATIONS

IBM 3741 Data Station Operator's Guide, GA21-9131.

IBM 3740 Data Entry System – System Summary and Installation Manual – Physical Planning, GA21-9152.

The IBM Diskette for Standard Data Interchange, GA21-9182.

IBM 3741 Data Station Reference Manual, GA21-9183.

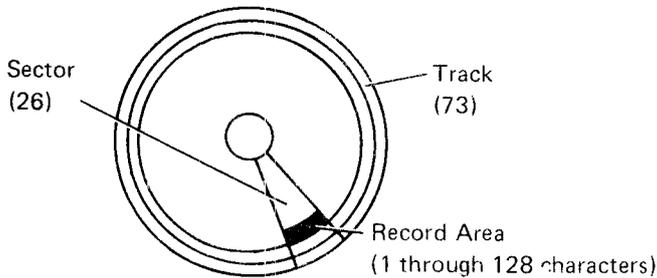
IBM 3741 Models 3 and 4 Programmable Work Station Programming reference Manual, GA21-9194.

IBM 3741 Models 3 and 4 Programmable Work Station General Information, GA21-9196.

Appendix B. Layout of Diskette

THE IBM DISKETTE

The IBM Diskette is divided into 26 wedge-shaped sectors and 73 tracks that are available for user data (1898 record areas identifiable by track-sector addresses):



Track 00, the index track label, is described later in this appendix. A program used by a 3741 directly attached to a System/3 requires fixed length records (any specified length between 1 and 128 characters).

INDEX TRACK (TRACK 00) LABEL

Only information pertinent to the 3741 directly attached to a System/3 is included. For a complete description of the label contents, see *The IBM Diskette for Standard Data Interchange*, GA21-9182.

Sector and Position

Description

**Entry:
Required,
Optional, or
not Applicable**

01-04	Reserved.	
05		
1-13	Used to record the identity of error tracks.	
1-5	ERMAP. This entry means the sector is an error map.	
7, 8	Used to identify a bad track. If two tracks are bad, the lower-numbered bad track is identified. If there are no bad tracks identified, entry is \emptyset .	
9	\emptyset entry means no bad track identified in this field. 0 entry means one or more bad tracks identified.	
10	Reserved.	
11, 12	Number of the higher-numbered bad track when two bad tracks are identified. \emptyset when only one or no bad tracks identified.	
13	\emptyset if one bad track or none. 0 if two bad tracks.	
14-22	Reserved.	
23	Defect flag position, normally initialized to \emptyset . D in this position indicates that the 3540 has detected a surface defect in the data field of any sector of any track.	

Sector and Position	Description	Entry: Required, Optional, or not Applicable
06	Reserved.	
07	Volume label. Sector fields identify the diskette, the diskette format, diskette owner identification, and whether or not the diskette uses standard labels.	
1-4	VOL1 means sector is a volume label.	
5-10	Volume ID field. This field can contain the data written on the permanent diskette label to identify the diskette. The ID consists of one to six numeric digits or letters. These characters must be left-justified in the field (that is, the first character must be in position 5 of the sector), and any unused positions in the field to the right of the ID data must contain space characters (blanks). No blanks are allowed between digits or letters in this field.	
11	Volume accessibility field. \emptyset entry permits access to the disk. Any nonblank character in this field means that the disk is not accessible or has restricted access per system definition.	
12-37	Reserved.	
38-51	Owner ID field (not used by all systems).	
52-76	Reserved.	
77, 78	Record sequence field. This field holds the sector sequence code assigned to the tracks on this diskette. Use of this field can affect performance of the 3741 when online to System/3 and is therefore not recommended.	
79	Reserved.	
80	Standard label version field. This field should contain a W indicating use of standard labels.	
08-26	These sectors are used to record the data set labels that define data sets (files of information) recorded on tracks 01 through 73 of the diskette. Data in any one of the sectors is as follows:	
1-4	Label ID; must be HDR1.	Required
5	Reserved.	
6-13	Data set name (user name for data set).	Optional
14-22	Reserved.	
23-27	Block/record length. Entry of 1 through 128 tells the system how much of each 128 position sector contains actual data. (Each sector-track position can contain one logical record. The record length must be right justified.)	Required

Sector and Position	Description	Entry: Required, Optional, or not Applicable
08-26 (cont)		
28	Reserved.	
29-33	BOE. Address of the first sector of the data set is identified as follows: track number in positions 29 and 30; 0 in position 31; sector number in positions 32 and 33.	Required
34	Reserved.	
35-39	EOE. Address of the last sector reserved for this data set is in the same format as BOE.	Required
40	Reserved.	
41	Bypass indicator. <i>∅</i> entry indicates data set is intended for processing. B entry indicates data set is not intended for processing even though it resides on the disk. That is, a 3741 or 3742 user could store 3741 or 3742 programs on a diskette (identified with B in the label) as well as data (identified with <i>∅</i> in the label), and neither a 3747 nor a 3540 would read the programs. Also, a data set identified with a B in this position would not be transmitted by a 3741 Model 2 or Model 4 operating in teleprocessing transmit mode.	Required (blank or B)
42	Data set security. <i>∅</i> entry indicates data set not secured (can be accessed). A non-blank character (which can be written only by the 3540) means restricted access. When set to nonblank, the volume accessibility indicator must also be set to non-blank. The data cannot be read by 3741, 3742, 3747, but can be read by 3540 with operator qualification. The data set cannot be written upon, and the volume accessibility indicator cannot be changed from nonblank by the 3741, 3742, or 3747, or by 3540 programming support.	Optional
43	Write protect. <i>∅</i> entry allows both reading and writing. P entry indicates data set can be read only.	Not applicable for reading; required (blank or P) for writing
44	Interchange type indicator. <i>∅</i> entry required indicating the data set can be used for data interchange.	
45	Multivolume indicator. <i>∅</i> entry indicates entire data set is on this diskette. C entry indicates data set is continued to another diskette. L entry indicates last diskette on which a continued data set resides.	Required (blank, C, or L for modes 3, 4, and 5)
46-47	Volume sequence number. Volume sequence specifies the sequence of volumes in a multivolume data set. The sequence must be consecutive, beginning with 01 (to a maximum of 99). <i>∅</i> entry indicates that volume sequence checking is not to be performed.	Not applicable
48-53	Creation date. May be used to record the date the data set was created. The format is digits representing YYMMDD, where YY is low-order two-digits of year, MM is two-digit representation of month, and DD is two-digit representation of day of the month.	Not applicable

Sector and Position	Description	Entry: Required, Optional, or not Applicable
08-26 (cont)		
54-66	Reserved.	
67-72	Expiration date. Can be used to contain the date that the data set (and its label) can be purged. The format is as specified for creation date.	Not applicable
73	Verify mark. This field must contain a V or a blank. V indicates the data set is verified.	
74	Reserved.	Not applicable
75-79	EOD. Address of the next unused sector within the data set extent is in the same format as BOE.	
80	Reserved.	Required

Appendix C. Valid 3741 Characters

The following characters are generated from the 3741 keyboard. Hex values 00-FF may be generated in the System/3 and written to or read from the 3741 diskette.

Character	Corresponding Hexadecimal Number
Blank	40
¢	4A
. (period)	4B
<	4C
(4D
+	4E
	4F
£	50
!	5A
\$	5B
*	5C
)	5D
;	5E
⌋	5F
- (minus)	60
/	61
, (comma)	6B
%	6C
_ (underscore)	6D
>	6E
?	6F
:	7A
#	7B
@	7C
' (apostrophe)	7D
=	7E
”	7F
A	C1
B	C2
C	C3
D	C4
E	C5
F	C6
G	C7
H	C8
I	C9
J	D1
K	D2
L	D3
M	D4
N	D5
O	D6
P	D7
Q	D8
R	D9
\	E0
S	E2
T	E3
U	E4
V	E5
W	E6
X	E7
Y	E8
Z	E9
0	F0
1	F1
2	F2
3	F3
4	F4
5	F5
6	F6
7	F7
8	F8
9	F9

The list includes all possible positions in which an entry can appear; however, not all these positions contain entries at a given time.

1 3 7 8 9 10 12 17 20 25 29 31 35 37 38 39 40
 • • • • • • • • • • • •

Positions	Entry	Description
1-3	Cursor position	Indicates your current position in the record.
5-10	Error codes:	See <i>Chapter 5. Error Conditions</i> .
5-6	I/O adapter	
7	Functional	
8	Diskette	
9-10	I/O adapter	
12	Program number	Indicates the program storage area you are currently using.
17	Begin field code	Shows the begin field character for the current field of your program.
20	Program shift code	Shows the program shift (alpha or numeric) for the current position. A = alpha shift, N = numeric shift.
25-29	Diskette 1 address	The first two digits represent the track you are using; the middle digit must be zero; the last two digits are the sector.

Positions	Entry	Description
31-35	Diskette 2 address	Address of the diskette on the second diskette drive.
37	Online status	O = Read; I = Write.
38	Machine mode	Indicates the machine mode. Commonly used modes are: C = Field correct. E = Enter. M = Modify index. S = Search. U = Update. V = Verify. X = Read index. 1, 2, 3, 4, or 5 = Mode number.
39	Alternate record address	Indicates the 3741 is in a mode that bypasses all fields beyond the cursor position when you press REC ADV in enter mode.
40	Machine status	Codes are: N = Not ready (diskette is not loaded). R = Ready. W = Wait.

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