

5280



SC21-7788-4
S5280-32

IBM 5280 Distributed Data System

Utilities Reference/Operation Manual

Program Number 5708-UT1



SC21-7788-4
S5280-32

IBM 5280 Distributed Data System

Utilities Reference/ Operation Manual

Program Number 5708-UT1

Fifth Edition (April 1983)

This major revision obsoletes, SC21-7788-3. Changes or additions are indicated by a vertical line to the left of the change. Major changes are:

- SYSPRINT supports hexadecimal print
- SYSBROWS adds functions to the command line
- SYSMENU allows multiple menu data sets on one device
- SYSMCU allows multiple menu data sets and prints the menu data sets
- SYSRAU allows changes to the maximum disk allocation table
- SYSSTAT displays the maximum disk allocation table values
- General changes for disk support.

This edition applies to release 7, modification 0 of the IBM 5280 Utilities Program Product (Program 5708-UT1) and to all subsequent releases and modifications until otherwise indicated in new editions or Technical Newsletters. Changes are made periodically to the information herein; changes will be reported in Technical Newsletters or in new editions of this publication.

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM program product in this publication is not intended to state or imply that only IBM's program product may be used. Any functionally equivalent program may be used instead.

This publication contains examples of data and reports used in daily business operation. 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.

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.

A form for reader's comments is provided at the back of this publication. If the form has been removed, comments may be addressed to IBM Corporation, Information Design and Development, Department 997, 11400 Burnet Road, Austin, Texas 78758. IBM may use and distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

© Copyright International Business Machines Corporation 1980, 1981, 1982, 1983

PREFACE

This manual is intended for operators familiar with the IBM 5280 system and programmers who use the IBM 5280 utilities. The manual discusses the loading of the utilities, their use, and the user's interaction with the system. Each chapter, except chapter one, is arranged to provide a step-by-step explanation of the operation of each utility. For this reason, it is important to read the each chapter in sequence. For information about communication utilities, see the IBM 5280 Communications Utilities Reference Manual.

PREREQUISITE PUBLICATION

Before reading this manual you should read the IBM 5280 System Control Programming Reference/Operation Manual, GC21-7824.

RELATED PUBLICATIONS

Publications containing information related to this manual are:

- IBM 5280 Operator's Guide, GA21-9364
- IBM 5280 Sort/Merge Reference/Operation Manual, SC21-7789
- IBM 5280 Communications Utilities Reference Manual, SC34-0247
- IBM 5280 System Concepts, GA21-9352
- IBM Diskette General Information Manual, GA21-9182
- IBM 5280 Message Manual, GA21-9354
- IBM 5280 Procedure Control Language Reference Manual, SC23-0706.

HOW TO USE THIS MANUAL

This manual contains 16 chapters and an appendix.

Chapter 1 introduces the utilities and explains some common concepts used by the utilities.

Chapters 2 through 16 discuss each utility program individually. A step-by-step explanation of the operation of each utility is provided with examples of prompting messages as they appear in an actual operation. Possible response choices are listed after each prompt and explained in detail (if necessary).

The appendix contains the language/keyboard chart used during system configuration; this chart is used in conjunction with the system status utility.

CONTENTS

Chapter 1. Introduction to the IBM 5280 Utilities	1-1
Contents of the Utilities Diskette	1-1
The Key Entry Utility (SYSKEU)	1-2
The Label Maintenance Utility (SYSLABEL)	1-2
The Label List Utility (SYSLIST)	1-3
The Copy Utility (SYSCOPY)	1-4
The Print Utility (SYSPRINT)	1-4
The Clear Utility (SYSCLEAR)	1-5
The Initialization Utility (SYSINIT)	1-5
The Resource Allocation Utility (SYSRAU)	1-5
The System Status Utility (SYSSTAT)	1-6
The Compress Utility (SYSCOMP)	1-6
The IBM 3740 Format Conversion Utility (SYS3740C)	1-7
The Standard Character Set/Binary Synchronous Communications IBM 3741 Print Utility (SYSCPRNT)	1-7
The Data Set Display Utility (SYSBROWS)	1-8
The Menu Utility (SYSMENU)	1-8
The Menu Configuration Utility (SYSMCU)	1-8
Display Prompts	1-9
Variable Fields	1-9
Prompt Numbers	1-10
The Status Line	1-10
The Load Prompt	1-11
The Diskette Volume-Protected Prompt	1-12
The Disk Volume-Protected Prompt	1-13
The Disk Data Set-Protected Prompt	1-14
Group Data Set Qualifier Processing	1-15
The Utility-Completed Prompt	1-16
The Utility-Terminated Prompt	1-17
Terminating the Utility Using the Cmd, End-of-Job Key Sequence	1-17
How to Use Data Sets	1-18
How to Use Diskettes	1-18
Diskette Types	1-18
Diskette Layout	1-18
Diskette Format	1-19
The Diskette Index Cylinder	1-19
Exchange Types	1-20
Deleting Records	1-20
Allocating the Data Set	1-21
Deleting a Data Set	1-21
How to Use Disks	1-22
Disk Layout and Format	1-22
Disk Index Cylinder	1-22
Chapter 2. The Key Entry Utility (SYSKEU)	2-1
Modes of Operation	2-2
Enter Mode	2-3
Update Mode	2-3

Verify Mode	2-4
Keyboard Shifts	2-6
Alphabetic Shift	2-6
Numeric Shift	2-6
The Key Entry Utility Status Line	2-7
Operation of the Key Entry Utility	2-10
Load the Key Entry Utility (05-00)	2-10
Select the Mode of Operation (06-81)	2-11
Enter Data for Data Set Open (06-82)	2-12
Data Set Open Failed (06-83)	2-13
Allocate Data Set Space (06-84)	2-14
Data Entry Operation	2-15
Ending a Data Entry Job (06-89)	2-16
Select Statistics (06-90)	2-17
Exiting the Key Entry Utility	2-17
Formats	2-18
The Number of Formats You Can Use	2-19
Creating a Format	2-20
Saving Formats	2-21
Loading a Format From a Data Set	2-22
Selecting a Format	2-23
Displaying or Changing a Format	2-23
How to Define a Record Format	2-24
Field Definition Characters	2-27
Field Continuation Characters	2-28
End-of-Format Character	2-29
Chaining Formats	2-30
How to Define a Prompting Format	2-32
Prompting Message Control Characters	2-32
How to Use Format Prompting Message Control Values	2-34
Format Example	2-34
Production Statistics	2-35
Job Counters	2-35
Data Station Counters	2-35
Access to Production Statistics	2-36

Chapter 3. The Label Maintenance Utility (SYSLABEL) 3-1

Allocating Data Sets	3-1
Deleting Data Sets	3-1
Modifying Volume Labels	3-2
The Volume Identifier	3-2
The Owner Identifier	3-2
Volume-Protect (Accessibility) Field	3-2
Modifying Data Set Labels	3-2
Data Set Name (User-Defined)	3-3
Bypass Indicator	3-3
Write-Protect Indicator	3-3
Creation Date	3-3
Multivolume Indicator	3-4
Volume Sequence Number	3-4
Expiration Date	3-4
Verify/Copy Indicator	3-5
Exchange Type	3-5
Record Length	3-6

Delete Character	3-6
Password	3-6
Operation of the Label Maintenance Utility	3-7
Load the Utility (05-00)	3-7
Select the Label Maintenance Option (27-01)	3-8
Allocating a Data Set	3-9
Insert the Diskette that will Contain the Allocated Data Set (27-02)	3-9
Specify the Number of Records to be Allocated (27-03)	3-10
Specify the Delete Character (27-04)	3-11
Deleting a Data Set	3-12
Insert the Diskette with the Data Set to be Deleted (27-05)	3-12
Deleting a Write-Protected Data Set (27-06)	3-13
Deleting an Unexpired Data Set (27-12)	3-14
Specify the Delete type (27-07)	3-15
Modifying a Volume Label	3-16
Insert the Diskette to be Modified (27-08)	3-16
Specify the Volume-Label Parameters (27-09)	3-17
Modifying a Data Set Label	3-18
Insert the Diskette with the Label to be Modified (27-10)	3-18
Specify Changes to the Label (27-11)	3-19
Utility Completed (27-78)	3-20

Chapter 4. The Label List Utility (SYSLIST) 4-1

Operation of the Label List Utility	4-2
Load the Label List Utility (05-00)	4-2
Select the Label List Option (34-01)	4-3
Insert Diskette With the Labels to be Listed (34-02)	4-4
Specify the Output Device (34-03)	4-5
Display the Labels on the Display Screen (34-07)	4-6
Additional Directory Information (34-08)	4-7
Specify Printer Device Address (34-04)	4-8
Diskette Data Set Name and Device Address (34-09)	4-9
Listing in Process (34-06)	4-12
Utility Completed (34-78)	4-12
Label Listing Examples	4-13

Chapter 5. The Copy Utility (SYSCOPY) 5-1

Image Copy	5-3
Volume Copy	5-3
Data Set Copy	5-4
Specify Record Copy	5-5
Specify Key Copy	5-5
Single Drive Data Set Copy	5-6
Creating a Multivolume Data Set	5-6
Operation of the Copy Utility	5-7
Load the Utility (05-00)	5-7
Specify the Copy Option to be Used (31-01)	5-8
Image Copy	5-9
Insert Input Diskette (31-61)	5-9
Insert the Output Diskette (31-62)	5-10
Output Diskette Contains Data Sets (31-06)	5-11
Image Copy in Process (31-77)	5-12
Insert the Input Diskette (31-64)	5-13

Insert the Output Diskette (31-63) 5-14
 Image Copy Completed (31-78) 5-14
 Volume Copy 5-15
 Insert the Input Diskette (31-61) 5-15
 Insert the Output Diskette (31-62) 5-16
 Output Diskette Contains Data (31-23) 5-17
 Current Data Set Copy (31-24) 5-18
 Volume Copy in Process (31-77) 5-19
 Specify the Record Delete Character (31-65) 5-20
 Output Diskette is Full (31-22) 5-21
 Do You Want to Use Multivolume Output Support (31-66) 5-22
 Insert Diskette for Next Volume (31-67) 5-23
 Volume Copy Completed (31-78) 5-23
 Data Set Copy 5-24
 Specify the Input Data Set(s) (31-31) 5-24
 Specify Include/Omit (31-32) 5-25
 Copy Deleted Records (31-68) 5-26
 Insert Deleted Records (31-33) 5-27
 Specify the Frequency of Deleted Records (31-34) 5-28
 Will Copy Omit Marked Records (31-35) 5-29
 Specify the Mark Position in the Record (31-36) 5-30
 Insert Output Diskette (31-70) 5-31
 Output Data Set Contains Data (31-37) 5-32
 Output Data Set Not Found (31-71) 5-33
 Specify the Record Delete Character (31-65) 5-34
 Data Set Copy in Process (31-77) 5-35
 Specify Whether to Use Multivolume Input Support (31-38) 5-36
 Specify Whether to Use Multivolume Output Support (31-66) 5-37
 Insert Diskette for Next Volume (31-67) 5-38
 Data Set Copy Completed (31-78) 5-38
 Specify Record Copy 5-39
 Insert Input Diskette (31-69) 5-39
 Insert Output Diskette (31-70) 5-40
 Output Data Set Not Found (31-71) 5-41
 Copy Deleted Records (31-68) 5-42
 Enter Relative Record Numbers of the Records to be Copied
 (31-46) 5-43
 Copy in Process (31-77) 5-44
 Specify Whether You Want Multivolume Output Support (31-66) 5-45
 Insert Diskette for Next Volume (31-67) 5-46
 Specify Record Copy Completed (31-78) 5-46
 Specify Key Copy 5-47
 Insert Input Diskette (31-69) 5-47
 Insert Output Diskette (31-70) 5-48
 Output Data Set Not Found (31-71) 5-49
 Specify Field Location (31-51) 5-50
 Specify Logical Relation Using AND/OR (31-52) 5-51
 Specify Key Copy in Process (31-77) 5-52
 Specify Whether You Want Multivolume Output Support (31-66) 5-53
 Insert Diskette for Next Volume (31-67) 5-54
 Specify Key Copy Completed (31-78) 5-54
 Single Drive Data Set Copy 5-55
 Insert Input Diskette (31-69) 5-55
 Insert Output Diskette (31-16) 5-56

Insert Input Diskette in Specified Device (31-64) 5-57
Insert Output Diskette in Specified Device (31-63) 5-58
Single Drive Data Set Copy Completed (31-78) 5-58

Chapter 6. The Print Utility (SYSPRINT) 6-1

Operation of the Print Utility 6-3
Load the Print Utility (05-00) 6-3
Specify the Print Option (36-01) 6-4
Specify the Print Format to be Used (36-02) 6-5
Input Diskette (36-03) 6-6
Input Data Set (36-04) 6-7
Specify Record Print (36-05) 6-8
Specify Key Print (36-06) 6-9
Specify Logical Relation Using AND/OR (36-07) 6-10
Specify the Printer Device Address (36-08) 6-11
Specify Printer Control Information (36-09) 6-12
Print in Process (36-10) 6-13
Do you Want to Use Multivolume Support? (36-12) 6-14
Data Set Cannot be Printed (36-11) 6-15
Print Completed (36-78) 6-16
Print Terminated (36-79) 6-16
Hexadecimal Print Example 6-17

Chapter 7. The Clear Utility (SYSCLEAR) 7-1

Terminating the Utility with the Cmd, End-of-Job Key Sequence 7-2
Operation of the Clear Utility 7-3
Load the Clear Utility (05-00) 7-3
Specify the Clear Option (25-01) 7-4
Do You Want the Data Cleared? (25-02) 7-5
Diskette/Group Clear 7-6
Insert the Diskette to be Cleared (25-12) 7-6
Clear ALL Data Sets (25-13) 7-7
Data Set Write-Protected All (25-10) 7-8
Data Set is Unexpired All (25-11) 7-9
Data Set Not Cleared (25-06) 7-10
Clear in Process (25-07) 7-11
Utility Completed (25-78) 7-11
Data Set Clear 7-12
Insert the Diskette with the Data Set to be Cleared (25-04) 7-12
Data Set Write-Protected (25-05) 7-13
Data Set Unexpired (25-09) 7-14
Data Set Not Cleared (25-06) 7-14
Data Set Clear is in Process (25-07) 7-15
Utility Completed (25-78) 7-15

Chapter 8. The Initialization Utility (SYSINIT) 8-1

Diskette Initialization 8-1
Diskette Formats 8-2
Additional Data Set Labels for a Diskette 2D 8-3
ASCII and EBCDIC Diskettes 8-4
Disk Initialization 8-4
Operation of the Initialization Utility 8-6
Load the Utility (05-00) 8-6
Insert the Diskette to be Initialized (21-01) 8-7

Initialize Nonblank Diskette (21-02) 8-8
 Disk Contains Password-Protected Data Sets (21-13) 8-9
 Specify EBCDIC or ASCII (21-03) 8-10
 Do You Want to Use the Same Parameters? (21-04) 8-11
 Do You Want Explanation of Initialization Parameters?
 (21-05) 8-12
 Explanation of Format Number, Diskette Type and Sector Size
 (21-06) 8-13
 Explanation of Sequence Number, Volume ID and Owner ID
 (21-07) 8-14
 Specify the Initialization Parameters (21-08) 8-15
 Do You Want Diskette Volume-Protected? (21-12) 8-16
 Specify Additional Data Set Labels (21-09) 8-17
 Initialization in Process (21-10) 8-18
 Number of Defective Cylinders (21-11) 8-19
 Utility Completed (21-78) 8-19

Chapter 9. The Resource Allocation Utility (SYSRAU) 9-1

Resource Allocation Table Entries 9-1
 Making Permanent Changes to the Resource Allocation Table 9-2
 Making Temporary Changes to the Resource Allocation Table 9-3
 The Device ID and Physical Address Formats 9-3
 The Maximum Disk Allocation Table 9-3
 Operation of the Resource Allocation Utility 9-4
 Load the Resource Allocation Utility (05-00) 9-4
 Specify the Kind of Change (35-01) 9-5
 Specify Permanent Changes 9-6
 Insert the IPL Diskette for Permanent Changes (35-02) 9-6
 Display the Number of Partition Entries (35-03) 9-7
 Specify Whether to Rebuild Entire Table (35-04) 9-8
 Specify Permanent Partition Entries to Rebuild Table (35-05) 9-9
 Specify Permanent System-Shared Entries to Rebuild Table
 (35-06) 9-10
 Rebuild Maximum Disk Allocation Partition Entries (35-12) 9-11
 Rebuild Maximum Disk Allocation System-Shared Entry (35-13) 9-12
 Select the Table Modification Option (35-07) 9-13
 Specify Permanent Changes to System-Shared Entries (35-09) 9-14
 Specify Permanent Changes to Maximum Disk Allocation System-Shared
 Entry (35-13) 9-15
 Specify the Partition Number (35-08) 9-16
 Specify Permanent Changes to Partition Entries (35-10) 9-17
 Specify Permanent Changes to the Maximum Disk Allocation Partition
 Entry (35-12) 9-18
 Specify Temporary Changes 9-19
 Specify Temporary Partition Entries (35-11) 9-19
 Specify Temporary Maximum Disk Allocation Partition Entry
 (35-12) 9-20
 Utility Completed (35-78) 9-21

Chapter 10. The System Status Utility (SYSSTAT) 10-1

Status Displayed for the System 10-1
 Status Displayed for a User-Defined IPL Data set 10-1
 Operation of the System Status Utility 10-4
 Load the SYSSTAT Utility (05-00) 10-4

Select Status Option (37-01)	10-5
System Status	10-6
Display Status Information (37-10)	10-6
Display Maximum Disk Allocation, Partition Entries (37-21)	10-7
Display Maximum Disk Allocation, System-Shared Entries (37-22)	10-8
IPL Data Set Status	10-9
Insert the IPL Diskette (37-02)	10-9
Which Output Device Will be Used? (37-03)	10-10
Print the IPL Data Set Information (37-04)	10-11
SYSSTAT in Process (37-05)	10-12
Display the IPL Data Set Status Information (37-06 through 37-22)	10-14
Utility Completed (37-78)	10-24

Chapter 11. The Compress Utility (SYSCOMP) 11-1

Operation of the Compress Utility	11-2
Load the Compress Utility (05-00)	11-2
Suitable Backup Should Exist Before Compressing (23-01)	11-3
Insert Diskette to Be Compressed (23-02)	11-4
Data Compression in Process (23-04)	11-5
Termination in Process (23-05)	11-6
Diskette May Be Unusable (23-10)	11-7
Utility Completed (23-78)	11-7
Hints	11-8
Restrictions	11-8

Chapter 12. The Format Conversion Aid Utility (SYS3740C) 12-1

Operation of the Format Conversion Aid Utility	12-3
Load The Utility (05-00)	12-3
Informational Message (29-01)	12-4
Open Data Set Containing Formats (06-82)	12-5
Loading Programs Into The System	12-6
Converting Formats	12-7
Specify the DE/RPG Job Information (29-02)	12-7
Open the DE/RPG Source Data Set (06-82)	12-8
Data Set Open Failed (06-83)	12-9
Allocate Data Set Space (06-84)	12-10
Utility in Process (29-03)	12-12
Utility Completed (29-78)	12-13
Retain/Clear Formats (29-04)	12-13
Modifying a Previously Loaded Format Before Conversion	12-14

Chapter 13. The SCS/BSC IBM 3741 Print Utility (SYSCPRNT) 13-1

IBM 3741 BSC Protocol Data Streams	13-2
Data Type Determination	13-2
IBM 3741 Escape Sequences	13-3
Operation of the SCS/BSC 3741 Print Utility	13-4
Load the SCS/BSC IBM 3741 Print Utility (05-00)	13-4
Specify the Entry Method (39-01)	13-5
Command Data Set (39-17)	13-6
Command Data Set Information (39-18 and 39-19)	13-7
Specify the Print Option (39-02)	13-9

- Specify One Input Data Set (39-03) 13-10
- Specify Input Group (39-05) 13-11
- Specify Printer (39-06) 13-12
- Printer Forms Alignment (39-07) 13-13
- Printer Format Information (39-08) 13-14
- Specify Page Margins (39-09) 13-15
- Specify Vertical Tabs (39-10) 13-16
- Specify Line Margins (39-11) 13-17
- Specify Horizontal Tabs (39-12) 13-18
- Performing Print (39-20) 13-19
- SYSCPRNT in Process (39-77) 13-20
- Inspect Printer Forms Alignment (39-13) 13-21
- Invalid Escape Sequence (39-14) 13-22
- Data Set Open Failure (39-15) 13-23
- Multivolume Input (39-16) 13-24
- Restarting SCS Print 13-25
 - SYSCPRNT Completed (39-78) 13-28
 - SYSCPRNT Terminated (39-79) 13-28
- Printer Format Record 13-29

Chapter 14. The Data Set Display Utility (SYSBROWS) 14-1

- Operation of the Data Set Display Utility 14-3
 - Load the Data Set Display Utility (05-00) 14-3
 - Data Set Type (40-01) 14-4
 - Insert Diskette to be Scrolled (40-02) 14-5
 - The Help Screen (40-03) 14-6
 - Displaying the Data Set 14-7
 - Data Set Display Utility Complete (40-78) 14-14
 - Data Set Display Utility Terminated (40-79) 14-14

Chapter 15. The Menu Utility (SYSMENU) 15-1

- Skipping Menu Options 15-2
- Using the Function Keys 15-3
- Operation of the Menu Utility 15-4
 - Load the Menu Utility (05-00) 15-4
 - SYSMENU in Process (41-77) 15-5
 - Level 1 Menu (41-01) 15-6
 - Level 2 Menu (41-02) 15-7
 - Level 3 Menu (41-03) 15-8
 - Change Level 1 Menu (41-05) 15-9
 - Menu Utility Complete (41-78) 15-10
 - Menu Utility Terminated (41-79) 15-10

Chapter 16. The Menu Configuration Utility (SYSMCU) 16-1

- Creating a New Data Set 16-2
- Modifying an Existing Data Set 16-2
- Viewing Changes to a SYSMCR Data Set 16-2
- Operation of the Menu Configuration Utility 16-4
 - Load the Menu Configuration Utility (05-00) 16-4
 - Load SYSMCR (42-01) 16-5
 - Allocate SYSMCR (42-02) 16-6
 - Menu Configuration Options (42-03) 16-7
 - Level 1 Title (42-11) 16-8
 - Change Level 2 Menu Options (42-21) 16-9

Add Level 2 Menu (42-22)	16-10
Specify Update Level 2 Menu (42-23)	16-11
Specify Delete Level 2 Menu (42-24)	16-12
Delete Level 2 Menu (42-25)	16-13
Specify Level 2 Menu (42-31)	16-14
Level 3 Menu Options (42-32)	16-15
Specify Repeat of Adds (42-33)	16-16
Specify Repeat of Updates (42-35)	16-17
Specify Update Program (42-36)	16-18
Add Program (42-34)	16-19
Specify Delete Program (42-37)	16-21
Delete Program (42-38)	16-22
Save Menu Configuration Records (42-04)	16-23
Store the SYSMCR Data Set (42-05)	16-24
EOJ Save SYSMCR (42-06)	16-25
Print SYSMCR (42-41)	16-26
Menu Configuration Utility in Process (42-77)	16-27
Menu Configuration Utility Complete (42-78)	16-27
Menu Configuration Utility Terminated (42-79)	16-27

Appendix A. Language/Keyboard Chart A-1

Glossary X-1

Index X-5

CHAPTER 1. INTRODUCTION TO THE IBM 5280 UTILITIES

The IBM 5280 utilities are IBM-supplied programs that are stored on a diskette. These utilities are a licensed program product that can be used with the system after you have performed an IPL (Initial Program Load) with the IBM-supplied SCP (System Control Programming) diskette or a user-defined IPL data set. See the System Control Programming Reference/Operation Manual for more information about the IPL process.

CONTENTS OF THE UTILITIES DISKETTE

The following list shows the IBM 5280 utilities, the data set names that are used to load them into the system, and the minimum partition size required for each utility:

Data Set Name (Program Name)	Utility Program	Minimum Partition Size
SYSKEU	Key entry utility	8K bytes
SYSLABEL	Label maintenance utility	9K bytes
SYSLIST	Label list utility	9K bytes
SYSCOPY	Copy utility	9-11K bytes
SYSPRINT	Print utility	9K bytes
SYSCLEAR	Clear utility	9K bytes
SYSINIT	Initialization utility	9K bytes
SYSRAU	Resource allocation utility	10K bytes
SYSSTAT	System status utility	9K bytes *
SYSCOMP	Compress utility	9K bytes
SYS3740C	3740 format conversion aid utility	9-11K bytes
SYSCPRNT	SCS/BSC IBM 3741 print utility	22K bytes
SYSBROWS	Data set display utility	12-13K bytes
SYSTEMU	Menu utility	16K bytes
SYSMCU	Menu configuration utility	20K bytes

* 16K bytes when the option to display IPL data set contents is chosen

Support Data Set	Description
SYSUPO	Utility programs overlay
SYSFIGS	SYSSTAT IPL option
SYSCFA	Common function support for DE/RPG and SYSKEU
SYSHELP	Common function SYSCFA with the addition of help text

Note: Be sure you have a backup of the utilities diskette. A backup is important when data on the primary diskette becomes inaccessible due to loss, diskette wear, or diskette damage. The

backup diskette should be a diskette 1 initialized to format 2 (see "Chapter 8. The Initialization Utility (SYSINIT)" on page 8-1).

The utilities (and other programs) that are most frequently used can be copied to a user-created diskette or disk known as the **system diskette** or **system disk**. Use of a system diskette or disk lowers the number of diskette insertions and removals during the course of a day.

THE KEY ENTRY UTILITY (SYSKEU)

The key entry utility allows you to enter data directly into a data set. You do not have to write a special program to read, format, and store the data. This utility provides three primary modes of operation and several secondary modes of operation. The three primary modes (enter, update, and verify) allow you to initially enter data into the system, change existing data, and check existing data, respectively. The secondary modes allow you to perform such functions as record insertion or searching, when the system is in one of the primary modes. The key entry utility also maintains production statistics for use in measuring work loads, analyzing errors, and job accounting. Statistics are maintained for each job and for each data station.

In the remainder of this chapter, only the following topics apply to the key entry utility:

- Display Prompts
 - Prompt Numbers
 - Load Prompt
- How to Use Diskettes
- How to Use Data Sets.

All other information about the key entry utility is provided in Chapter 2 of this manual.

THE LABEL MAINTENANCE UTILITY (SYSLABEL)

With the label maintenance utility, you can:

- Allocate data set space
- Delete data sets
- Modify volume labels
- Modify data set labels.

Before data or programs can be stored in a data set, space must be set aside (allocated) for that data set. You specify the record length and how many records will be in the data set; these specifications determine how much space is allocated.

When you delete a data set, the data can be dropped from the data set (the data set remains allocated), or the space assigned to the data set can be freed (the data set is no longer allocated).

You can also use this utility to modify certain fields in the volume label or the data set label, as follows:

- In the volume label, the volume identifier, owner identifier, and volume-protect (accessibility) fields can be modified with this utility.
- In a data set label, the data set name, bypass indicator, write protect indicator, multivolume indicator, volume sequence number, creation date, expiration date, verify/copy indicator, record length, exchange type, and delete character can be modified with this utility. You can also add or modify a password for a disk data set.

THE LABEL LIST UTILITY (SYSLIST)

The label list utility lists (displays, prints, or writes to a diskette or disk data set) the contents of each data set label or volume label. The list can be used to determine what data sets are on a volume and to check other label information.

The following types of listings are available:

- Data set labels
- Only data set names
- Directory information such as the data set names, exchange types, extents, data set protection indicators, record lengths, number of records in the data set, and number of unused records in the data set
- The volume label and the volume format number.

THE COPY UTILITY (SYSCOPY)

This utility provides a variety of ways to copy data sets. You can make another copy of a data set for security reasons or for testing a program. An extra-copy (backup) file of all important data should be maintained. These copies will help you retain the data in case the original data sets are accidentally destroyed or lost. The utility provides the following:

- **Image Copy:** The entire contents of a diskette or disk are copied to another diskette or disk of the same type and initialization.
- **Volume Copy:** A group of data sets or the entire contents of a diskette or disk are copied to another diskette or disk of the same or a different type and initialization. You can add data sets to existing data sets, copy over existing data sets, or copy to an empty diskette or disk.
- **Data Set Copy:** One to four input data sets are copied to a single output data set.
- **Specify Record Copy:** A group of records within a data set are copied to another data set.
- **Specify Key Copy:** Records are copied if they meet the conditions you specify. Up to three conditions can be used in a logical AND/OR relationship.
- **Single Drive Data Set Copy:** A single diskette drive is used to copy a data set from one diskette to another. This copy option should be used when only one diskette drive is available.

THE PRINT UTILITY (SYSPRINT)

The following print types are available:

- **Diskette/group print:** A group of data sets or all data sets on a diskette or disk are printed.
- **Data set print:** A single data set is printed.
- **Specify record print:** A group of records within a data set is printed.
- **Specify key print:** Records are printed if they meet the conditions you specify. Up to three conditions can be used in a logical AND/OR relationship.
- **Specify hexadecimal print:** All or part of a data set is printed in hexadecimal characters.

In addition, you can specify the number of characters per printed line and the number of lines per printed page (except hexadecimal print).

THE CLEAR UTILITY (SYSCLEAR)

The clear utility drops or frees a single data set, a group of data sets, or all the data sets on a diskette or disk. When you drop a data set, the data in the data set is no longer available. However, the data set space is still allocated and can be used to store other data. When you free a data set, the data set space is no longer allocated on the diskette or disk.

THE INITIALIZATION UTILITY (SYSINIT)

The initialization utility formats a diskette. A diskette must be initialized (that is, formatted) before it can be used.

The initialization utility does not reformat a disk. You can use the initialization utility to write a volume label and allocate up to nine additional index cylinders on a disk.

THE RESOURCE ALLOCATION UTILITY (SYSRAU)

The resource allocation utility makes changes in the IBM 5280 resource allocation table. You can change the logical device identifier for a physical device and the maximum allocation table for disk.

You can make either permanent changes or temporary changes to the resource allocation table. Temporary changes do not modify the user-defined IPL data set, but permanent changes do. Therefore, when making permanent changes, you must use the IPL diskette or disk to write the changes to the resource allocation table.

THE SYSTEM STATUS UTILITY (SYSSTAT)

The system status utility displays or prints the current status of the system or of a user-defined initial program load (IPL) data set.

A system status check provides the following information for each configured partition:

- The name of the job operating in each partition
- The partition type (foreground or background, controlled or noncontrolled). Controlled partitions are partitions loaded by the system controller (SYSCTLR). See the Procedure Control Language Reference Manual for more information.
- The loading foreground partition number for each operating background partition
- The partition size.

The system status check also provides the following information if it has been configured:

- Maximum disk allocate values for each partition
- Maximum disk allocate value for the system-shared entries.

A status check for a user-defined initial program load diskette or disk provides the configuration information, such as the IPL data set name, the system size, printer models and addresses, and keyboard languages.

THE COMPRESS UTILITY (SYSCOMP)

The compress utility moves all undeleted data sets on a diskette or disk to the beginning of the diskette or disk. This places any unused space that exists between data sets into one contiguous area. This unused area can then be used to allocate additional data sets. The compress utility also moves the data set labels to the beginning of the label area, and updates the data set addresses on each label.

THE IBM 3740 FORMAT CONVERSION UTILITY (SYS3740C)

The IBM 3740 format conversion utility converts existing IBM 3740 format programs to DE/RPG specifications. The IBM 3740 formats are loaded from a diskette or disk into the system, converted to A and Z specifications, and written to a diskette or disk.

This utility converts basic field definitions and their associated prompts. These basic fields include:

- Right-adjust fields
- Skip fields
- Duplicate fields
- Bypass fields
- Selfcheck fields
- Field totals.

THE STANDARD CHARACTER SET/BINARY SYNCHRONOUS COMMUNICATIONS IBM 3741 PRINT UTILITY (SYSCPRNT)

The SCS/BSC print utility can print:

- A single SCS data set
- A group of SCS data sets having a common group or forms type identifier in the data set names
- The output of the SYSBDCU SCS bypass option.

THE DATA SET DISPLAY UTILITY (SYSBROWS)

The data set display utility displays a data set on a screen. The data set can be a normal IBM 5280 data set or a data set in the format of the log generated by the controller program (SYSCTLR). SYSCTLR is part of the Procedure Control Language program.

THE MENU UTILITY (SYSTEMENU)

The menu utility displays and uses menus created with the menu configuration utility (SYSMCU). An operator can select options from the menus to start a program or procedure instead of entering a name, device address, and partition number. Menu data sets consist of these three levels:

- Level 1 is the title or description of the diskette or disk.
- Level 2 consists of the titles or descriptions of groups of programs or procedures.
- Level 3 items are the programs or procedures you want to load.

SYSTEMENU can initiate programs or procedures from any diskette or disk drive and can load them into background partitions or overlay the partition you are currently using for SYSTEMENU.

THE MENU CONFIGURATION UTILITY (SYSMCU)

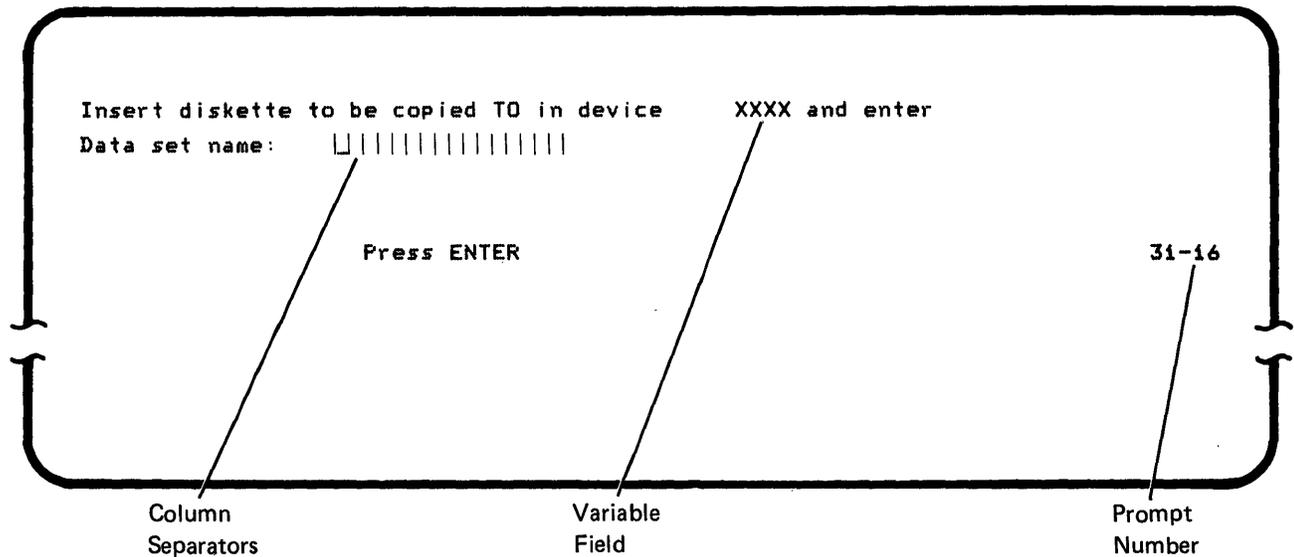
A menu is a displayed list of items or options an operator can select to start a program or procedure. The menu configuration utility provides an easy method of menu development through operator prompts. The menu utility (SYSTEMENU) uses menus developed with the menu configuration utility to load programs or procedures.

With this utility, you can:

- Allocate a menu data set
- Create a menu data set
- Modify menu records
- Store a menu data set
- Print a menu data set.

DISPLAY PROMPTS

The utilities issue display prompts (messages that require responses) for defining the characteristics and parameters of the work to be done. All fields where you should enter responses are subdivided by column separators. The separators are vertical lines that mark character positions on the display screen. The following is an example of the use of column separators:



Some display prompts contain more than one field in which you must enter data. In these cases, column separators appear only in the field where the cursor is positioned. After you enter the data for the field, exit the field by pressing the Field Exit key or the Skip key on a data entry keyboard, or by pressing the Field + (Field Plus) key or the Skip key on a typewriter keyboard. (To exit a digits-only field that is also a right-adjust field, you must press the Field Exit key or the Field + key.) When you exit a field, the cursor will move to the first position of the next field, and the column separators will be displayed in that field.

Variable Fields

Some prompts display a field that contains information that is supplied by the program, as indicated in the previous prompt. These fields are represented with Xs in this manual.

Prompt Numbers

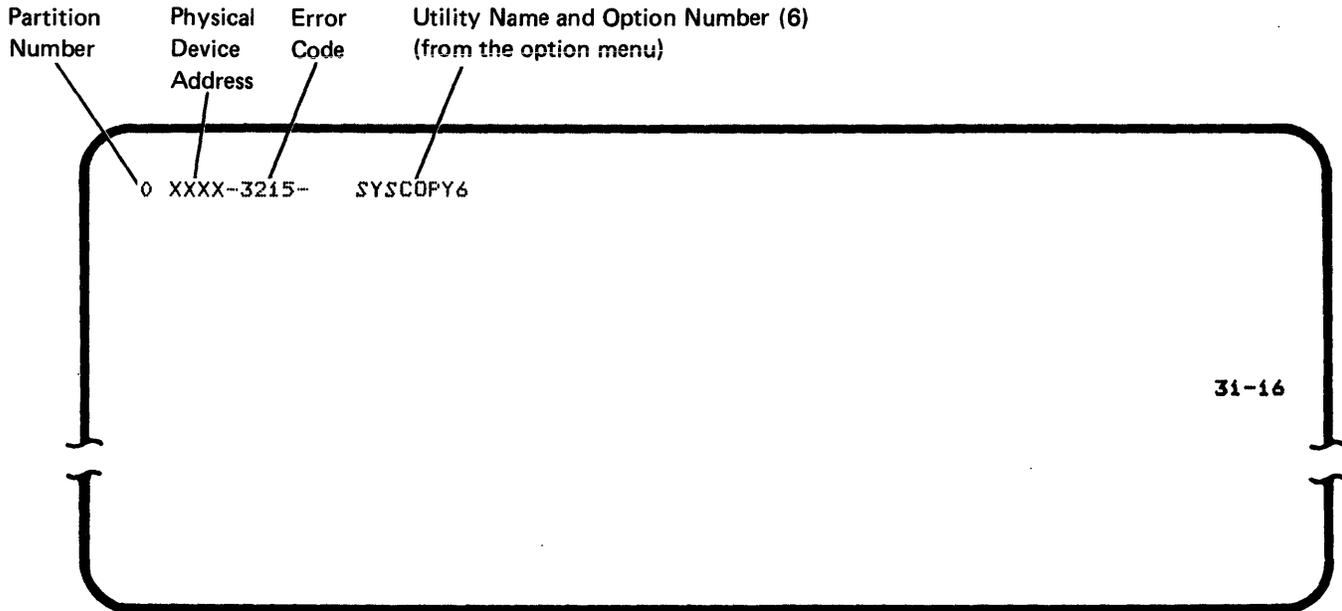
In the lower-right corner of each prompt is a four-digit number, such as 31-16 in the previous prompt. Except for a few prompts that are common to several utilities, the first two digits are unique to each utility. The second two digits identify the different prompts within the utility.

The prompt numbers are included in the headings that precede prompts in the following chapters. In addition, all of the prompt numbers and the corresponding page numbers are listed in the index.

The Status Line

The top line of the display screen is called the status line. It contains information such as the partition number, the program name, and error codes (if an error occurs) for the program currently being executed. The status line is displayed when the load prompt appears, when an error occurs, when a program completes successfully, and when a program terminates because of errors. To alert you when an error occurs, the status line blinks.

The utilities display the following information on the status line when an error occurs.



Note: See "The Key Entry Utility Status Line" on page 2-7 for information about the status line that is displayed during use of the key entry utility.

The Load Prompt

You can load a utility by using the menu utility, entering the utility program name in response to the load prompt, or by calling the utility program with a control language procedure.

The load prompt appears as follows:

```
0 0001      A 16 40
Program name: | | | | | | | | | | | | | | | | | | | | | |
Device address:
Partition number:

                          Press ENTER                               05-00
```

To load a utility in response to this prompt:

1. If necessary, insert the diskette containing the utility into a diskette drive.
2. Enter the program name of the utility (the name of the object code data set).
3. Enter the device address. This can be either the four-character physical address or the two-character logical ID followed by two blanks. This is necessary only if the device address is different from the default, or if no default device address is displayed. (Each device address should be recorded on a label below the drive.)
4. Enter the number of the partition where the utility will execute. If a partition number is not entered, the IBM 5280 will load the program into the partition currently associated with the keyboard at which you are working.
5. Press the Enter key.

From this point on, display prompts will step you through the operation of the utility program.

When you load a utility program by a control language procedure, the responses to some display prompts can be specified within the procedure. These display prompts do not appear to the operator. For more information about loading a utility program by a control

language procedure, see IBM 5280 Procedure Control Language Reference Manual.

If you attempt to load a utility into a partition that already contains a program, an error occurs. The name of the program that is already loaded into the partition will be displayed in the status line. When you press the Reset key, the load prompt is redisplayed without the information you just entered. If you enter the same information a second time and press the Enter key, the utility will be loaded into the partition, replacing the program that had previously been in the partition.

The Diskette Volume-Protected Prompt

An input or output diskette may be protected against unauthorized use. (See "Volume-Protect (Accessibility) Field" on page 3-2). When you attempt to use a protected volume, prompt 05-01 is displayed. The following is an example of this prompt:

```
Diskette is volume protected.  
Device XXXX. Data set XXXXXXXX  
Enter owner identifier to access volume.  
□|||||||
```

Press ENTER

05-01

When this prompt is displayed, you must enter an owner identifier that matches the owner identifier in the volume label. If you enter an identifier that does not match the one in the volume label, an error message is displayed. You can press the Reset key and retry the operation. If you do not know the owner ID, terminate the utility by pressing the Cmd key, then the End-of-Job key.

The Disk Volume-Protected Prompt

Volume protection on a disk protects against unauthorized use of a disk and frees password-protected data sets for certain volume operations. The volume operations include the copy (SYSCOPY), the clear (SYSCLEAR), the label (SYSLABEL), and the initialization (SYSINIT) utilities. When you attempt to use a volume-protected disk for one of these utilities, the following prompt is displayed:

```
Disk is volume protected.  
Device   XXXX  
Enter owner identifier to access volume:  
□□□□□□□□□□
```

Press ENTER

05-01

When this prompt is displayed, you must enter an owner identifier that matches the owner identifier in the volume label. If you enter an identifier that does not match the one in the volume label, an error message is displayed. You can press the Reset key and retry the operation. If you do not know the owner ID, terminate the utility by pressing the Cmd key, and then the End-of-Job key.

For more information see "Volume-Protect (Accessibility) Field" on page 3-2.

The Disk Data Set-Protected Prompt

An input or output disk data set may be protected against unauthorized use. (See "Password" on page 3-6 for information on how to protect data sets.) When you attempt to use a protected data set, this prompt is displayed:

```
Data set is password protected.  
Device  XXXX  Data set  XXXXXXXX  
Enter password to access data set:  
□□□□□□□□□□
```

Press ENTER

05-01

When this prompt is displayed, you must enter a password that matches the password in the data set label. If you enter a password that does not match the one in the data set label, an error message is displayed. You can press the Reset key and retry the operation. If you do not know the password, terminate the utility by pressing the Cmd key, then the End-of-Job key.

Group Data Set Qualifier Processing

Some utilities allow you to process either an entire diskette or disk or a group of data sets. These utilities have a group qualifier field in the insert diskette prompt. The following is an example of this type of prompt:

```
2 0001      N 04 40
Insert diskette with data sets to be cleared and enter
Device address:  | | | |
Group qualifier:  | | | | | | | |
```

Press ENTER

25-12

The group qualifier specifies the common characters and their positions in the data set names you want to process. The utility checks the data set names for any character, except an asterisk, that matches your group qualifier.

The group qualifier field is 8 positions long. Enter the characters that match the set of common characters in the data set names you want to process. Enter an asterisk in the positions where the data set names can vary. (The utility will accept any character or a blank in this position.) If you want to process only data set names of a specific length, enter a blank after your group qualifier.

The following examples show which data sets the utility selects for given group qualifiers:

The diskette has the following data set names:

```
SYSABC      PUNCH1      PRINT100
SYSDEF      PUNCH2      TESTER
SYSABCD     PRINT1       XYZ
```

Group Qualifier	Data Sets Processed
*****	All data sets
SYS*****	SYSABC, SYSDEF, SYSABCD
SYS***	SYSABC, SYSDEF
*****1	PUNCH1, PRINT1
S*E*	SYSDEF, TESTER
****	XYZ
ABC*****	No data sets

The Utility-Completed Prompt

The status line shows the number of the partition in which the program was executed and the name of the utility program that was executed. (You might need this information because more than one program might have access to your keyboard.)

```
0          SYSLABE3
Utility completed.

Options are
  1. Restart
  2. Exit

Select option:   Press ENTER
```

27-78

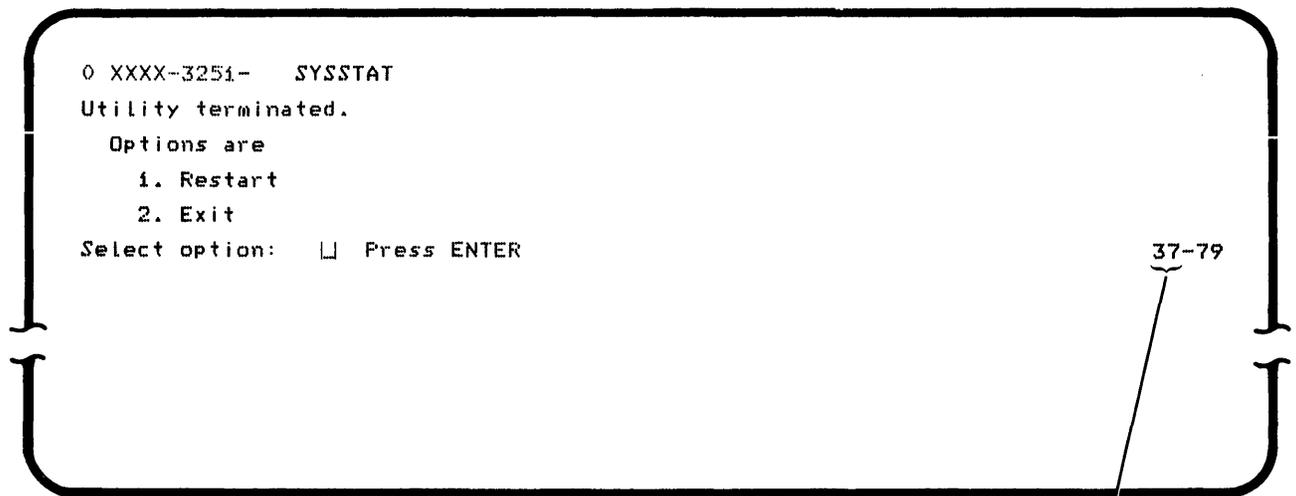
This number varies
with each utility.

The completed prompt allows you to restart the utility or exit from the utility. If you exit from the utility, the load prompt is redisplayed if the utility was executing in a foreground partition; if the utility was executing in a background partition, control returns to the foreground partition associated with the keyboard at which you are working.

The Utility-Terminated Prompt

If a termination error occurs before normal completion of a utility, the following prompt is displayed:

```
0 XXXX-3251-  SYSSTAT
Utility terminated.
Options are
  1. Restart
  2. Exit
Select option:   Press ENTER
```



37-79

This number varies with each utility.

The status line is displayed, showing the device address, error code, and name of the utility. You can either restart or exit from the utility. Before you restart the utility, correct (if possible) the error that caused it to terminate.

Terminating the Utility Using the Cmd, End-of-Job Key Sequence

You can terminate the utility before normal completion by using the Cmd, End-of-Job key sequence. For some utilities, a termination-in-process message is displayed while the utility completes some process; then the utility-terminated prompt is displayed. For other utilities, the utility-terminated prompt is displayed immediately. In either case, no error code or device address is displayed on the status line.

If you use the Cmd, End-of-Job key sequence while the utility-completed prompt is being displayed after normal completion of the utility, the Cmd, End-of-Job key sequence is ignored.

HOW TO USE DATA SETS

A data set is a data file or program that is stored. You can store several data sets on one diskette or disk, or you can store one data set on one or more diskettes. A data set that is stored on more than one diskette or disk is called a **multivolume data set**.

Using the utilities described in this manual, you can:

- Allocate a data set (key entry utility, label maintenance utility, copy utility, or the IBM 3740 format conversion aid utility)
- Enter data into a data set (key entry utility)
- Copy a data set (copy utility)
- Print the contents of a data set (print utility)
- Delete a data set (clear utility or label maintenance utility).

HOW TO USE DISKETTES

The following sections describe the physical characteristics of IBM 5280 diskettes, how records are deleted, how data sets are allocated, and how data sets are deleted.

Diskette Types

The IBM 5280 can use three types of diskettes: diskette 1, which has data recorded on one side; diskette 2, which has data recorded on both sides; and diskette 2D, which has data recorded on both sides at double density. The label attached to the diskette identifies the diskette type.

Diskette Layout

There are 77 concentric tracks on one side of a diskette 1. There are 77 concentric tracks on each side of a diskette 2 and a diskette 2D; for each track on one side of the diskette 2 or 2D, there is an associated track in the same position on the other side of the diskette.

A **cylinder** is one track on a diskette 1, or two associated tracks on a diskette 2 or 2D. The cylinders are numbered from 0 through 76. Cylinder 0 is used for the diskette index. Cylinders 1 through 74 are used for data storage. Cylinders 75 and 76 are alternate cylinders the IBM 5280 uses as replacements for defective cylinders when the diskette is initialized.

The **sector** is a portion of a cylinder. All sectors on a cylinder are the same size. The size of a sector is determined by the format of the diskette.

See the System Concepts manual for more information about the layout of the diskettes.

Diskette Format

The diskette format determines the number of sectors on a cylinder and the number of bytes per sector. Diskette formats are identified by a number from 1 through 9. The format of a diskette is assigned when the diskette is initialized. All diskettes obtained from IBM have been initialized, and the label attached to the diskette identifies the diskette format. However, you can use the diskette initialization utility to assign a different format to the diskette. See "Diskette Formats" on page 8-2, for more information about diskette formats.

See the IBM Diskette General Information Manual, GA21-9182, for more diskette information.

The Diskette Index Cylinder

Cylinder 0 of each diskette is used for the diskette index. Sector 7 contains the volume label, which describes the diskette. Beginning with Sector 8, the remaining sectors contain data set labels; each data set label describes a data set that is stored on the diskette.

Every diskette has one volume label. However, the number of data set labels available is determined by the diskette type, as follows:

- A diskette 1 can have up to 19 data set labels.
- A diskette 2 can have up to 45 data set labels.
- A diskette 2D can have up to 71 data set labels in the index cylinder; however, additional cylinders can be reserved for more data set labels. See "Chapter 8. The Initialization Utility (SYSINIT)" on page 8-1 for more information.

The **volume label** is created and written when the diskette is initialized. The volume label contains information such as the volume identification, the owner identification, and whether the diskette is volume-protected. You can use the label list utility to print or display the volume label. You can use the label maintenance utility to change the volume label.

The **data set label** space is set aside when the diskette is initialized; however, the data set labels themselves are written when the corresponding data sets are allocated on the diskette.

Each data set label contains information such as the data set name, the exchange type, and the address of the data set. You can use the label list utility to print or display the data set labels. You can use the label maintenance utility to change the data set labels.

Exchange Types

The IBM 5280 supports three data exchange types: basic exchange, H exchange, and I exchange.

Basic exchange requires 128-character sectors. The records stored on a basic exchange data set are unblocked and unspanned, and all records must be the same length up to 128 characters. The sectors must be in sequential order if stored on a diskette 1.

A basic exchange data set can be stored on a diskette 1 in format 1 or on a diskette 2 in format 4.

H exchange requires 256-character sectors. The records stored in an H exchange data set are unblocked and unspanned, and all records must be the same length up to 256 characters.

An H exchange data set must be stored on a diskette 2D in format 7.

I exchange can use a sector size of 128, 256, 512, or 1024 characters. The records stored in an I exchange data set are blocked and spanned, and all records must be the same length up to 1024 characters.

An I exchange data set can be stored on any diskette type in any of the 9 formats.

Note: When you use the key entry utility, the maximum record length is 128. The key entry utility does not support multivolume data sets.

If you want to use the data in an existing data set, but the data set is not one of the three exchange types previously described, you may be able to use the copy utility to copy the data set to another data set that has an appropriate exchange type.

You can also use the label maintenance utility to change the exchange type in the data set label if the data set does not contain any data.

Deleting Records

Deleted records either do not yet contain data or contain data that is no longer used. Data can be entered into a deleted record.

For basic and H exchange data sets, the IBM 5280 places a mark in the sector where the record is stored to indicate that the record is

deleted. This is called a physically deleted record. When a record is physically deleted, the data in the record cannot be recovered.

For I exchange data sets, the IBM 5280 places a delete character in the last position of a record to indicate that the record is deleted. This is called a logically deleted record. You specify the delete character when you allocate the data set; the IBM 5280 stores the delete character in the data set label. Any record in the data set that has that character in the last position is considered deleted by the IBM 5280. You can recover the data in the deleted records by changing the delete character in the data set label. Valid delete characters are A through Z or \$. * ; % , # - @ or 0 through 9. When you specify a delete character for a data set, be sure you use a unique character that will never appear in the last position of a valid record.

If you have deleted records in a data set and you want to remove them, copy the data set to another data set using the data set copy option of the copy utility. This copy option lets you copy or remove deleted (unused) records, or insert deleted (empty) records. Deleted records are not removed from the data set when you compress a diskette using the compress utility or copy a diskette using the image or volume copy options of the copy utility.

Allocating the Data Set

When allocating a data set, the IBM 5280 reserves the space on a diskette and stores information about the data set in a data set label.

The space reserved for the data set is called the data set extent. The address of where the data set begins is called the beginning of extent (BOE), and the address of where the data set ends is called the end of extent (EOE). Another address, called the end of data (EOD) address, is maintained by the system to indicate where the next data record will be stored. When the data set is allocated, the end of data address is the same as the beginning of extent address, which indicates that there is no data in the data set.

You can allocate data sets with the label maintenance utility. In addition, if you are using the key entry utility, the copy utility, or the IBM 3740 format conversion aid utility and have not allocated an output data set, the utility prompts direct you in allocating the output data set.

Deleting a Data Set

You can delete a data set that is no longer needed. There are two ways to delete a data set: the data set drop option and the data set free option.

You can drop or free a data set with the clear utility or the label maintenance utility. Use the clear utility if you want to replace the data in the data set with hexadecimal zeros. You might want to replace the data with zeros for security reasons.

When you use the data set drop option, the data set extent space remains allocated on the diskette, but the data set label is changed to indicate that there is no data in the data set. You can enter new records into the data set as though it were a newly allocated data set. The data set name does not change.

When you use the data set free option, the data set label is changed to indicate that the data set is deleted. If you try to open a freed data set, an error occurs. Unless the freed data set was the last data set on the diskette, you cannot allocate another data set in the same extent space; use the compress utility to remove the freed data set extent space from between valid data sets.

If you use the initialization utility to initialize a diskette that already contains data, all data sets are freed and new data sets must be allocated.

HOW TO USE DISKS

The physical and logical characteristics of an IBM 5280 disk are similar to an IBM 5280 diskette. Physically, a disk has more online storage, a predetermined format, and it requires no user handling.

The basic areas where a disk is different from diskette are discussed here. For more information on diskette and disk concepts, see the IBM 5280 System Concepts Manual.

Disk Layout and Format

The disk has four recording surfaces. Each recording surface has 306 concentric tracks. A cylinder is four associated tracks on a disk. Disk cylinders are numbered from 0 through 305. Logical cylinder 0 is used for the disk index. Cylinders 1 through 303 are used for data storage. Cylinders 304 and 305 are used to log system errors and to use as replacement for defective cylinders.

The exchange type for disk is similar to I exchange on a diskette. The sector size is always 256 bytes. The data set records are blocked and spanned and must be the same length up to 4096 characters.

Disk Index Cylinder

Logical cylinder 0 is used for the disk index. The first 128 bytes of sector 4 contain the volume label. The rest of cylinder 0 is used for the data set labels. A disk can have up to 249 data set

labels in the index cylinder. With the initialization utility, you can reserve up to 9 additional cylinders for data set labels. This allows a maximum of 2553 data set labels. See "Chapter 8. The Initialization Utility (SYSINIT)" on page 8-1 for more information on additional data set labels.

CHAPTER 2. THE KEY ENTRY UTILITY (SYSKEU)

The key entry utility allows you to perform a complete data entry job without the use of a compiled program. A data entry job consists of opening a data set, performing the data entry operation, and ending the data entry operation. (When you end a data entry operation, the system automatically closes the data set.)

A data entry operation can consist of entering data records from a source document into a data set or of verifying or updating a data set. You can create and use formats to identify and define each field of a data record.

The utility has three primary modes of operation: enter, update, and verify. These modes of operation allow you to initially enter data into a data set, review and make changes to previously entered data, or verify existing data for accuracy and correct the data if errors are found. The utility also has four secondary modes of operation: search, insert record, record correct, and display verify record. The secondary modes can be used in combination with the primary modes. Detailed information about each mode of operation is provided later in this chapter.

Using the key entry utility, you can create, use, and save record formats and prompting formats. A record format is a set of codes that control how data is entered into a record during a data entry operation. The codes indicate the position, type, and length of each field in the record. A prompting format is a series of messages that identify each field in a record. See "Formats" on page 2-18.

Production statistics, such as the number of keystrokes used for a specific job, are accumulated by the system during data entry operations. Two kinds of production statistics are maintained by the IBM 5280 system: job statistics and data station statistics. Job statistics are maintained by the IBM 5280 system during the execution of a single data entry operation. Data station statistics are maintained by the IBM 5280 system for all data entry jobs that are executed on a specific data station from the time the system is powered on and the IPL (initial program load) process is performed until the initial program load process is performed again. All production statistics can be written to a data set. Production statistics are discussed in more detail later in this chapter. See the System Control Programming/ Reference/Operation Manual for more information about initial program load.

Execution of this utility requires an IBM 5280 system with at least an 8K partition and common function option SYSCFA, SYSHELP, or SYSJCF A.

This utility supports basic, H, and I exchange type data sets with a maximum record length of 128. Multivolume data sets are not supported.

See the Operator's Guide for information about how to use the keys discussed in this chapter.

MODES OF OPERATION

A primary mode of operation (enter, update, or verify) is selected from the primary mode menu after the utility is loaded. The secondary modes can be selected by pressing the appropriate key on the IBM 5280 keyboard. See the Operator's Guide for information about how to change primary modes and how to select the secondary modes. The modes selected are indicated by a code in positions 35-37 of the status line. The form of this code is X-Y, where X indicates the primary mode and Y indicates the secondary mode. The secondary modes can be activated during use of the primary modes.

The following chart lists the primary and secondary modes of operation and the codes that appear in columns 35 through 37 of the status line. The valid mode combinations are:

Mode	Code (columns 35-37)
Enter	E
Update	U
Update-insert record	U-I
Update-search	U-S
Verify	V
Verify-record correct	V-C
Verify-insert record	V-I
Verify-search	V-S
Verify-display	V-D

During each mode, data is entered under the control of one of the formats (0 through 9).

Enter Mode

The enter mode of operation allows you to write new information in a data set. Two types of enter are available: enter-NEW/REPLACE and enter-ADD. Enter-NEW/REPLACE enters data into a data set starting with record one. Existing data in the data set will be replaced. Enter-ADD allows you to enter data after the last record in a data set. (There are no secondary modes of enter.)

If the system is positioned at a record other than record 1 of a data set and the Home key (record backspace) is pressed, the system changes to the update mode.

Update Mode

The update mode of operation allows you to review and/or make corrections to existing records in a data set. The operation starts by displaying the contents of the first record in the data set. To advance to the records to be updated, press the Rec Adv (Record Advance) key, the Page Fwd (Page Forward) key, or the search command function keys. If the data set is a write-protected data set use only the Page Fwd key, or the search command function keys to advance through the data set.

Note: No updating can be made to a write-protected data set.

To update a record, enter the changes and press the Rec Adv key. If the system is positioned at the last record in the data set and the Rec Adv key is pressed, the system changes to the enter mode. Also, if the update mode is specified for an empty data set, the system changes to the enter mode.

Two secondary modes can be used during the update mode: record insert and search. See the Operator's Guide for more information about the secondary modes.

Verify Mode

The verify mode allows you to rekey data to check the accuracy of records. As data is rekeyed from the source document, the utility compares each character to the corresponding character in the original record. During verification, you can use the same format that was used to initially enter the data. If you specify verification of an empty data set, the end-of-the-job prompt (06-89) is displayed. There are four secondary modes of verify: search, insert record, record correct, and display verify record. See the Operator's Guide for more information about the secondary modes.

Verifying a Record

When a record is to be verified, the cursor is initially displayed at the first character position of the first manual field. A manual field is one that allows entry of at least one character. All positions from the cursor to the end of the record are blank. As each character is keyed, it is compared to the corresponding character in the record. If the characters match, the verified character is displayed, and the cursor moves to the next position. If the characters do not match, a verify mismatch error occurs. (See "Verify Mismatch Error.")

Verification of duplicate and skip fields is automatic if the field is defined as an auto duplicate or auto skip field in the record format, and if the auto duplicate/skip function is active when the cursor enters the field.

Whenever a record is changed following a verify mismatch error, the changed record is updated in the data set when the Rec Adv is pressed. If the Home key is pressed causing a record backspace to occur before record advance, the change is not made to the record.

After verification of the last record in a data set, the data set is automatically closed, and a verification code is inserted in the verify field of the data set label.

Verify Mismatch Error

If the character being verified does not match the original character in the record, an error is indicated on the status line. The entire field in which the error occurred is then displayed (with the cursor positioned under the character that did not match). After you press the Reset key, you can again enter a character in the position where the error occurred. If you key the same character a second time, that character replaces the original character in the display. If you key the original character, the character is displayed. The cursor then moves the next position and all unverified character positions are again blank.

Verifying Positive Right-Adjust Numeric Fields

As you key the digits into a right-adjust field that contains a positive value, any fill characters (leading zeros or blanks) are automatically verified unless you have keyed one fill character. (If you key one fill character into the field, you must key in all the fill characters.) To verify the sign of the field, press the Field Exit key on the data entry keyboard of the Field+ (Field Plus) key on the typewriter keyboard. If the verify-sign-mismatch occurs, you can correct the sign by pressing the Field Exit or Field+ key after pressing the Reset key.

Verifying Negative Right-Adjust Numeric Fields

As you key the digits into a right-adjust field that contains a negative value, any fill characters (leading zeros or blanks) are automatically verified unless you have keyed one fill character. (If you key one fill character into the field, you must key in all the fill characters.) To verify the sign of the field, press the Field- (Field Minus) key. If a verify-sign-mismatch error occurs, you can correct the sign by pressing the Field- key after you press the Reset key.

Note: When the last character of a negative field is displayed as the EBCDIC (extended binary-coded decimal interchange code) that character corresponds to one of the following digits.

Digit	EBCDIC Character
— 0	} (brace)
— 1	J
— 2	K
— 3	L
— 4	M
— 5	N
— 6	C
— 7	P
— 8	Q
— 9	R

KEYBOARD SHIFTS

The IBM 5280 keyboards have two keyboard shifts: Alphabetic shift and numeric shift. The keyboard shift determines which symbol on the keytop is selected when the key is pressed. The keyboard shift can be determined by the field definition in the record format or by pressing the appropriate shift key.

Alphabetic Shift

For data entry keyboards, alphabetic shift positions the keyboard to the lower symbol on each key. You can convert the keyboard to alphabetic shift when it is in a numeric shift field by pressing the Alpha (Alphabetic) shift key without the proof feature.

For data entry keyboards with the proof feature, alphabetic shift functions the same as for data entry keyboards without the proof feature.

For typewriter keyboards, alphabetic shift positions the keyboard to the lower symbol on each key. To enter the upper symbol on a key, hold down the  (Shift) key while pressing the desired data key.

All lowercase alphabetic characters are automatically converted to uppercase by the key entry utility.

Numeric Shift

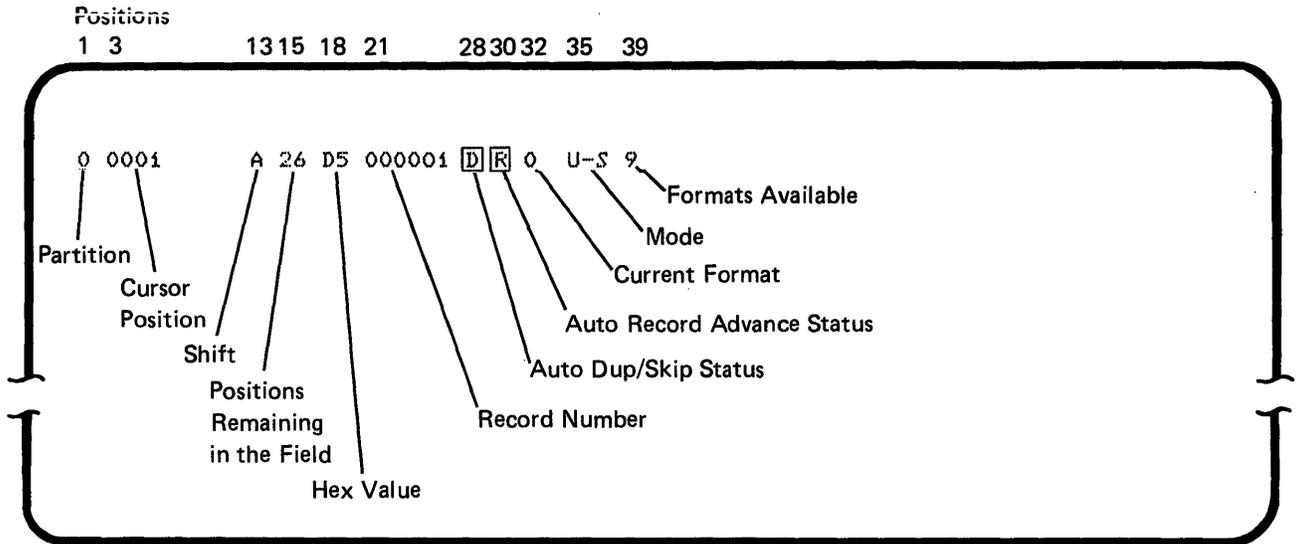
For data entry keyboards, numeric shift positions the keyboard to the upper symbol on each key. You can convert the keyboard to numeric shift when in an alphabetic shift field by pressing the Num (Numeric) shift key.

For data entry keyboards with the proof feature, numeric shift functions the same as the data entry keyboard.

For typewriter keyboards, numeric shift functions the same as alphabetic shift.

THE KEY ENTRY UTILITY STATUS LINE

The status line for the key entry utility remains displayed during all data entry operations. Its format differs from the format of the status line that is displayed with the other utilities. The following shows the format of the status line during normal operation of the key utility:



The following is a description of the contents of the status line:

Position(s)	Contents
1	Partition number
2	Blank
3 through 6	Cursor position from the beginning of the record.
7 through 12	Blank
13	Keyboard shift <ul style="list-style-type: none"> A - alphabetic N - numeric D - digits only displayed in prompts where option is selected.
14	Blank, except when character insert is active, then > is displayed.

Position(s)	Contents
15 and 16	The number of positions remaining to be keyed in the field. This counter will increment or decrement, depending upon the cursor movement through the field. When the cursor is in the first position of the field, this counter represents the field length. When the cursor is in the last position of the field, this counter indicates one position remaining in the field. When the value of this field is greater than 99, two asterisks (**) are displayed in the field. When the value of the field is less than 100, the decimal digits for the value are displayed.
17	Blank
18 and 19	The hexadecimal value of the current cursor position
20	Blank
21 through 26	Record number (includes deleted records)
27	Blank
28	The status of the automatic duplicate/skip function. Blank - off Reverse image D - on
29	Blank
30	The status of the automatic record advance function. Blank - off Reverse image R - on
31	Blank
32	Number of the currently active format
33 and 34	Blank

Position(s)	Contents																				
35 through 37	The currently active mode:																				
	<table border="0" style="margin-left: 40px;"> <thead> <tr> <th style="text-align: left;">Code</th> <th style="text-align: left;">Mode</th> </tr> </thead> <tbody> <tr> <td>E</td> <td>Enter</td> </tr> <tr> <td>U</td> <td>Update</td> </tr> <tr> <td>U-I</td> <td>Update-insert record</td> </tr> <tr> <td>U-S</td> <td>Update-search</td> </tr> <tr> <td>V</td> <td>Verify</td> </tr> <tr> <td>V-C</td> <td>Verify-record correct</td> </tr> <tr> <td>V-I</td> <td>Verify-insert record</td> </tr> <tr> <td>V-S</td> <td>Verify-search</td> </tr> <tr> <td>V-D</td> <td>Verify-display</td> </tr> </tbody> </table>	Code	Mode	E	Enter	U	Update	U-I	Update-insert record	U-S	Update-search	V	Verify	V-C	Verify-record correct	V-I	Verify-insert record	V-S	Verify-search	V-D	Verify-display
Code	Mode																				
E	Enter																				
U	Update																				
U-I	Update-insert record																				
U-S	Update-search																				
V	Verify																				
V-C	Verify-record correct																				
V-I	Verify-insert record																				
V-S	Verify-search																				
V-D	Verify-display																				
38	Blank																				
39	Maximum number of formats available																				

When an error occurs, an error code is displayed in positions 8 through 11, and the first 20 positions of the status line blink. Write down the error code, then press the Reset key; the status line stops blinking and the error code is removed. Then take the appropriate recovery action to continue the data entry process. See the Message Manual for detailed information about error recovery procedures for each error code.

See the Operator's Guide for more information about the status line.

OPERATION OF THE KEY ENTRY UTILITY

In the following prompt illustrations, some fields contain lowercase x's to indicate that the information in the field varies.

Load the Key Entry Utility (05-00)

To load the utility, respond to the following prompt:

```
0 0001      A 16 40
Program name: |XXXXXXXXXXXXXXXXX|
Device address:
Partition number:
```

Press ENTER

05-00

1. If necessary, insert the diskette containing the utility into a diskette drive.
2. Enter SYSKEU as the program name.
3. Enter the device address.
4. Enter the number of the partition where the utility will execute.

Note: It is necessary to specify a partition number only if you wish to load the key entry utility into a background partition.

5. Press the Enter key.

The system loads the utility and displays the primary mode menu (06-81).

Select the Mode of Operation (06-81)

After the utility is loaded, the primary mode menu is displayed:

```
0 0001      D 01 40
SYSKEU - KEY ENTRY UTILITY
Options are
  1. Enter-NEW/REPLACE    3. Verify
  2. Update               4. Enter-ADD
Select option:   Press ENTER                                06-81
```

If you want to create a format at this time, see "Creating a Format" on page 2-20. If you do not want to create a format, follow these procedures:

1. Select the mode:

Enter a 1 to write new data to an empty data set or write over existing data in a data set. (All existing data will be lost when the new data is written.) Select this mode if you want to allocate a new data set.

Enter a 2 to review and change data previously entered into a data set.

Enter a 3 to verify previously entered data for accuracy and to make corrections if necessary.

Enter a 4 to add data at the end of previously entered data in a data set.

2. Press the Enter key.

The mode of operation you select will be used for your data entry job. When you end the data entry job, this mode menu is redisplayed so you can begin another data entry job or exit the utility. (See "Exiting the Key Entry Utility" on page 2-17.)

After you select the mode and press the Enter key, the data set open prompt (06-82) is displayed.

Data Set Open Failed (06-83)

If you selected enter-NEW/REPLACE from the primary mode menu, and the data set was not found, the following prompt is displayed:

```
0 0021      D 01 40          E
Data set    XXXXXXXX      not found on device   XXXX
Options are
  1. Allocate
  2. Reenter
Select option:   Press ENTER                                06-83
```

1. Select an option:

Enter a 1 to allocate space for the data set.

Enter a 2 to retry the open.

2. Press the Enter key.

If you select option 1, the data set open prompt (06-82) is displayed again with the data you entered previously. At this time, you should specify a new data set name, change the device address, or change the diskette.

If you select option 2, the allocate prompt (06-84) is displayed.

Allocate Data Set Space (06-84)

If the allocate option was selected from the data set open failed prompt, the following prompt is displayed:

```
0 0001      A 26 xx          E
Enter data for data set allocate
Data set name:  xxxxxxxx
Device address:  xxxx   Owner ID:
Exchange type:  I  Number of records:  000000  Record length:  128
                Press ENTER
```

06-84

The display shows:

- The data set name and device address entered for the data set open prompt (06-82).
- The owner ID if specified in the volume-protected prompt (05-01). This field does not appear if you are allocating a disk data set. If you want a disk data set password-protected, use the label (SYSLABEL) utility.
- The default exchange type (I exchange)
- The default value for the number of records (000000)

Note: If the number of records default value is used for diskette, all the remaining space on the diskette will be allocated to this data set. If the default value is used for disk, the actual space allocated depends on how you have configured the maximum disk allocation table. See "The Maximum Disk Allocation Table" on page 9-3 for more information.

- The default value for records length (128). This is the maximum record length for the key entry utility.

You can accept the default values, or you can change any field value to your specifications.

If you do not change the exchange type value, an I exchange data set is allocated. If a blank (space) is entered, a basic exchange data set is allocated. If an H is entered, an H exchange data set is allocated. (See "Exchange Types" on page 1-20 for more information.)

If you do not change the number of records to be allocated, the remaining space on the diskette is allocated to the specified data set. If the entry for record length is not changed, the maximum record length for this utility (128 characters) is used.

When you press the Enter key, the system allocates and opens the data set. You can begin the data entry operation.

Data Entry Operation

After your data set is successfully opened, the system positions the data set to a record. If you selected enter-ADD mode, the record is the next available record (that has not had data previously entered) in the data set. If you selected enter-NEW/REPLACE, verify, or update mode from the primary mode menu, the record is the first record in the data set. If you selected update mode, the contents of the record are displayed.

Now you are ready to enter, update, or verify data. If you want to use a format to define the fields of the data record, the format must have been loaded into the system. Select the record format you want to use. See "Selecting a Format" on page 2-23.

When you complete your data entry operation, end the data entry job by pressing the Cmd key, then pressing the End-of-Job key. The system closes the data set and displays the end-of-job prompt (06-89).

Ending a Data Entry Job (06-89)

When you use the Cmd, End-of-Job key sequence to end a data entry job while the data set is open¹, the following prompt is displayed:

```
0 0001      D 01 40          E
End of job.  Do you want to write statistics?
Options are
  1. Yes
  2. No
Select option:   Press ENTER                                06-89
```

1. Select an option.
2. Press the Enter Key.

If you select option 1, the data set open prompt (06-82) is displayed. If you are using a diskette, insert the diskette that contains the data set (to which the statistics are to be written) into a diskette drive. The data set must have a record length of 128. Enter the data set name and the device address, and press the Enter Key. If the data set is successfully opened, the select statistics prompt (06-90) is displayed.

If you select option 2, the primary mode menu is displayed. You can start another data entry job or exit the utility.

If you select option 2, the primary mode menu is displayed. You can start another data entry job or exit the utility.

¹ If the data set is not open when you use the CMD, End-of-Job key sequence, and if the primary mode menu is not being displayed, the system displays the primary mode menu.

Select Statistics (06-90)

After the data set to which you want the statistics written is opened, the following prompt is displayed:

```
0 0001      D 01 40          E
Select statistics to be written
Options are
  1. Job      3. Both
  2. Station
Select option:   Press ENTER                                06-90
```

1. Specify the kind(s) of statistics to be written.
2. Press the Enter key.

After the statistics are written, the system displays the primary mode menu (06-81).

For more information about the statistics, see "Production Statistics" on page 2-35.

Exiting the Key Entry Utility

You can exit the key entry utility whenever the primary mode menu is displayed. To exit the key entry utility, press the CMD key, then the End-of-Job key. The load prompt is displayed when the utility is exited.

FORMATS

You can use two kinds of formats for data entry operations using the key entry utility: record formats and prompting formats.

A **record format** consists of a specific arrangement of format codes that define the fields of a data record. These format codes control how data is entered into each field of each record.

A **prompting format** consists of a series of prompting messages. Each prompting message identifies a field of a record.

Formats are numbered from 0 through 9. Format 0 is a predefined record format with single-character alphabetic fields. You can create formats 1 through 9 to your specifications.

If you do not want to use prompting formats, you can use all formats (1-9) as record formats. If you want to use prompting formats, the odd-numbered formats (1, 3, 5, 7, 9) must be record formats and the even-numbered formats (2, 4, 6, 8) must be prompting formats. Each prompting format is associated with the next lower-numbered record format. For example, format 2 is a prompting format that identifies the fields of record format 1. Formats 0 and 9 are record formats that cannot have associated prompting formats.

You do not select prompting formats as you select record formats; when you select a record format, the system automatically displays its associated prompting format. (See "Selecting a Format" on page 2-23). The prompting messages of the prompting format are displayed in line 2 of the screen. Only the message for the current field is displayed. After you key data into the field, the message for next field is displayed.

Using the key entry utility, you can:

- Create formats
- Load formats into the IBM 5280 as they are created (maximum of 8 when using only an 8K partition with prompting formats)
- Save formats on a diskette or disk (except format 0)
- Load formats into the IBM 5280 from a diskette or disk (maximum of 8 when using only an 8K partition with prompting formats)
- Display formats
- Change formats (except format 0)
- Chain on record format to another.

The Number of Formats You Can Use

The number of formats you can load and use for a data entry job depends on the size of the partition where the data entry job is executing, the exchange type, the diskette sector size, and the record length. For a basic or H exchange data set, you can use all 9 formats in a partition of at least 8K bytes. For an I exchange data set, use the following chart to determine the maximum number of formats you can use. The disk format will always be I exchange with a sector size of 256 bytes.

Sector Size	Sector Size		Partition Sizes				
	Zero Remainder ¹	Record Length Nonzero Remainder ²	8K	9K	10K	11K	12K
128	X	X	9	9	9	9	9
256	X		9	9	9	9	9
256		X	5	9	9	9	9
512	X		5	9	9	9	9
512		X	-	4	9	9	9
1024	X		-	4	9	9	9
1024		X	-	-	-	5	9

(-) means the data set will not open

For example, if you have an I exchange data set with a record length of 64 characters on a diskette that has a 256-sector size, when the sector size (256) is divided by the record length (64), the result is a zero remainder. In this case, up to 9 formats are available for use in an 8K partition.

If your data set has a record length of 100 characters, when the sector size (256) is divided by the record length (100), the result is a nonzero remainder. In this case, up to 9 formats are available for use in a 9K partition.

Note: The maximum number of formats available for use is displayed in column 39 of the status line.

¹The sector size divided by the record length with a zero remainder.

²The sector size divided by the record length with a nonzero remainder.

Creating a Format

Formats can be created at two times: when the primary mode menu is displayed, or after the data set for the data entry job has been opened. The codes you use to create the formats are described in "How to Define a Prompting Format" on page 2-32 and "How to Define a Record Format" on page 2-24.

Creating a Format When the Primary Mode Menu is Displayed

To create a format when the primary mode menu is displayed, follow these steps rather than selecting a mode:

1. Press the CMD key, hold down the shift key, then press the Clear Screen key. The system clears the display screen and automatically selects format zero.
2. Key in the format.
3. Load the completed format into the system by pressing the Cmd key, holding down the shift key, then pressing the Load Format key, then entering a number you are assigning to the format (1 through 9). After the format is loaded, the screen is cleared.
4. To load more than one format, repeat steps 2 and 3 until all the formats are loaded into the IBM 5280.
5. Press the Cmd key, then the End-of-Job key. The primary mode menu (06-81) is displayed.

Creating a Format After Data Set is Opened

To create a format after a data set is opened, you must have selected update or one of the enter modes from the primary mode menu. At any time after the data set is opened, do the following:

1. Press the Cmd key, hold down the shift key, then press the Clear Screen key. The system clears the display screen and automatically selects format zero.
2. Key in the format.
3. Load the format into the IBM 5280 by pressing the Cmd key, holding down the shift key, then pressing the Load Format key, then entering the number you are assigning to the format (1 through 9) to be loaded. After the format is loaded, the screen is cleared.
4. To load more than one format, repeat steps 2 and 3.
5. If a record was displayed before step 1 was performed, the record is redisplayed.

6. To load more than one format, repeat steps 1 through 3.

Your newly created formats can now be used for your data entry operation. If you want to use these formats in the future, you must write them to diskette or disk. See "Saving Formats."

Saving Formats

Formats can be saved in a data set as they are created, and previously created formats that are loaded into the system can also be saved.

Saving Formats as They are Created

To save formats as they are created, do the following:

1. If necessary, insert the diskette on which the formats will be saved into a diskette drive.
2. Select a mode of operation from the primary mode menu. The mode must be enter-NEW/REPLACE, enter-ADD, or update. Press the Enter key. The data set open prompt is displayed.
3. Enter the name of the data set in which you want the formats saved. Enter the device address and press the Enter key. The system opens the data set and positions the data set to the first record (or next available record if you selected enter-ADD mode).
4. Press the Rec Adv key or the Page Fwd key, or use one of the search functions to position the data set of the record where you want the format to be written.
5. Key in the format. (A format number is not assigned at this time; see step 5 under "Loading a Format From a Data Set" on page 2-22).
6. Press the Rec Adv key to write the format to the data set.
7. Repeat steps 4 through 6 until all formats are keyed and written to the data set.
8. Press the Cmd key, then the End-of-Job key to initiate the end-of-job process; the end-of-job prompt (06-89) is displayed.

Saving Previously Created Formats

To save previously created formats that are already loaded into the system, do the following:

1. Follow steps 1 through 4 of the procedures for saving formats as they are created.
2. Select the format to be saved by pressing the Sel Fmt key followed by the format number.
3. Press the Cmd key, hold down the shift key, then press the Change Format key.
4. Enter the first character of the format.
5. Press the Rec Adv key.
6. Repeat steps 2 through 5 until all formats are saved.
7. Press the Cmd key, then the End-of-Job key to initiate the end-of-job process; the end-of-job prompt (06-89) is displayed.

Loading a Format From a Data Set

To load a format from a data set into the IBM 5280 system, do the following:

1. If necessary, insert the diskette containing the formats into a diskette drive.
2. Select the update mode of operation from the primary mode menu. Press the Enter key. The data set open prompt is displayed.
3. Enter the name of the data set that contains the formats, and enter the device address. Press the Enter key. The system opens the data set and displays the first format.
4. Press the Enter/Rec Adv. key, Page Fwd key, or use one of the search functions to locate the format you want to load.
5. Press the Cmd key, hold down the shift key, press the Load Format key, then enter the number you want to assign to the format. The system loads the format and redisplay the format record.
6. Repeat steps 4 and 5 to load more than one format into the IBM 5280 system.
7. Press the End-of-Job key to initiate the end-of-job process; the end-of-job prompt (06-89) is displayed.

After all the formats are loaded into the system and the end of job prompt is displayed, proceed to the primary mode menu. If you want to begin a data entry operation, select a mode and open you data set for your data entry operation.

Selecting a Format

You can select a record format before you begin to enter data. You must open your data set and position the data set to the record you want to enter, update, or verify before you select a format. You can select any record format that has been loaded into the system.

If you have loaded prompting formats into the system, you select the associated record format rather than the prompting format. When you select a record format that has an associated prompting format, the system displays the appropriate prompting format automatically. If you attempt to select a prompting format, an error occurs.

If you do not select any format, format 0 is used.

To select a record format, do the following:

1. Press the Sel Fmt key on a data entry keyboard, or press the Cmd key, then press the Sel Fmt key on a typewriter keyboard.
2. Key in the format number of the record format you want to use.

The record format you selected will be the active format until you select another record format.

After you have selected a format, the current record is redisplayed according to the new format. Any changes made to the current record using the previous format are ignored.

Displaying or Changing a Format

Any format except format 0 can be displayed or changed when it is the active format.

Formats can be displayed in any of the primary modes of operation. Formats can be changed in the enter and update modes only.

Displaying a format

To display a format, do the following:

1. If the format is not currently active, select the format you want to display. Use the procedures described in "Selecting a Format."

Note: You can display a prompting format by selecting a prompting format number. An error occurs; press the Reset key and continue with the following procedures.

2. Press the Cmd key, hold down the shift key, then press the Display Format key.

The format is displayed; however, the displayed format cannot be changed.

To redisplay the original data record, press the Cmd key, hold down the shift key, then press the Display Data key.

Changing a Format

To change a format, do the following:

1. If the format is not currently active, select the format using the procedures under "Selecting a Format" on page 2-23.

Note: You can change a prompting format by selecting the prompting format number. An error occurs; press the Reset key and continue with the following procedures.

2. Press the Cmd key, hold down the shift key, then press the Change Format key. The system displays the active format and selects format 0 for updating the displayed format.
3. Make the changes to the format.
4. Press the Cmd key, hold down the shift key, press the Load Format key, then enter the number of the format. The changes are loaded into the system.
5. If a record was displayed before step 2 was performed, the record is redisplayed.
6. To use the format that has been changed, select it by press the Sel Fmt key and then entering the number of the format. Then continue to enter data.

HOW TO DEFINE A RECORD FORMAT

A record format is a string of from 1 to 128 characters; each character is a format code. Three types of format codes are provided; field definition characters, field continuation characters, and the end of format character.

Field definition characters define the type of field and indicate where each field in a record starts. If a field is more than one position long, the field definition character is followed by the appropriate **field continuation character(s)**. The field definition character plus the continuation character(s) must equal the length of the field.

The **end-of-format character** E follows the last field definition character or continuation character if the format length is less than the record length.

Enter the record format codes as follows:

1. Start each data field with a field definition character. For example, the character A is used to start an alphabetic field.
2. After you enter the field definition character, enter the number of field continuation character(s) (periods and dashes). Periods specify alphabetic continuation characters, and dashes specify numeric continuation characters. These field continuation characters are used to complete the length of a field.

A 14-character alphabetic field would be continued like this:

A.....

Field continuation characters can be intermixed within any field except right-adjust fields. For example, you can do the following:

A...----.....

where the character A defines a 14-character field which is composed of four alphabetic characters followed by four numeric characters and six alphabetic characters. The following data could be keyed in using this format.

TEST1234FINISH

3. Continue the character string to complete the format:

A.....N----A.....N-----

The following data could be keyed in using this format.

DENISE NOBLES 16527 S. DIXIE HWY. 333-1951

4. To end the format, place the character E one position beyond the end of the format.

The preceding format would look like this when it is completed.

A.....N----A.....N-----E

The format consists of 40 character positions and is ended by the character E in position 41.

If a format is the same length as the record length for the data set, the character E is not required.

Figure 2-1 on page 2-26 lists the record format codes and their meanings.

	Format Codes	Keyboard Shift²	Function
Field Definition Characters	N	Numeric	Manual field
	A	Alphabetic	Manual field
	J	Numeric	Right-adjust, blank fill
	R	Numeric	Right-adjust, zero fill
	I	Alphabetic	Right-adjust, blank fill
	B	Alphabetic	Bypass
	D	Numeric	Automatically duplicates
	U	Alphabetic	Automatically duplicates
	S	Numeric	Automatically skips
	K	Alphabetic	Automatically skips
	C ¹	Numeric	Manual field
	H ¹	Numeric	Manual field
	F ¹	Numeric	Automatically skips
	G ¹	Numeric	Automatically skips
	M ¹	Numeric	Automatically duplicates
	L ¹	Numeric	Automatically duplicates
	V	Numeric	Manual field, verify bypass
	W	Alphabetic	Manual field, verify bypass
	Y	Numeric	Right-adjust, blank fill, verify bypass
	X	Numeric	Right-adjust, zero fill, verify bypass
	Z	Alphabetic	Right-adjust, blank fill, verify bypass
Field Continuation Characters	–	Numeric	Continues field in numeric shift
	•	Alphabetic	Continues field in alphabetic shift
End of Format Character	E		Marks end of format
¹ Self-check is not performed by the key entry utility. Thus the footnoted codes are supported for compatibility with the IBM 3740 System, but only function as they are described.			
² The keyboard shift (A or N) is displayed on the status line. See <i>Keyboard Shifts</i> earlier in this chapter.			

Figure 2-1. Record Format Codes

Note: Field totals are not supported by the key entry utility, and any digit in the format is interpreted by the system as a numeric-shift continuation character.

Field Definition Characters

Manual Numeric Shift Fields

N, V — Defines a manual numeric shift field. If the field is only one position, only the N is required. If the field is longer than one position, the N is followed by continuation characters. Any position in a numeric shift field can be overridden by using the Alpha (Alphabetic) shift key. If a manual numeric shift field need not be verified, use V instead of N.

Manual Alphabetic Shift Fields

A, W — Defines a manual alphabetic shift field. If a field is only one position, only the character A is required. If the field is longer than one position, the A is followed by continuation characters. Any position in the alphabetic shift field can be overridden by using the Num shift key. If a manual alphabetic shift field need not be verified, use W instead of A.

Unconditional Bypass Fields

B — The unconditional bypass field definition character, B, causes the IBM 5280 to bypass the specified field. The character B can be followed by either the dash or the period continuation character.

Right-Adjust Fields

Right adjusting is the action of placing data in the rightmost position(s) of a field. The field must be two or more positions long. Fill characters (zeros or blanks) are placed to the left of the right-adjusted data. To right-adjust positive data, enter the data in the field and press the Field Exit key on the data entry keyboard or the Field+ (Field Plus) key on the typewriter keyboard. To right-adjust negative data, press the Field- (field Minus) key on either keyboard. If the Skip key is used to exit a right-adjust field, it will enter blanks from the cursor position to the end of the field and exit the field without right-adjusting the data. The right-adjust field definition characters are: J, Y, R, X, I, and Z.

J, Y — J defines a numeric shift right-adjust field that uses blank fill characters. If this field need not be verified, use Y instead of J.

R, X — R defines a numeric shift right-adjust field that has zero fill characters. If this field need not be verified, use X instead of R.

I, Z — I defines an alphabetic shift right-adjust field that has blank fill characters. If this field need not be verified, use Z instead of I.

Duplicate Fields

For a duplicate field, the contents of a field in the previous record are copied to the corresponding field in the current record. The field is duplicated when the automatic duplicate/skip function is active. (See the Operator's Guide for more information about the use of the Dup/Skip function key.)

If the automatic duplicate/skip function is not active, the field appears as a manual alphabetic or numeric field, depending on the field definition character.

D, U — D defines a numeric shift duplicate field; U defines an alphabetic shift duplicate field.

Skip Fields

Skip fields are automatically filled with blanks if the automatic duplicate/skip function is active. You might want to use a skip field to insert blanks between two data fields.

When the automatic duplicate/skip function is not active, the field appears as a manual numeric or alphabetic field, depending on the field definition character. In verify mode, skip fields are checked for blanks.

S, K — S defines a numeric skip field; K defines an alphabetic skip field.

Field Continuation Characters

Field continuation characters follow a field definition character. The field continuation characters are: dash(-) for numeric characters and the period (.) for alphabetic characters. Continuation characters indicate the length of a field and the shift (alphabetic or numeric). The field definition character plus the continuation characters must equal the field length. Field continuation characters can be intermixed within any field except right-adjust fields.

End-of-Format Character

The end-of-format character, E, follows the last field definition or field continuation character except when the format has the same length as the record length; in this case the E is omitted. When the cursor reaches a position containing an E in a format, a record advance occurs if the automatic enter function is active. (See the Operator's Guide for more information about the Auto Enter function key.) If this function is not active, the following occurs:

- The cursor blinks in the last position of the record.
- The cursor position counter and the positions-remaining-in-the-field counter are set to zero in the status line. This zero indicates that you should press the Rec Adv key. Pressing the Rec Adv key will cause the record to be written to the data set on the selected device.

Chaining Formats

Several different formats may be required to enter records for a specific job. When this is the case, format chaining can be used. Format chaining automatically selects the next format. Format chaining can be done forward (when record advancing) or backward (when record backspacing with the Home key).

Positions 127 and 128 of a format are used for chaining. Position 128 indicates the next format to select when a record advance occurs. Position 127 indicates the next format to select when a record backspace occurs.

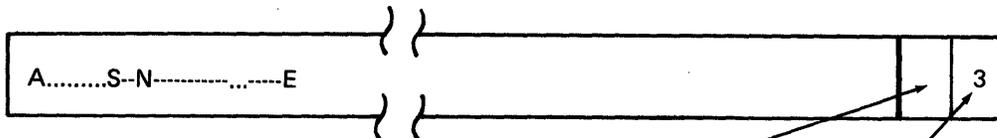
Any valid format number 0 through 9 can be placed into position 127 or 128 of the format.

If you want to use format chaining when the length of the format is equal to 127 or 128, format chaining numbers can be part of a field definition. In this case, the format chaining numbers are also treated as numeric continuation characters.

Format Chaining Examples

In the following example, data is being entered with format 1 in control.

Format 1

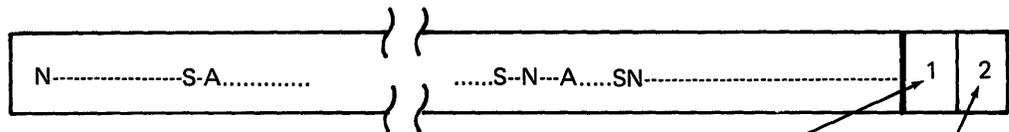


Position 127 contains no chaining character; therefore, when you perform a record backspace with the Home key, format 1 will continue to control the data record.

The 3 is in position 128. After you enter the data record and press the Rec Adv (Record Advance) key, format 3 will control the next data record.

Assume that record advance has occurred and format 3 is now in control.

Format 3

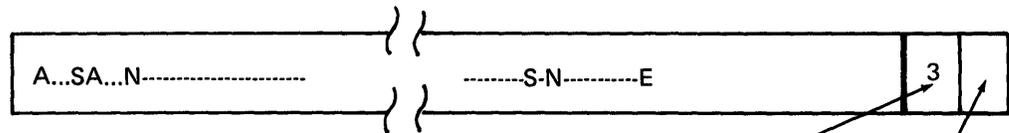


The 1 is in position 127. If a record backspace occurs with the Home key, format 1 will control the data record to which you are backspacing.

The 2 is in position 128. After you enter data and press the Rec Adv key, format 2 will be in control.

Assume that record advance has occurred and format 2 is now in control. Format 2 contains the following:

Format 2



The 3 is in position 127. This means that if a record backspace occurs with the Home key, format 3 will control the record to which you are backspacing.

Position 128 contains no chaining character; therefore, on record advance format 2 will continue to be in control.

Note: Backward format chaining occurs only when the cursor is in the first manual position of the data record when the Home (record backspace) key is pressed.

HOW TO DEFINE A PROMPTING FORMAT

Prompting messages can be defined for each field in a record. Each message can have a maximum length of 80 characters, and a complete prompting format can have a maximum length of 128 characters. The messages are displayed on line 2 of the display screen. A prompting format is directly associated with a record format. That is, for each field in the record format, there is a matching message field in the prompting format. Prompting formats must be stored as even-numbered formats (2, 4, 6, 8). Each prompting format is associated with the next lower-numbered record format. For example, a prompting format stored as format 2 is associated with record format 1. Formats 0 and 9 cannot have prompting formats.

The first character in a prompting format must be an asterisk (*). The asterisk begins the prompt and is not displayed. The asterisk is followed by the prompting message for the first field. Continue entering subsequent prompting messages for the fields of the record, beginning each message with an asterisk.

The following is an example of a prompting format:

```
*DATE*CUSTOMER IDENTIFICATION*QUANTITY*COST
```

If a prompting message is not needed for a field, enter an asterisk for the field. The following shows how the preceding example would look if the message for the quantity field is omitted:

```
*DATE*CUSTOMER IDENTIFICATION**COST
```

Prompting Message Control Characters

Hexadecimal values can be used in prompting messages to control the manner in which the prompting messages are displayed. These values allow you to:

- Use column separators
- Blink characters
- Underline characters
- Intensify characters
- Reverse character images.

The control characters that can be used in prompting messages are:

Hexadecimal Value	Meaning(s)
20	Normal display
21	Reverse image
22	High intensity
23	High intensity, reverse image
24	Underline
25	Underline, reverse image
26	Underline, high intensity
27	Nondisplay of data
28	Blink
29	Blink, reverse image
2A	Blink, high intensity
2B	Blink, high intensity, reverse image
2C	Blink, underline
2D	Blink, underline, reverse image
2E	Blink, underline, high intensity
2F	Nondisplay of data
30	Column separators
31	Column separators, reverse image
32	Column separators, high intensity
33	Column separators, high intensity, reverse image
34	Column separators, underline
35	Column separators, underline, reverse image
36	Column separators, underline, high intensity
37	Column separators, nondisplay of data
38	Column separators, blink
39	Column separators, blink, reverse image
3A	Column separators, blink, high intensity
3B	Column separators, blink, high intensity, reverse image
3C	Column separators, blink, underline
3D	Column separators, blink, underline, reverse image
3E	Column separators, blink, underline, high intensity
3F	Column separators, nondisplay of data

How to Use Format Prompting Message Control Values

To enter the hexadecimal value that will control the display of prompting messages, do the following:

- Press the Cmd key, then the Hex key.
- Enter the hex value to the left of the message. Then enter the hex 20 control character at the end of each prompting message to return the display to normal.

The following example illustrates the use of hexadecimal control values in prompting messages.

* 28 CUSTOMER IDENTIFICATION 20 * 23 QUANTITY 20

Hex 28 controls the display of the CUSTOMER IDENTIFICATION prompting message. When the prompting message is displayed, it blinks.

Hex 23 controls the display of the QUANTITY prompting message. The message is displayed with high intensity and the image is reversed.

Format Example

The following is an example of a source document, and a record format and prompting format that might be used:

	DATE: 8-16-79		
	CUSTOMER ID	QUANTITY	COST
	AAAA	500	\$15.98
Source	BBBB	200	10.00
Document	CCCC	350	12.25

Record
Format D-----A...R----R---E

Prompting
Format *DATE*CUSTOMER IDENTIFICATION*QUANTITY*COST

PRODUCTION STATISTICS

Production statistics are accumulated by the system during the execution of data-entry programs. These statistics are maintained for each job and for each data station. Job statistics are maintained, in reserved counters, only for the duration of the job. At the end of the job, the job statistics are added into counters reserved for the data station statistics, and the job counters are reset to zero.

Job Counters

Job counters are maintained for enter, update, and verify modes. The job counters are updated at the completion of each record and contain the following statistics:

- Number of keystrokes
- Record count
- Elapsed time in minutes
- Number of marked records (always 0 for this utility).

During verify operations, a separate count is maintained for the number of keystrokes in record correct mode. This count is maintained of keystrokes in record correct mode. This count is maintained in the verify correction keystrokes counter.

Data Station Counters

Counters for each data station accumulate the statistics from the job counters since IPL. Additional data station counters contain the number of jobs for which the statistics were collected.

Access to Production Statistics

The statistics for a job or a data station are accessible only at that data station.

At the end of a job, prompts 06-89 and 06-90 are displayed to provide access to job statistics. See "Ending a Data Entry Job (06-89)" on page 2-16.

The statistics are written as a 128-byte record. If both job and data station statistics are required, two records are written; the first record contains the job statistics and the second contains the station statistics. The data set to which the production statistics are written must have a record length of 128. The production statistics record(s) are added to the end of the data set.

The job statistics record contains the statistics in the following sequence: 26 positions for the enter statistics, 26 positions for the update statistics, followed by 26 positions for the verify statistics. The layout of the 128-character record is:

STATISTIC	POSITION			ANY MODE
	Enter MODE	UPDATE MODE	VERIFY MODE	
Keystrokes	1-6	27-32	53-58	
Records	7-12	33-38	59-64	
Marked Records	13-18 ¹	39-44 ¹	65-70 ¹	
Elapsed Time	19-22	45-48	71-74	
Verify Correction	7-12	33-38	59-64	
Keystrokes	23-26 ²	49-52 ²	75-78	
Job Name				119-126
Keyboard Number				127
Type (J-Job or S-Station)				128

Notice that space for the verify correction keystroke counter is allocated in all three statistics groups although a value can be expected in these positions for verify operations only.

¹Always 0 for the key entry utility, except that station statistics may have a value.

²Always 0.

The first 78 positions of a station statistics record are formatted the same as a job statistics record. Three fields are added to contain the job counts for station statistics as follows:

STATISTIC	POSITION		
	Enter MODE	UPDATE MODE	VERIFY MODE
Number of Jobs	79-82	83-86	87-90

Keys included in the keystore count are:

- Data keys that do not result in a character edit check error or verify mismatch error.
- Dup Skip
- → (Character Advance), ← (Character Backspace)
- Field Exit, Field- (Field Minus), Field+ (Field Plus)
- Cmd, Hex key sequences
- Enter/Rec Adv
- Home (record backspace)
- →| (Field Advance), ←| (Field Backspace).

Keys not included in the keystroke counts are:

- Reset
- Shift keys, ⏏ (Shift Lock)
- Data keys that result in an edit check error or verify mismatch error
- → (Cursor Right), ← (Cursor Left), ↑ (Cursor Up), ↓ (Cursor Down), ↵ (New Line)
- Field Corr
- Keystrokes in record correct mode (first pass after Corr key)
- Ins (Character Insert), Del (Character Delete)
- Cmd key sequences (except Cmd Hex key sequences).

CHAPTER 3. THE LABEL MAINTENANCE UTILITY (SYSLABEL)

This utility allows you to create new data set labels and change existing labels on a diskette or a disk.

The following functions are performed:

- Allocate data sets
- Delete data sets
- Modify volume labels
- Modify data set labels.

ALLOCATING DATA SETS

The allocate option of the label maintenance utility establishes space for a new data set on a diskette or disk. The data set space is allocated following the last previously allocated data set on the diskette or disk. The associated label is placed in the first available space in the data set label area.

The utility ensures that the data set name is unique to the diskette or disk and that the newly allocated data set space does not overlap an existing data set.

DELETING DATA SETS

This option allows you to drop or free previously allocated data set space and its label.

When a data set is dropped, the data set label is changed to show that there are no records in the data set, and the data set space remains allocated and is unchanged. The data set and label can be reused.

When a data set is freed, both the data set label and the data space are deleted. The data set space cannot be reallocated for a new data set unless it was physically the last extent, or unless the diskette or disk is first compressed.

Note: The label maintenance utility delete options are different from the clear utility because the label maintenance utility deletes only one data set at a time and does not set the data to hex 00 to delete the data.

MODIFYING VOLUME LABELS

This option allows you to change the following volume label fields:

- The volume identifier
- The owner identifier
- The volume-protect (accessibility) field.

The Volume Identifier

The volume identifier (ID) is a name given to the diskette or disk volume and its contents. New, unused diskettes that are received from IBM contain IBMIRD as the volume ID. With this utility, you can change the IBM-defined volume ID to one of your own. The ID may contain up to six alphameric characters. Any unused positions in the volume ID field will contain blanks.

The Owner Identifier

The owner identifier is a name that must be entered into the IBM 5280 system in response to the volume-protected prompt, to access a volume-protected diskette or disk. It is a user-defined name of up to 14 alphameric characters.

See "The Diskette Volume-Protected Prompt" on page 1-12 and "The Disk Volume-Protected Prompt" on page 1-13 for more information.

Volume-Protect (Accessibility) Field

The volume-protect (accessibility) field restricts access to data on a diskette or disk if any nonblank character appears in this field. Volume protection should not be used on a diskette unless you want to prevent others from using the diskette. A protected diskette cannot be accessed unless the owner identifier is known. The volume-protect field only restricts access to data on a disk for certain volume operations. You should use volume protection on a disk that has password-protected data sets.

MODIFYING DATA SET LABELS

This option of the label maintenance utility allows changes to the following fields:

- Data set name
- Bypass indicator
- Write-protect field

- Creation date
- Multivolume indicator
- Volume sequence number
- Expiration date
- Verify/copy indicator
- Exchange type
- Record length
- Delete character
- Password (for disk only).

If appropriate, the system automatically makes changes to other fields in the data set label so they are compatible with the changes you specify.

Data Set Name (User-Defined)

The data set name is a name you assign to a data set. The name must be unique to the data set. That is, two data sets on the same diskette or disk cannot be assigned the same name. A maximum of eight characters without embedded blanks can be used in the name. The first character of the name must be alphabetic; the rest can be any alphanumeric characters.

Bypass Indicator

The bypass field indicates whether a data set will be skipped during transmittal of data sets with communications. The character B indicates that a data set will not be transmitted; a blank indicates that a data set will be transmitted.

Write-Protect Indicator

The write-protect field indicates whether or not data can be written into a data set. The character P in this field indicates that data can only be read from the data set; a blank indicates that the data can be read from or written to the data set.

Creation Date

This field contains the date when the data set was created. If a system date was specified during initial program load (IPL) (see the System Control Programming Reference/Operation Manual for more

information about IPL), this date is written in the creation date field of the label when the data set space is allocated. If a system date is not specified during IPL, this field remains blank unless a date is specified with this utility.

The format is digits representing YYMMDD, where YY is the low-order (rightmost) two digits of the year, MM is a two-digit representation of the month, and DD is a two-digit representation of the day of the month.

Because this field is a digits-only field, use the Field Exit key on the data entry keyboard or the Field + key on the typewriter keyboard to blank this field.

Multivolume Indicator

This field indicates whether or not a data set appears on more than one volume. A blank in this field indicates that a data set is contained wholly on this diskette or disk. The character C in this field indicates that a data set is continued on another diskette or disk. An L indicates that this is the last of two or more diskettes or disks on which a data set resides.

Volume Sequence Number

Volume sequence numbers indicate the sequence of volumes in a multivolume data set. The sequence must be consecutive, beginning with 01 to a maximum of 99. Blanks in this field are permitted only if the multivolume indicator is also blank.

Because this field is a digits-only field, use the Field Exit key on the data entry keyboard or the Field + key on the typewriter keyboard to blank this field.

Expiration Date

The expiration date indicates when a data set may be deleted. The format is the same as that for the creation date. All nines in the field indicate that a data set will never expire. All blanks indicate that a data set has expired.

If you attempt to delete or clear an unexpired data set, a prompt is displayed giving you the option to continue the delete or clear, or to end the utility.

A data set is expired if:

- You specified a system date during IPL and this date is later than the expiration date.
- The expiration date field contains all blanks.

A data set is unexpired if:

- You did not specify a system date during IPL and the expiration date field contains a date.
- You specified a system date during IPL and this date is not later than the expiration date.
- The expiration date field contains all 9s.

If you have a diskette from a system other than the IBM 5280 that is not basic, H, or I exchange, and it is not empty, you cannot delete the data set other than by reinitializing the diskette. A warning message is displayed letting you know that a nonstandard exchange type is being used. Press the Cmd key, then the End of Job key to terminate the utility. See the System Concepts manual for more information about the expiration date.

Because this date field is a digits-only field, use the Field Exit key on the data entry keyboard or the Field + (Field Plus) key on the typewriter keyboard to blank this field.

Verify/Copy Indicator

This field indicates whether or not a data set has been verified or copied. A blank in this field indicates that a data set is not verified or copied. When all records in a data set have been verified, the system writes a V in this field. The copy utility ignores this field.

If all records in a data set are verified and other records are added later, the V is replaced by a blank (until the additional records are verified).

Exchange Type

This field indicates the data set exchange type. Three exchange types are supported by this system: basic, H, and I.

A blank indicates basic exchange, H indicates H exchange, and I indicates I exchange.

This utility allows you to change the exchange type when a data set does not contain data. Exchange type modification is not allowed in a non-empty data set.

Note: The exchange type for disk is always I.

Record Length

The record length field indicates the number of characters (length) for each record in a data set. When creating a data set, you can specify this five-character field and use one of the field exit keys to exit from this field.

Record length modification is not allowed in a non-empty data set.

Delete Character

The delete character is a user-defined character that indicates that a record is marked for deletion. Any one of these characters can be used as a delete character: A through Z or . & \$ * : - , % # @ or 0 through 9.

Because the IBM 5280 places the delete character in the last data position in a record, select a delete character that is so unique as to never appear in the last position of a valid record. Otherwise, a valid record may be unintentionally deleted.

Delete characters can be specified only for I exchange data sets. They should only be used for data files, not work files or object programs created using the DE/RPG compiler.

Password

The password is a name that must be entered into the IBM 5280 system in response to the data set-protected prompt, to access a protected data set on disk. It is a user-defined name of up to 14 alphameric characters without embedded blanks. See "The Disk Data Set-Protected Prompt" on page 1-14 for more information.

Note: If you choose to password-protect data sets, you may also want to volume-protect the disk. Most volume operations prompt only for the volume owner ID if both the disk and data sets are protected.

OPERATION OF THE LABEL MAINTENANCE UTILITY

Load the Utility (05-00)

To load the utility, respond to the following prompt:

```
0 0001      A 16 40
Program name: | | | | | | | | | | | | | | | | | | | | | |
Device address:
Partition number:

                Press ENTER                                05-00
```

1. If necessary, insert the diskette containing the utility into a diskette drive.
2. Enter SYSLABEL as the program name.
3. Enter the device address.
4. Enter the number of the partition where the program will execute. (If a partition number is not entered, the number defaults to the number of the partition associated with the keyboard at which you are working.)
5. Press the Enter key.

The system loads the utility, then displays the label maintenance option prompt (27-01).

Select the Label Maintenance Option (27-01)

When the program is loaded, the following prompt is displayed:

```
SYSLABEL - LABEL CREATE/MAINTENANCE UTILITY
```

```
Options are
```

- | | |
|-------------|--------------------------|
| 1. Allocate | 3. Modify volume label |
| 2. Delete | 4. Modify data set label |

```
Select option:  U Press ENTER
```

```
27-01
```

Enter the number of the option to be used and press the Enter key. Continue with the operation after referring to the appropriate heading in this operation section.

ALLOCATING A DATA SET

Insert the Diskette that will Contain the Allocated Data Set (27-02)

If option 1 is selected in the label maintenance option prompt (27-01), the following prompt is displayed:

```
|  Insert diskette to be  ALLOCATED  and enter  
  Data set name:  □□□□□□□□  
  Device address:  
  
                        Press ENTER                                27-02
```

| If necessary, insert the diskette with the space to be allocated. Then enter the name of the data set to be allocated and the device address. Press the Enter key. The specify number of records prompt (27-03) is displayed.

Specify the Number of Records to be Allocated (27-03)

After the data set label is accessed, the following prompt is displayed:

```
Specify the number of records to be allocated:  
Exchange type:  I  
Record length:  
Password:
```

Press ENTER

27-03

1. Enter the number of records to be allocated. Then use the Field Exit key on the data entry keyboard or the Field + (Field Plus) key on the typewriter keyboard to exit the field and right-adjust the entry.

Note: If 0 is entered for the number of records to be allocated for a diskette, all remaining space on the diskette will be allocated to this data set. If 0 is entered for the number of records to be allocated for a disk, the actual space allocated depends on how you have configured the maximum disk allocation table. See the System Control Programming Reference Manual or "The Maximum Disk Allocation Table" on page 9-3 for more information.

2. For exchange type, enter I for I exchange, or enter H for H exchange, or press the space bar to enter a blank for basic exchange.

If you specified a disk address, I exchange is displayed. I is the only exchange type allowed for a disk.

3. Enter the record length. Valid entries for record length are:

basic	≤ 128
H	≤ 256
I	≤ 1024 for diskette, ≤ 4096 for disk

4. Enter a password if you want this data set to be password-protected. Valid entries for password are 1 to 14 alphanumeric characters with no embedded blanks. If you do not enter a password the data set is allocated unprotected. (The password field is present only if you specified a disk address.)

5. Press the Enter key.

If basic or H exchange type is specified, and the diskette is volume-protected, the volume-protected prompt is displayed. Enter the owner ID to continue. This utility allocates the data set space, then displays the utility-completed prompt (27-78).

If I exchange is specified, the specify delete character prompt (27-04) is displayed.

Specify the Delete Character (27-04)

If you allocate an I exchange data set, the following prompt is displayed:

Specify the delete character you want:
If no entry is made, then data set cannot contain deleted records.

Press ENTER

27-04

Note: Do not specify a delete character for an object program.

Specify the delete character. (This should be a character that will never appear in the last position of a valid record.) The delete character may be one of these: A through Z, 0 through 9, or . & \$ * ; - , % # and @. Press the Enter key.

If the diskette or disk is volume-protected, the volume-protected prompt is displayed. Enter the matching owner ID to continue the utility.

The utility allocates the data set with the number of records, the exchange type, the record length specified, and the disk data set password, if specified. The utility-completed prompt (27-78) is then displayed.

DELETING A DATA SET

Insert the Diskette with the Data Set to be Deleted (27-05)

If option 2 is selected in the label maintenance option prompt (27-01), the following prompt is displayed:

```
1 0001      A 16 40
Insert diskette to be  DELETED  and enter
Data set name:  □□□□□□□□
Device address:

                          Press ENTER                               27-05
```

Note: The label maintenance utility cannot clear the data portion of the diskette or disk to hex 00. If you want to clear the data portion to hex 00, use the clear utility with the data set free option.

If necessary, insert the diskette with the data set to be deleted. Enter the data set name and the device address, and press the Enter key.

If the diskette is volume-protected, or the data set is password-protected, prompt 05-01 is displayed. Enter the matching owner ID or password, and press the Enter key.

If the data set is write-protected, the write-protected prompt (27-06) is displayed.

If the data set is an unexpired data set, the data set unexpired prompt (27-12) is displayed.

If the data set is not write-protected or unexpired, the specify delete type prompt (27-07) is displayed.

Deleting a Write-Protected Data Set (27-06)

If the specified data set is write-protected, the following prompt is displayed:

```
Data set is write protected.  
Do you want to delete the data set?  
Options are  
  1. Yes          2. No  
Select option:   Press ENTER
```

27-06

Prompt 27-06 informs you that writing data to the data set is prohibited, but you have the option of deleting it.

If you do not want to delete the data set, enter 2 and press the Enter key. The utility-completed prompt (27-78) is displayed.

If you do want to delete the data set, enter 1 and press the Enter key. If the data set is expired, the specify delete type prompt (27-07) is displayed.

Deleting an Unexpired Data Set (27-12)

If the specified data set is unexpired, the following prompt is displayed:

```
Data set is unexpired.  
Do you want data set deleted?  
Options are  
1. Yes      2. No  
Select option:      Press ENTER
```

27-12

If you do not want to delete the data set, enter 2 and press the Enter key. The utility-completed prompt (27-78) is displayed.

If you do want to delete the data set, enter 1 and press the Enter key. The expiration date field is cleared, and the specify delete type prompt (27-07) is displayed.

Specify the Delete type (27-07)

If you delete a data set, the following prompt is displayed:

```
What type of delete do you want?
```

```
Options are
```

```
1. Data set drop
```

```
2. Data set free
```

```
Select option:   Press ENTER
```

27-07

Specify the delete type and press the Enter key.

The system checks to be sure the data set is expired. If the data set is unexpired, an error occurs. The data set cannot be deleted unless the expiration date in the label is changed or removed.

If you specified a system date during IPL and this date is later than the expiration date, the data set can be deleted.

If the expiration date field contains a date, but a system date was not specified during IPL, the data set cannot be deleted.

If the expiration date field is blank, the data set can be deleted.

If all 9s appear in the expiration date field, the data set can never be deleted unless the date in the label is modified. You must modify the date (use this utility to modify the label), then clear it.

Data set drop deletes the data only. The data set still exists, but it contains no logical records. The label remains for reuse.

Data set free deletes both the data and the label. The data remains in place physically but is inaccessible because the labels are deleted. All reference to the data is removed as though it never existed.

After you enter the delete option, the system then performs the drop or free and then displays the utility-completed prompt (27-78).

MODIFYING A VOLUME LABEL

Insert the Diskette to be Modified (27-08)

If you select option 3 in the label maintenance option prompt (27-01), the following prompt is displayed:

```
1 0001      N 04 40
Insert diskette to be  MODIFIED  and enter
Device address:      □□□□

                          Press ENTER                               27-08
```

If necessary, insert the diskette containing the volume label to be modified. Enter the device address, and press the Enter key.

If the diskette or disk is volume-protected, prompt 05-01 is displayed. Enter the matching owner ID, and press the Enter key.

The modify volume label parameters prompt (27-09) is displayed.

Specify the Volume-Label Parameters (27-09)

After you access the diskette or disk, the following prompt is displayed:

```
Modify volume label parameters.
```

```
Volume identifier:  XXXXXX
```

```
Owner identifier:   XXXXXXXX
```

```
Accessibility byte: X
```

```
Press ENTER
```

```
27-09
```

Note: Any character in the accessibility byte field makes the diskette or disk volume-protected. A blank in this field means the diskette or disk is not volume-protected.

The display shows the current contents of these fields in the volume label. You can change any field or leave any field as it is. Use the → (Character Advance) and ← (Character Backspace) keys, the |← (Field Advance) key, or one of the field exit keys to position the cursor at any field(s) to be changed.

When you are satisfied with the volume label parameters, press the Enter key. The label is modified as specified. Upon completion of the modification, the utility-completed prompt (27-78) is displayed.

MODIFYING A DATA SET LABEL

Insert the Diskette with the Label to be Modified (27-10)

If you entered option 4 in the label maintenance option prompt (27-01), the following prompt is displayed:

```
1 0001      A 25 40  
Insert diskette to be  MODIFIED  and enter  
Data set name:      □□□□□□□□  
Device address:
```

Press ENTER

27-10

If necessary, insert the diskette with the data set label to be modified into a diskette drive. Enter the name of the data set and the device address, and press the Enter key.

If the diskette is volume-protected, or the data set is password-protected, prompt 05-01 is displayed. Enter the owner ID, and press the Enter key to continue.

The modify label parameters prompt (27-11) is displayed.

Specify Changes to the Label (27-11)

The following prompt is displayed so you can specify the changes you want to make:

```
Modify data set label parameters.  
Data set name:  □□□□□□□□      Bypass:           Write protect:  
Creation date:  □□□□□□□□      Multivolume:      Volume sequence:  
Expiration date: □□□□□□□□      Verify/copy:     Exchange type:  
Record length:  □□□□□□□□      Delete character: Password:  
                                     Press ENTER
```

27-11

The current values of the label parameters for the specified data set are displayed. You can change any field or leave any field as it is. Use the → (Character Advance) and ← (Character Backspace) keys, the Field Exit key or Field + (Field Plus) key to position the cursor at the field to be modified.

Valid entries are shown in the following chart:

Label Parameters	Valid Entries
Data set name	Initial alphabetic then alphanumeric
Bypass indicator	B, blank
Write-protect	P, blank
Creation date	Digits only
Multivolume	C, blank, L
Volume sequence	01-99, blank (blanks permitted only if multivolume is blank)
Expiration date	Digits only
Verify/copy	V, blank, C
Exchange type	blank, H, I
Record length	Basic ≤ 128 H ≤ 256 I ≤ 1024 for diskette, ≤ 4096 for disk
Delete character	A through Z, 0 through 9, . & \$ * - ; , % # @
Password	1 to 14 characters with no imbedded blanks. If this field is blank, the data set is not password-protected. (The utility displays this label parameter for disk data sets only.)

If you use the data set label modification option (option 4), the system automatically changes other (undisplayed) fields of the data set label, as follows.

- If you change to basic or H exchange type, the system automatically changes these fields:
 - The data set organization field is set to blank, which indicates the relocation of defective sectors is supported
 - The record attribute field is set to blank, which indicates unblocked and unspanned records.
 - The block length is set to the record length.
- If the exchange type is I, or if you change it to I, the system automatically changes these fields:
 - The data set organization field is set to D, which indicates that relocation of defective sectors is not supported.
 - The record attribute field is set to R, which indicates blocked and spanned records.
 - The block length is set equal to the sector size.

If you want to modify the label of an I exchange data set (but not the exchange type), and you have used the data set with a different system, make sure the data set organization field contains a D before you use this utility. Use the label list utility to list the data set label. If the data set organization field does not contain a D, your data set might contain defective sectors. Use the data set copy option of the copy utility to copy the data set to another diskette or disk. This will eliminate the defective sectors.

If a data set is password-protected, the data set security field is set to P, indicating a protected data set. Otherwise, the data set security field is blank.

After you specify the changes, press the Enter key. The system makes the changes and displays the utility-completed prompt (27-78).

Utility Completed (27-78)

After the utility has performed the function you selected, the utility-completed prompt (27-78) is displayed allowing you to exit the utility or restart the utility. If you restart the utility, the label maintenance option prompt (27-01) is displayed.

CHAPTER 4. THE LABEL LIST UTILITY (SYSLIST)

The label list utility displays, prints, or writes to a diskette or disk data set the following:

- All the data set label information
- The data set names only
- A directory of specific label information
- The volume label information (and the volume format number).

Examples of the four formats are provided at the end of this chapter.

Labels on any volume-protected diskette can be displayed or printed only if the owner identifier is entered. The owner identifier is a user-defined name that is given to the diskette. (See "The Diskette Volume-Protected Prompt" on page 1-12).

Labels on a disk are displayed even if the volume is protected. However, the volume password and the password field of any protected data sets are not shown. The protected fields will contain X's on the listed output.

If you list to the printer, all the labels on a diskette or disk can be printed without operator intervention. You can, however, intervene and stop the listing by pressing the Cmd key, then the End-of-Job key. If you list to the display screen, only as many labels as will fit on the screen at one time are displayed. When the screen is full, you can press the Enter key to advance to the next set of labels. The Enter key can be pressed as many times as necessary to display all the labels.

If you list to the diskette or disk and want to use a previously allocated data set, the record length of your data set must be 128 characters. A previously allocated data set can be used to contain output from multiple executions of this utility.

OPERATION OF THE LABEL LIST UTILITY

Load the Label List Utility (05-00)

To load the utility, respond to the following prompt:

```
0 0001      A 16 40
Program name: | | | | | | | | | | | | | | | | | |
Device address:
Partition number:
```

Press ENTER

05-00

1. If necessary, insert the diskette containing the utility into a diskette drive.
2. Enter SYSLIST as the program name.
3. Enter the device address.
4. Enter the number of the partition where the program will execute. (If a partition number is not entered, the number defaults to the number of the partition associated with the keyboard at which you are working.)
5. Press the Enter key.

The system loads the utility and displays the label list option prompt (34-01).

Select the Label List Option (34-01)

When the utility is loaded, the following prompt is displayed:

```
SYSLIST - LABEL LIST UTILITY
```

```
Options are
```

- ```
1. Data set label 3. Directory
2. Data set name 4. Volume label
```

```
Select option: Press ENTER
```

```
34-01
```

### 1. Select an option:

- Enter a 1 to list the data set labels that are on a diskette or disk.
- Enter a 2 to list all the data set names that are on a diskette or disk.
- Enter a 3 to list the contents of the label directory.
- Enter a 4 to list a volume label and format number.

### 2. Press the Enter key.

The insert diskette prompt (34-02) is displayed.

**Note:** The following sequence of prompts is the same (except where noted) for every label list option.

## Insert Diskette With the Labels to be Listed (34-02)

After you select the option number, the following prompt is displayed:

```
Insert diskette to be listed from and enter
Device address: □□□□
```

Press ENTER

34-02

If necessary, insert the diskette to be listed from into a diskette drive. Enter the device address and press the Enter key.

If the diskette to be listed from is volume-protected, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key.

If you selected option 1 or 2 at prompt 34-01 and the diskette or disk you specify has no data set labels to be listed, an error occurs. Press the Reset key to redisplay the insert diskette prompt (34-02).

When the Enter key is pressed and no error occurs, the specify output device prompt (31-03) is displayed.

## Specify the Output Device (34-03)

The following prompt is displayed after the insert diskette prompt:

```
Which output device will be used?
Options are
 1. Display
 2. Printer
 3. Diskette
Select option: Press ENTER 34-03
```

Enter a 1 to list the labels on the display screen, and press the Enter key. The list of labels (34-07) is displayed.

Enter a 2 to print the labels, and press the Enter key. The printer device address prompt (34-04) is displayed.

Enter a 3 to list the labels to a diskette or disk data set. The diskette data set name and device address prompt (34-09) is displayed.

## Display the Labels on the Display Screen (34-07)

The system displays only as many lines of information as will fit on the display screen at one time.

WORKFILE

SCRATCH

MASTER2

ACCTSREC

Press ENTER to continue

34-07

Press the Enter key each time you want additional labels on the diskette or disk to be displayed.

If you are displaying directory information, after the last display of information, the additional directory information prompt (34-08) is displayed.

If you are not displaying directory information, after the last display of labels or names, the utility-completed prompt (34-78) is displayed.

## Additional Directory Information (34-08)

```

Data sets XXXX
Unused header labels XXXX
Remaining space (K-bytes) XXXX
Format X
 Press ENTER 34-08
```

The first line of the prompt shows the total number of data sets on the diskette or disk.

The second line of the prompt shows the number of data set header labels that remain unused on the volume. If additional space remains, these header labels can be used for additional data sets.

The third line of the prompt shows the total number of K bytes remaining to be used on the volume. These bytes follow the last end-of-extent value (1K = 1024).

The fourth line of the prompt shows the format number of the diskette or disk. The format number will be 1-9 for diskettes, or A for disk. (See "Diskette Formats" on page 8-2).

After you press the Enter key, the utility-completed prompt (34-78) is displayed.

## Specify Printer Device Address (34-04)

If you select the print option in the specify output device prompt (34-03), the following prompt is displayed:

```
Enter the following printer information.
Device address: □□□□
Line width (1=80,2=128): 1
Total lines per page (1-255): 066
Printed lines per page (1-255): 055
 Press ENTER
```

34-04

1. Enter the printer device address.
2. Enter the print control information to format the output:
  - The number of characters to be printed per line. (If you specify 80 characters per line the information will be printed on two lines per label. Sample listings are provided at the end of this chapter.)
  - The total number of lines per page (blank and printed).
  - The total number of printed lines per page.

If you leave any of these fields blank, the default values are used.

3. Press the Enter key. If no printer is installed, an error occurs. After you press the Reset key, the specify output device prompt (34-03) is redisplayed.

If you are printing a listing of data set names or a directory, the printing begins and the listing in process prompt (34-06) is displayed.

## Diskette Data Set Name and Device Address (34-09)

If you select the diskette option in the specify output device prompt (34-03), the following prompt is displayed:

```
Insert diskette for OUTPUT and enter
Data set name: □□□□□□□□□□□□□□□□
Device address:

 Press ENTER 34-09
```

Enter the name of the diskette or disk data set where the output is to be listed, and the device address. (The output diskette cannot be the same as the input diskette. However, the output disk may be the same as the input disk.) Press the Enter key.

If the output diskette is volume-protected, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key.

If the data set you specified already exists on the diskette, the system attempts to use it for output. If the previously existing data set has an incorrect record length (i.e., other than 128) or is write-protected, an error occurs. Press the Reset key to redisplay the above prompt. When the Enter key is pressed and no error occurs, the listing in process prompt (34-06) is displayed and the output is written to the specified data set following any previously existing data (i.e., EOD).

If the data set you specified does not already exist on the diskette or disk, the following prompt is displayed:

```
Data set XXXXXXXX not found on device YYYY
Options are
 1. Allocate
 2. Reenter
Select option: Press ENTER 34-10
```

XXXXXXXX is the name of the data set you specified on the previous prompt, and YYYY is the device address. If you want the data set allocated, select option 1 and press Enter. If you select option 2, the previous prompt (34-09) is redisplayed with the data set name and device address you specified.

If you select the option to allocate the data set, the system attempts to allocate an I exchange data set with record length of 128. If space does not exist on the diskette or disk to allocate the data set, an error occurs. Press the Reset key and prompt 34-09 is redisplayed. When the data set is allocated, the listing in process prompt (34-06) is displayed and the output is written to the allocated data set.

When the system allocates the output data set on a diskette, all remaining space on the diskette is temporarily allocated while the listing proceeds. (On disk, all remaining space is temporarily allocated unless the maximum disk allocation table is configured.) When output is completed, any unused space in the output data set is released and is available for allocating other data sets.

When the system allocates the output data set on a disk, the actual space allocated depends on how you have configured the maximum disk allocation table. See the System Control Programming Reference Manual or "The Maximum Disk Allocation Table" on page 9-3 for more information.

Records written to diskette or disk by SYSLIST contain information similar to that listed by the print option. They do not contain printer control characters. The data set print and print by record options of the SYSPRINT utility can be used to list the records. The records contained in this data set can be processed by a user-written program or by the sort/merge licensed program. All records are 128 characters in length. The output is formatted to appear the same as the printed output.

When option 3 (directory list) has been selected and the output is to diskette or disk, the SYSLIST utility places a record ID code in positions 125-127 of each record. These record ID codes are:

| <b>Record Type</b>                       | <b>Code</b>                         |
|------------------------------------------|-------------------------------------|
| Heading                                  | H01                                 |
| Blank record following heading           | H02                                 |
| Each directory listing                   | N00                                 |
| Blank record following directory listing | T01                                 |
| Statistics and format information        | T02, T03, T04, and T05 respectively |

## Listing in Process (34-06)

The following prompt is displayed while the listing is being printed or written to diskette or disk:

```
SYSLIST in process.
```

34-06

If the Cmd, End-of-Job key sequence is used to stop the printing or the printing is otherwise interrupted, the printer may continue to print data momentarily in order to empty the printer's buffer.

When the listing is completed, the utility-completed prompt (34-78) is displayed.

## Utility Completed (34-78)

After all the labels are listed, the utility-completed prompt is displayed, allowing you to exit from the utility or restart the utility. If you restart the utility, the label list option prompt (34-01) is redisplayed.

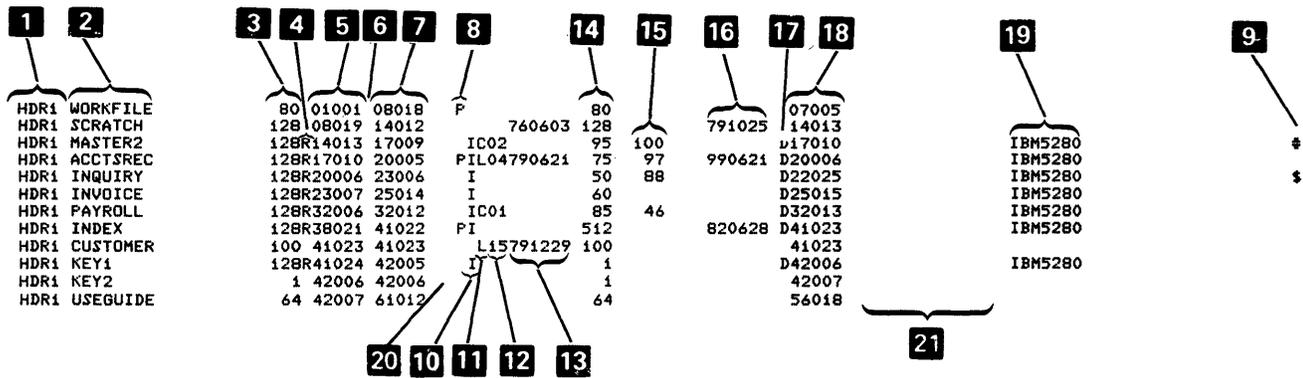
## Label Listing Examples

The following figures show the more commonly used fields of the labels. See the Diskette General Information Manual for more information about diskette labels.

|      |                |                 |   |   |   |   |            |   |            |          |     |        |        |
|------|----------------|-----------------|---|---|---|---|------------|---|------------|----------|-----|--------|--------|
| 1    | 2              | 3               | 4 | 5 | 6 | 7 | 8          | 9 | 14         | 15       | 16  |        |        |
| HDR1 | XI102          | 256R00257100374 |   |   |   |   | I          |   | 821209     | 30000056 |     | D00283 |        |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | PWTESTA        | 256R00375100376 |   |   |   |   | PI         |   | 821203     | 50       | 12  | 820628 | D00377 |
|      |                | IBM5280         |   |   |   |   | %          |   |            |          |     |        |        |
| HDR1 | CTLRN010       | 256R00377100382 |   |   |   |   | I          |   | 821209     | 128      |     |        | D00383 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | OUT            | 256R31912133365 |   |   |   |   | IL03821210 |   | 200        | 24       |     |        | D33366 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | IN91NI62       | 256R01484105390 |   |   |   |   | I          |   | 101023     | 200      | 192 |        | D05391 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | FILE1024       | 256R05391105774 |   |   |   |   | I          |   | 8202151024 |          |     |        | D05775 |
|      |                | IBM5280         |   |   |   |   | %          |   |            |          |     |        |        |
| HDR1 | CTLRLOG        | 256R05775105826 |   |   |   |   | I          |   | 820308     | 128      |     |        | D05827 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | SOURCE         | 256R05827126306 |   |   |   |   | I          |   | 821210     | 80       |     |        | D26307 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | XI204          | 256R26307126377 |   |   |   |   | I          |   | 821210     | 90000200 |     |        | D26357 |
|      |                | IBM5280         |   |   |   |   | G          |   |            |          |     |        |        |
| HDR1 | TSTMCO62       | 256R26378131911 |   |   |   |   | IL02821210 |   | 200        | 104      |     |        | D31912 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | SN111          | 256R33366133492 |   |   |   |   | I          |   | 821211     | 99       | 242 |        | D33377 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | H120           | 256R33493133493 |   |   |   |   | I          |   | 821211     | 120      | 136 |        | D33494 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | SK319          | 256R33494133645 |   |   |   |   | I          |   | 8212111024 |          |     |        | D33646 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | SK110          | 256R33646134163 |   |   |   |   | I          |   | 821211     | 255      | 8   |        | D34164 |
|      |                | IBM5280         |   |   |   |   |            |   |            |          |     |        |        |
| HDR1 | PASSWD01       | 256R34164134167 |   |   |   |   | P I        |   |            | 80       |     |        | D34164 |
|      | XXXXXXXXXXXXXX | IBM5280         |   |   |   |   | %          |   |            |          |     |        |        |
| HDR1 | PASSWD02       | 256R34168134207 |   |   |   |   | P I        |   |            | 100      |     |        | D34168 |
|      | XXXXXXXXXXXXXX | IBM5280         |   |   |   |   | %          |   |            |          |     |        |        |

- |    |                         |    |                                        |
|----|-------------------------|----|----------------------------------------|
| 1  | Label identifier        | 12 | Volume sequence number                 |
| 2  | Data set name           | 13 | Creation date                          |
| 3  | Block length            | 14 | Record length                          |
| 4  | Record attribute        | 15 | Offset to next record space            |
| 5  | Beginning of extent     | 16 | Expiration date                        |
| 6  | Sector size indicator   | 17 | Data set organization                  |
| 7  | End of extent           | 18 | End of data                            |
| 8  | Write protect indicator | 19 | System identifier                      |
| 9  | Delete character        | 20 | Password protect indicator (disk only) |
| 10 | Exchange type           | 21 | Password (always XXX..X)               |
| 11 | Multivolume indicator   |    |                                        |

Figure 4-1. Data Set Label Listing with 80-Character Lines



- |                                  |                                                  |
|----------------------------------|--------------------------------------------------|
| <b>1</b> Label identifier        | <b>12</b> Volume sequence number                 |
| <b>2</b> Data set name           | <b>13</b> Creation date                          |
| <b>3</b> Block length            | <b>14</b> Record length                          |
| <b>4</b> Record attribute        | <b>15</b> Offset to next record space            |
| <b>5</b> Beginning of extent     | <b>16</b> Expiration date                        |
| <b>6</b> Sector size indicator   | <b>17</b> Data set organization                  |
| <b>7</b> End of extent           | <b>18</b> End of data                            |
| <b>8</b> Write protect indicator | <b>19</b> System identifier                      |
| <b>9</b> Delete character        | <b>20</b> Password protect indicator (disk only) |
| <b>10</b> Exchange type          | <b>21</b> Password field (always XXX..XX)        |
| <b>11</b> Multivolume indicator  |                                                  |

Figure 4-2. Data Set Label Listing with 128-Character Lines

```

WORKFILE
SCRATCH
MASTER2
ACCTSREC
INQUIRY
INVOICE
PAYROLL
INDEX
CUSTOMER
KEY1
KEY2
USEGUIDE

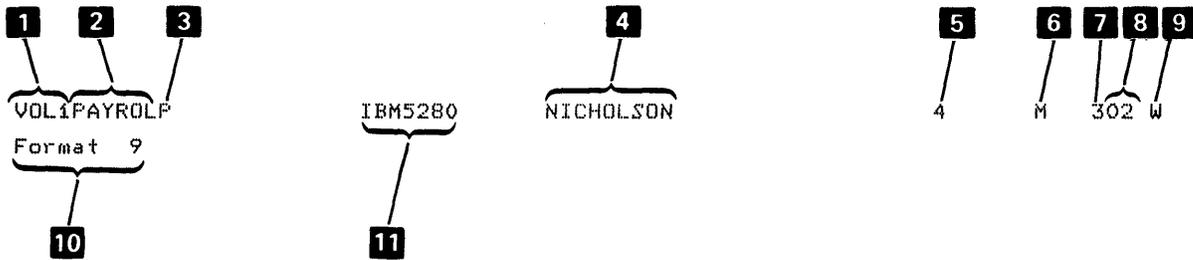
```

Figure 4-3. Data Set Name(s) Listing

| 1                         | 2  | 3     | 4     | 5     | 6  | 7    | 8     | 9      |
|---------------------------|----|-------|-------|-------|----|------|-------|--------|
| DATA SET NAME             | EX | BOE   | EOD   | EOE   | WP | RECL | #REC  | UNUSED |
| XI102                     | I  | 00257 | 00283 | 00374 |    | 300  | 100   | 78     |
| PWTESTA                   | I  | 00375 | 00377 | 00376 | P  | 50   | 10    | 0      |
| CTLRN010                  | I  | 00377 | 00383 | 00382 |    | 128  | 12    | 0      |
| OUT                       | I  | 31912 | 33366 | 33365 |    | 200  | 1861  | 0      |
| IN91NI62                  | I  | 01484 | 05391 | 05390 |    | 200  | 5000  | 0      |
| FILE1024                  | I  | 05391 | 05775 | 05774 |    | 1024 | 96    | 0      |
| CTLRN06                   | I  | 05775 | 05827 | 05826 |    | 128  | 104   | 0      |
| SOURCE                    | I  | 05827 | 26307 | 26306 |    | 80   | 65536 | 0      |
| XI204                     | I  | 26307 | 26357 | 26377 |    | 900  | 20    | 6      |
| TSTMCO62                  | I  | 26378 | 31912 | 31911 |    | 200  | 7083  | 0      |
| SN111                     | I  | 33366 | 33377 | 33492 |    | 99   | 328   | 302    |
| H120                      | I  | 33493 | 33494 | 33493 |    | 120  | 2     | 1      |
| SK319                     | I  | 33494 | 33646 | 33645 |    | 1024 | 38    | 0      |
| SK110                     | I  | 33646 | 34164 | 34163 |    | 255  | 520   | 0      |
| PASSWD01                  | I  | 34164 | 34164 | 34167 |    | 80   | 12    | 12     |
| PASSWD02                  | I  | 34168 | 34168 | 34207 |    | 100  | 102   | 102    |
| Data sets                 |    |       |       |       |    | 0016 |       |        |
| Unused header labels      |    |       |       |       |    | 0489 |       |        |
| Remaining space (K-bytes) |    |       |       |       |    | 1176 |       |        |
| Format                    |    |       |       |       |    | A    |       |        |

- |                       |                                     |
|-----------------------|-------------------------------------|
| 1 Data set name       | 6 Write protect indicator           |
| 2 Exchange type       | 7 Record length                     |
| 3 Beginning of extent | 8 Number of records in the data set |
| 4 End of data         | 9 Number of unused records          |
| 5 End of extent       |                                     |

Figure 4-4. Directory Listing



- |                                                          |                                 |
|----------------------------------------------------------|---------------------------------|
| <b>1</b> Label identifier                                | <b>7</b> Sector size indicator  |
| <b>2</b> Volume identifier                               | <b>8</b> Sector sequence number |
| <b>3</b> Volume protected indicator                      | <b>9</b> Label standard version |
| <b>4</b> Owner identifier (Xs, if disk volume-protected) | <b>10</b> Format                |
| <b>5</b> Extended label cylinders                        | <b>11</b> System identifier     |
| <b>6</b> Diskette type indicator (M=2D)                  |                                 |

Figure 4-5. Volume Label Listing with 128-Character Lines

## CHAPTER 5. THE COPY UTILITY (SYSCOPY)

The copy utility copies data from one diskette or disk to another. This utility can copy part of the contents of a diskette or disk, the entire contents of a diskette or disk, or a multivolume data set. The kinds of copy functions available are:

- Image copy: The entire contents of a single diskette or disk are copied to another diskette or disk of the same type and initialization.
- Volume copy: A group of data sets or the entire contents of a diskette or disk are copied to another diskette or disk. The output diskette or disk can be a different type and initialization. You can copy to an empty diskette or disk, add data sets to existing data sets, or copy over existing data sets.
- Data set copy: The contents of from one to four input data sets are copied to a single output data set.
- Specify record copy: A group of records within a data set is copied to an output data set. You specify the first and last records to be copied.
- Specify key copy: Records are copied to an output data set if they meet the conditions you specify. Up to three conditions can be used in a logical AND/OR relationship.
- Single drive data set copy: A single data set can be copied to another data set using a single diskette drive.

If an I/O error occurs during the actual copy process, the utility-terminated prompt will be displayed with an error message. See "The Utility-Terminated Prompt" on page 1-17.

**Note:** If you copy an IPL data set, use the image copy option. You can also use the volume copy option if you copy the entire contents of the diskette or disk and either the output diskette or disk is empty or you copy over existing data sets on a diskette.

|                                                                                                                              | Number of Drives Required | Type of Input/ Output Diskette | Input/ Output Data Set can reside on Same Diskette | Disk Supported   | Amount of Data Copied         | Adds Data to Existing Data | Allocates Data Set Space | Provides Output Multivolume Support | Copies Deleted Records |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------|----------------------------------------------------|------------------|-------------------------------|----------------------------|--------------------------|-------------------------------------|------------------------|
| Image copy                                                                                                                   | 1 or 2                    | S                              | NA                                                 | Yes <sup>3</sup> | All data sets                 | No                         | Yes                      | NA                                  | Yes                    |
| Volume copy                                                                                                                  | 2                         | S/D                            | NA                                                 | Yes              | A group or all data sets      | Yes                        | Yes                      | Yes                                 | Yes                    |
| Data set copy                                                                                                                | 1 or 2 <sup>1</sup>       | S/D                            | Optional                                           | Yes              | 1 to 4 data sets <sup>2</sup> | Optional                   | Yes                      | Yes                                 | Optional               |
| Specify record copy                                                                                                          | 1 or 2                    | S/D                            | Optional                                           | Yes              | Part of a data set            | Yes                        | Yes                      | Yes                                 | Optional               |
| Specify key copy                                                                                                             | 1 or 2                    | S/D                            | Optional                                           | Yes              | Part of a data set            | Yes                        | Yes                      | Yes                                 | NA                     |
| Single drive data set copy                                                                                                   | 1                         | S/D                            | Optional                                           | No               | Single data set               | Yes                        | No                       | No                                  | No                     |
| S = same diskette type.<br>S/D = the same or different diskette type.<br>NA = not applicable.                                |                           |                                |                                                    |                  |                               |                            |                          |                                     |                        |
| <sup>1</sup> You can use up to 5 drives. <sup>3</sup> Disk to disk only.<br><sup>2</sup> Provides multivolume input support. |                           |                                |                                                    |                  |                               |                            |                          |                                     |                        |

Figure 5-1. Copy Options and Their Functions.

Numeric fields in copy prompts that require multiple digit entries are right-adjusted when the Field Exit key on the data entry keyboard or the Field + (Field Plus) key on the typewriter keyboard is used to exit from the field.

The copy utility requires a minimum 9K partition to copy data sets that have logical record lengths and sector sizes that are less than or equal to 256 bytes. A minimum partition size of 12K bytes of storage is required for copying I exchange data sets that reside on diskettes initialized with format 9 (diskette 2D with 1024-byte sectors).

## IMAGE COPY

Image copy copies all labels and data tracks on one diskette or disk to another diskette or disk of the same type and initialization. For example, the contents of a diskette 1 (with a sector size of 128) can be copied only to another diskette 1 (with the same sector size). The extended label areas for 2D diskettes or disks must also be equal. The diskettes must have the same interchange code (ASCII or EBCDIC) and physical sequence code. The copy is an exact image of the data from which the copy is made. All records, including deleted records and defective sectors, are copied.

The image copy function allows you to use either a single diskette drive or two diskette or disk drives to make the copy. When a single diskette drive is used, both the input and output diskettes use the same drive and are exchanged at various intervals.

Image copy allocates the output data set space to match the input data set space. Therefore, if the output diskette contains existing data sets, you are prompted to either copy over the existing data sets or respecify the device address.

**Note:** You cannot use the image copy function to copy over existing data sets on a disk.

## VOLUME COPY

Volume copy copies a group of common data sets or the entire contents of one diskette or disk to another diskette or disk. See "Group Data Set Qualifier Processing" on page 1-15.

The input and output diskettes or disks for volume copy can have different sector sizes, interchange codes, sequencing, or types. For example, you can copy the contents of a diskette 2 or 2D to several type 1 diskettes.

If the diskette types and initialization are the same and the output diskette does not contain data, the image copy function copies data faster. However, the image copy function does not compress the data. With volume copy, unused spaces between data sets are not copied to the output diskette or disk. Unlike image copy, volume copy does not copy defective sectors (areas where data cannot be written).

The output diskette or disk may contain existing data sets. If it does, you are prompted to either copy over existing data sets or add to the existing data sets. If you choose the option to add to existing data sets, those data sets cannot have the same data set names as data sets on the output diskette or disk. Also, any unallocated space that may exist between the data sets you are adding to will not be compressed. The input and output devices must be online (for example, if you are using diskettes, they must be

inserted into separate diskette drives) for the duration of the copy.

**Notes:**

1. You cannot use the volume copy function to copy over existing data sets on a disk.
2. Multivolume output support is provided by volume copy if an output data set cannot hold all the data from an input data set. However, if a continued multivolume input data set cannot fit wholly on the output diskette or disk, the copy terminates to prevent duplicate sequence numbers on different parts of the same data set. (A continued data set is any part of a multivolume data set that is marked by an indicator (C) in the label.)

**DATA SET COPY**

The data set copy function copies from one to four data sets to a single output data set.

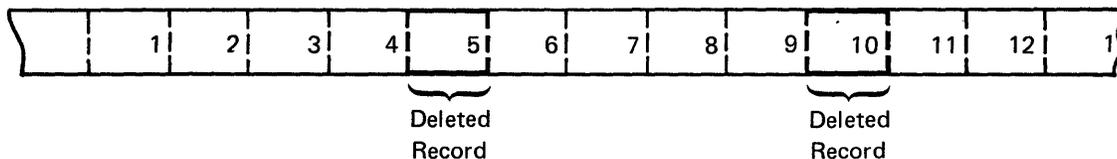
This copy function lets you combine data from up to four data sets and write the data to a single data set. A maximum of four input data sets can be specified and copied at one time. The data sets to be copied are combined in the order specified. Any of the four input data sets may be multivolume. Only one input data set and the output data set need be online at the same time.

Data set copy allows you to include or insert deleted records or omit marked records:

- Include deleted records: The deleted records are copied as they appear in the input data sets. See "Deleting Records" on page 1-20.

**Note:** If you include deleted records in a copy, you cannot insert deleted records in the same copy.

- Insert deleted records: You can insert deleted records in a copy at specified intervals. That is, you determine where the deleted records will appear in the output data set. For example, if you specify that a deleted record be inserted after every fourth record written, your copy will look like the following illustration.



- Omit marked records: Marked records are identified by the character E in a user-defined position in the records. The position in the record can be specified by the DE/RPG keyword MARK. (See the IBM 5280 DE/RPG Reference Manual, SC21-7787, for more information.) The record mark can be used to identify records that contain errors or records that have not been verified.

With data set copy, if you do not use include/omit, all records except deleted records are copied.

The output data set may be preallocated, or it can be allocated by the copy utility. If the data set is allocated by the copy utility, the copy utility attempts to assign the exchange type of the first input data set. If it can not assign the exchange type of the input data set, it will assign an I exchange type. If you want to use a different exchange type or if you want unused space at the end of the data set, you must allocate the data set before making the copy.

If you copy a single data set and the space is allocated by the copy utility, the date fields are copied to the output data set if the input data set has a creation and/or an expiration date in the label.

## SPECIFY RECORD COPY

Specify record copy allows you to copy a group of records by specifying the relative record numbers of the first and the last records to be copied. The relative record number indicates the physical location of a record in a data set. For example, if you specify that the copy starts at relative number two and ends at relative record number five, records two, three, four, and five are copied.

The output data set may be either preallocated or allocated by the utility. If the output data set was preallocated, the utility will add the records to any existing data in the data set.

## SPECIFY KEY COPY

Specify key copy allows you to copy from a data set only the records that meet specific key conditions. A key can be the contents of any field of the record. By responding to prompts, you specify the key, the length of the key field, and the position in the record where the key field begins. You also specify a comparison condition for the key, such as equal, greater than, or less than. For example, if you specify end for the key and equal for the condition, the utility copies all records that end in the field you specify.

You can specify up to three keys. If you specify more than one key, you must also specify a logical relation between the keys. The logical relation can be AND or OR. If you specify the AND relation,

all the key conditions you specify must be satisfied for the record to be copied. If you specify the OR relation, the record is copied if any one of the key conditions is satisfied.

The output data set can be either preallocated or allocated by the utility. If the output data set was preallocated, the utility will add the records to any existing data in the data set.

**Note:** Do not use a field that might contain negative numbers as a key field for this utility.

## SINGLE DRIVE DATA SET COPY

Single drive data set copy allows you to use one diskette drive to make a copy of a data set. Space for the output data set must be allocated before you execute the utility. See "Chapter 3. The Label Maintenance Utility (SYSLABEL)" on page 3-1 for information about data set space allocation. If the output data set contains data, the input data set is added to the end of it. Record lengths for the input and output data sets must be equal.

Single drive data set copy does not copy deleted records.

Single drive data set copy is for diskettes only.

## Creating a Multivolume Data Set

Multivolume output support is provided with all the copy functions except image copy and single drive data set copy. This function allows you to copy data from an input diskette or disk that requires more storage than is currently available on a single output diskette, disk, or data set. For example, you can copy data from a diskette 2 or 2D to several diskette 1's. Any additional output diskettes or disks used for a data set copy, a specify record copy, or a specify key copy must have the same sector size as the initial output diskette or disk. Any additional output diskettes or disks used for a volume copy must have the same sector size and initialization as the first output diskette or disk.

If an output data set cannot hold all the data from an input data set and multivolume support is not used, the incomplete output data set will be erased if the data was being copied over existing data. If the copied data was being added to the end of an existing data set, the incomplete data set will be closed without updating the data set label, in effect restoring the data set to its precopy condition. If the data set was allocated by copy, it is deleted.

## OPERATION OF THE COPY UTILITY

### Load the Utility (05-00)

To load the utility, respond to the following prompt:

```
0 0001 A 16 40
Program name: [|||||]
Device address:
Partition number:

 Press ENTER 05-00
```

1. If necessary, insert the diskette containing the utility into a diskette drive.
2. Enter SYSCOPY as the program name.
3. Enter the device address.
4. Enter the number of the partition where the program will execute. (If a partition number is not entered, the number defaults to the number of the partition associated with the keyboard at which you are working.)
5. Press the Enter key.

The utility is loaded and the select copy option prompt (31-01) is displayed.

## Specify the Copy Option to be Used (31-01)

The utility then displays the following prompt:

```
SYSCOPY - COPY UTILITY
```

```
Options are
```

- |             |                          |
|-------------|--------------------------|
| 1. Image    | 4. Specify record        |
| 2. Volume   | 5. Specify key           |
| 3. Data set | 6. Single Drive Data Set |

```
Select option: Press ENTER
```

```
31-01
```

Select an option and press the Enter key:

- Enter a 1 to use the image copy function and copy the entire contents of one diskette or disk to another of the same type and initialization. The input diskette prompt (31-61) is displayed. See "Image Copy" on page 5-9 to continue.
- Enter a 2 to use the volume copy function and copy a group of data sets or the entire contents of one diskette or disk to another diskette or disk of the same or different type and initialization. The input diskette prompt (31-61) is displayed. (Volume copy prompt 31-61 is different than image copy prompt 31-61.) See "Volume Copy" on page 5-15 to continue.
- Enter a 3 to use the data set copy function and copy up to four input data sets to a single data set. The input data set 1 through 4 prompt (31-31) is displayed. See "Data Set Copy" on page 5-24 to continue.
- Enter a 4 to use the specify record copy function and copy records by specifying relative record numbers. The input data set prompt (31-69) is displayed. See "Specify Record Copy" on page 5-39 to continue.
- Enter a 5 to use the specify key copy function and copy records by specifying up to three record keys. The input data set prompt (31-69) is displayed. See "Specify Key Copy" on page 5-47 to continue.
- Enter a 6 to use the single drive data set copy function. The input data set prompt (31-69) is displayed. See "Single Drive Data Set Copy" on page 5-55 to continue.

When the utility option is chosen and the next prompt is displayed, you can remove the utility diskette from the diskette drive.

## IMAGE COPY

### Insert Input Diskette (31-61)

If you select image copy (option 1) in the select copy option prompt (31-01), the following prompt is displayed:

```
Insert diskette to be copied FROM and enter
Device address: L| | |

 Press ENTER 31-61
```

1. If necessary, insert the input diskette into a diskette drive and enter the diskette device address.
2. Press the Enter key.

If the diskette is volume-protected, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key.

The insert output diskette prompt (31-62) is displayed.

## Insert the Output Diskette (31-62)

After the utility accepts the input diskette, the following prompt is displayed:

```
Insert diskette to be copied TO and enter
Device address: [] [] [] []
```

Press ENTER

31-62

1. If necessary, insert the output diskette into a diskette drive and enter the diskette device address. (If you are using a single drive to make the copy, enter the device address specified for the input diskette.)
2. Press the Enter key.

If the diskette is volume-protected and the owner ID is different from the owner ID specified for the input diskette, the volume-protected prompt (05-01) is displayed. Enter the owner ID and press the Enter key to continue.

If the output diskette contains allocated data sets, prompt 31-06 is displayed. If the output disk contains allocated data sets, an error is displayed.

When the output diskette or disk is successfully accessed, the copy process begins. If you specified different device addresses for the input and output diskettes, the copy in process prompt (31-77) is displayed. If you specified the same device address for the input and output diskettes, the inset input diskette prompt (31-64) is displayed.

## Output Diskette Contains Data Sets (31-06)

```
Output diskette contains data.
The first data set is XXXXXXXX
Do you want to copy over existing data?

Options are
 1. Yes 2. No
Select option: Press ENTER
```

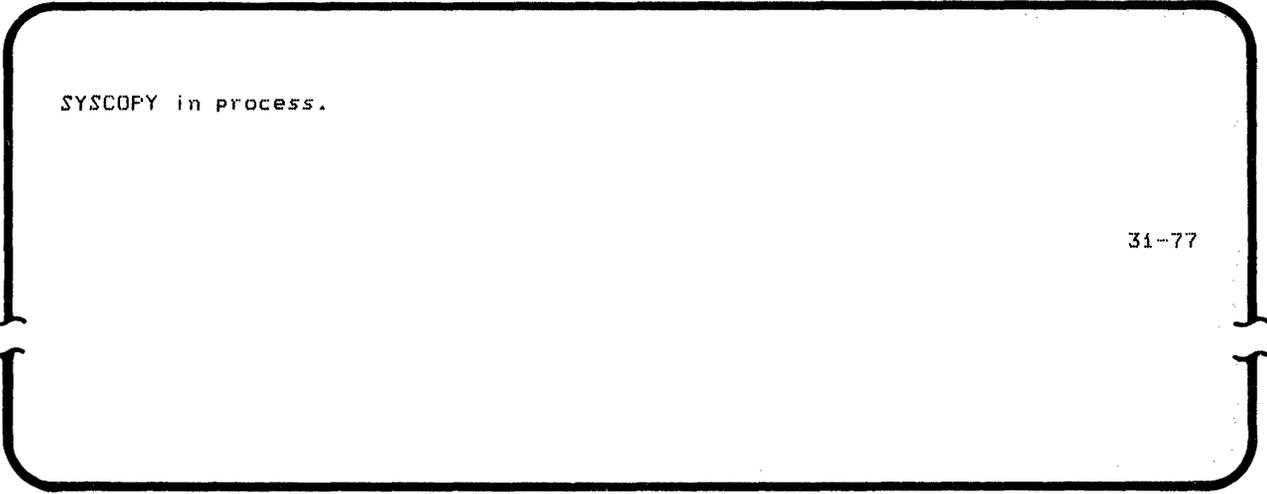
31-06

If you want to copy over the existing data sets, enter 1 and press the Enter key. The data sets are deleted from the diskette and the copy process begins.

If you do not want to copy over the existing data sets, enter 2 and press the Enter key. The insert output diskette prompt (31-62) is redisplayed.

## Image Copy in Process (31-77)

The following prompt is displayed during an image copy that uses two drives:



```
SYSCOPY in process.
```

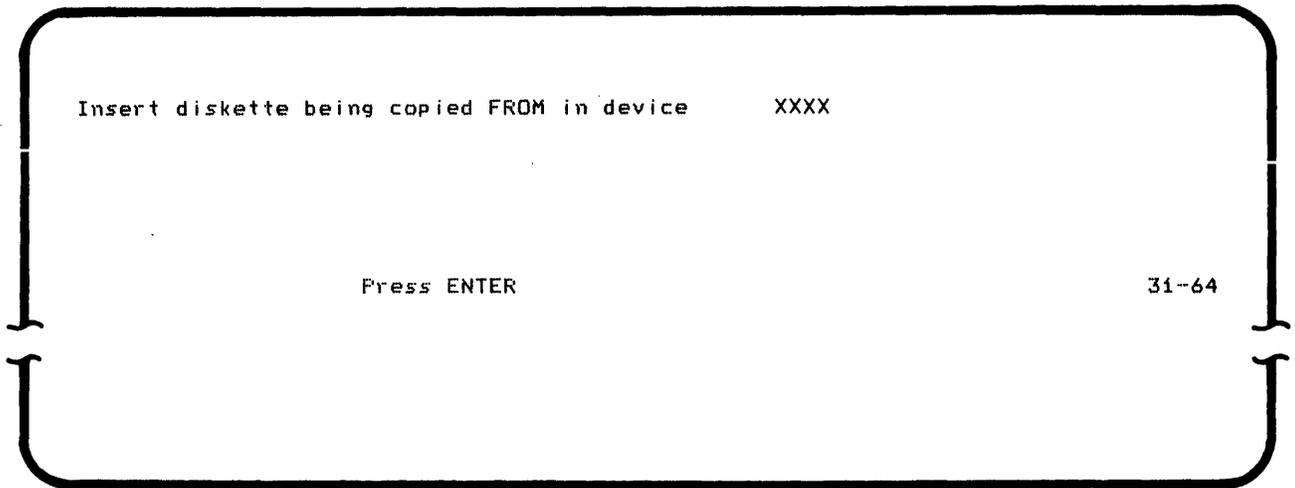
31-77

The message is displayed when the copy starts and remains displayed until it is completed. During the actual copy, all labels and the data on the tracks are copied to the output diskette or disk.

When the copy is successfully completed, the utility-completed prompt (31-78) is displayed.

## Insert the Input Diskette (31-64)

If you are using a single drive to make the copy, the following prompt is displayed:



1. Insert the input diskette at the address in the field indicated by Xs.
2. Press the Enter key.

After as much data as possible is read into storage from the input diskette, the insert output diskette prompt (31-63) is displayed.

## Insert the Output Diskette (31-63)

Insert diskette being copied TO in device

XXXX

Press ENTER

31-63

1. Remove the input diskette and insert the output diskette at the address in the field specified by the Xs.
2. Press the Enter key.

The data read into storage from the input diskette is written to the output diskette. If there is more data on the input diskette to be copied, the previous two prompts (31-64 and 31-63) are redisplayed until the copy is completed. Then the utility-completed prompt (31-78) is displayed.

If the Cmd, End-of-Job key sequence is used during execution of the single drive image copy function, or if the copy is terminated because of an error, the utility will attempt to restore the input and output diskettes to their precopy condition. Prompts 31-64 and 31-63 may be displayed during the restoration process. The status line on prompt 31-63 or 31-64 displays the error code and the message **SYSCOPY in termination**. The data in your input data set remains unchanged.

If the Cmd, End-of-Job key sequence is used during the termination process, the utility terminates immediately and the contents of the output data set may be inaccessible. When the termination completes the utility-terminated prompt is displayed.

## Image Copy Completed (31-78)

When the image copy is successfully completed, the utility-completed prompt (31-78) is displayed, allowing you to exit the utility or restart the image copy function. If you restart the image copy, the input diskette prompt (31-61) is redisplayed. If you want to perform a different type of copy, you must exit the utility, then reload the SYSCOPY utility.

## VOLUME COPY

This copy function requires the use of two drives (for example, two diskette drives, or a diskette drive and a disk drive).

### Insert the Input Diskette (31-61)

If you select volume copy (option 2) for the specify copy option prompt (31-01), the following prompt is displayed:

```
Insert diskette to be copied FROM and enter
```

```
Device address: L1111
```

```
Data set qualifier: *****
```

```
Do you want prompting? (1=Yes,2=No): 2
```

```
Press ENTER
```

```
31-61
```

1. If necessary, insert the input diskette into a diskette drive and enter the device address.
2. If you want to copy all of the data sets on the diskette or disk, leave the asterisks in the group qualifier field.

If you want to copy only a group of data sets, enter the group qualifier for the data sets you want to copy. The group qualifier field is eight positions long. Enter the characters that correspond to the set of common characters in the data set names you want to copy. Enter an asterisk in any position where the data set names can vary. Enter trailing blanks if the data set names are less than eight characters. See "Group Data Set Qualifier Processing" on page 1-15 for more information.

3. If you want the option of displaying each data set name and choosing to copy or not copy the data set, enter a 1.
4. Press the Enter key.

If the diskette or disk is volume-protected, prompt 05-01 is displayed. If a volume-protected disk also has protected data sets, you can copy all of the data sets by entering the volume owner ID. If you enter blanks for the owner ID, you will be prompted to enter a password for each protected data set. Enter the owner ID or password to continue.

After the utility accepts the input diskette or disk, the output diskette prompt (31-62) is displayed.

**Note:** If you copy password-protected data sets to a diskette, the password is not copied.

### Insert the Output Diskette (31-62)

After the input diskette or disk is accessed, the following prompt is displayed:

```
Insert diskette to be copied TO and enter
Device address: L| | | |
```

Press ENTER

31-62

1. If necessary, insert the output diskette into a diskette drive and enter the device address.
2. Press the Enter key.

If you selected yes, for prompting, in the insert input diskette prompt (31-61), the current data set prompt (31-24) is displayed.

If the output diskette is volume-protected, and if the owner ID is different from the input diskette owner ID, the volume-protected prompt (05-01) is displayed. Enter the owner ID and press the Enter key to continue.

If the output diskette contains allocated data sets, the add option prompt (31-23) is displayed. If the output disk contains allocated data sets, an error is displayed.

If the output device does not contain allocated data sets and you have not requested prompting, the copy process begins. The copy in process prompt (31-77) is displayed.

## Output Diskette Contains Data (31-23)

If the output diskette or disk contains data, the following prompt is displayed:

```
Output diskette contains data.
```

```
The first data set is XXXXXXXX.
```

```
Options are
```

1. Copy over existing data sets
2. Add data sets to this diskette

```
Select option: Press ENTER
```

31-23

1. Select an option.
2. Press the Enter key.

If you select option 1 to copy over existing data sets, the data sets on the output diskette are deleted. The copy begins, and the copy-in-process prompt (31-77) is displayed. You can not use this option to copy over existing data sets on a disk. If you want to copy over disk data sets, you must clear the data sets with the clear utility first.

If you select option 2 to add data sets, the data sets on the input device will be added to the output diskette or disk, beginning in the space following the last existing data set. The copy begins, and the copy in process prompt (31-77) is displayed.

If you do not want to use this diskette or disk for output, terminate the utility by using the Cmd, End-of-Job key sequence. Then restart the utility and insert a different output diskette or select a different disk.

## Current Data Set Copy (31-24)

If you have selected prompting, the following prompt is displayed for the first data set on the input diskette or disk:

The current data set is   XXXXXXXX

Options are

1. Copy this data set
2. Do not copy this data set
3. Copy all remaining data sets

Select option:   □ Press ENTER

31-24

### 1. Select an option:

- Enter a 1 to copy this data set.
- Enter a 2 if you do not want to copy this data set.
- Enter a 3 if you want to copy this data set and all of the remaining data sets and do not want to answer this prompt anymore.

### 2. Press the Enter key.

If you selected option 1, the copy begins and the copy in process prompt (31-77) is displayed. If there are more data sets to copy, this prompt will be displayed again.

If you selected option 2, this data set is not copied. If there are more data sets to copy, the next data set is displayed.

If you selected option 3, the copy in process prompt (31-77) is displayed.

If you do not want to copy any remaining data sets from the input diskette or disk, use the Cmd, End-of-Job key sequence to end the utility.

## Volume Copy in Process (31-77)

While the copy is in process, the following prompt is displayed:

```
SYSCOPY in process.
```

31-77

The copy utility copies all valid selected data sets and labels on the input diskette or disk to the output diskette or disk. Deleted data sets and labels are not copied; the space between the data sets is compressed.

Data sets are allocated on the output device while the copy is in process. The newly allocated data sets have the same record lengths as the corresponding data sets on the input device. The exchange types are also the same as for the data sets on the input device if possible; otherwise, I exchange data sets are allocated. If an I exchange data set is allocated and the input data set is not I exchange, the specify delete character prompt (31-65) is displayed.

Prompt 05-01 is displayed if you are copying a password-protected disk data set and have not entered a volume owner ID for the disk.

If the utility attempts to allocate a data set and there is either no more space for data set labels or no more space for data sets, the output diskette full prompt (31-22) is displayed.

If the utility runs out of space on the output device while copying a data set, the multivolume prompt (31-66) is displayed. If there is not enough room to allocate a continued multivolume data set on the output device, an error occurs and the utility is terminated. (In this case, data copied to the previous volume remains, but no data is copied to this volume.)

When the volume copy has copied all the selected input data sets and labels to the output diskette(s) or disk(s), the utility completed prompt (31-78) is displayed.

**Note:** An IPL data set must be copied to an empty diskette or disk because the IPL data set must be the first data set. Do not copy IPL data sets with the group qualifier or prompting functions.

## Specify the Record Delete Character (31-65)

If an input data set is basic or H exchange and the output data set is I exchange, the following prompt is displayed:

Specify the record delete character for data set

XXXXXXXXXXXXXXXXXX

Enter character:   |

Press ENTER

31-65

1. Specify a unique delete character, one that will never appear in the last position of a valid record. Valid delete characters are A through Z and . , ; & # \* - @ \$ % and 0 through 9. You can specify a blank (no entry) if there will be no deleted records.
2. Press the Enter key.

The data set is allocated and the copy begins. The copy in process prompt (31-77) is displayed.

## Output Diskette is Full (31-22)

If the utility runs out of space on the output diskette or disk while attempting to allocate an output data set, the following prompt is displayed:

```
Copy output diskette is full.
Insert next diskette in device
```

```
XXXX.
```

```
Press ENTER
```

```
31-22
```

1. If necessary, insert the next output diskette.
2. Enter the device address of the next output diskette or disk. (The previous device address is displayed as a default.)
3. Press the Enter key.

If the diskette or disk is volume-protected, and the owner ID differs from the previous owner ID, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key to continue.

The utility continues copying input data sets to the next output diskette or disk. The copy in process prompt (31-77) is redisplayed.

## Do You Want to Use Multivolume Output Support (31-66)

When the copy requires the use of additional output diskettes or disks (for the output data set), the following prompt is displayed:

```
End of volume, copy OUTPUT data set XXXXXXXXXXXXXXXXXXXX Volume: XX
Do NOT remove diskette until next screen is displayed.
Do you want multivolume support?
 1. Yes 2. No
Select option: Press ENTER 31-66
```

The first line of the prompt displays the name of the data set being copied and the number of the volume to which the data set was being copied.

**Warning:** Do not remove the output diskette until the next prompt is displayed or data may be lost.

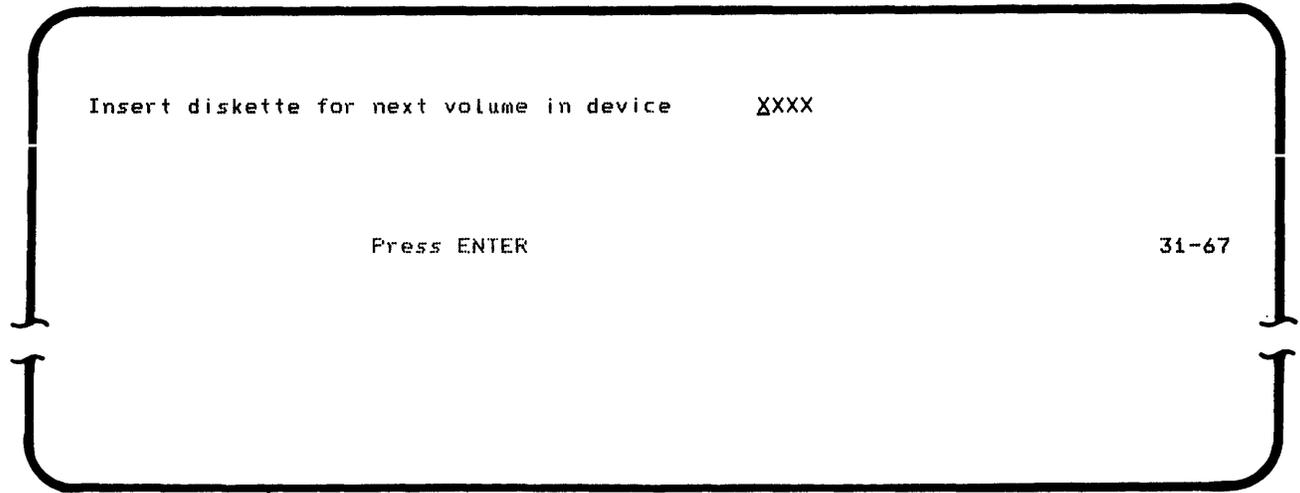
1. Enter a 1 if you want to use an additional output diskette or disk, or a 2 if you do not.
2. Press the Enter key.

If you select option 1, the data set is continued on the next diskette or disk. The insert next volume prompt (31-67) is displayed.

If you select option 2, the portion of the data set already copied is deleted from the output diskette or disk and the utility-terminated prompt (31-79) is displayed. Any data sets completely copied to the output device before termination are not deleted.

## Insert Diskette for Next Volume (31-67)

If you select multivolume support, the following prompt is displayed:



Any additional output diskettes or disks must have the same sector size and initialization as the initial output diskette or disk.

1. If necessary, remove the full output diskette and insert the next output diskette.
2. Enter the device address of the next output diskette or disk. (The previous device address is displayed as a default.)
3. Press the Enter key.

If the next output diskette is volume-protected, with a different owner ID than the previous output diskette, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key to continue.

If you require additional output diskettes or disks, the multivolume prompts (31-66 and 31-67) will be displayed as needed to complete the copy.

The copy in process prompt (31-77) is redisplayed.

## Volume Copy Completed (31-78)

When the copy is successfully completed, the completed prompt (31-78) is displayed allowing you to restart another volume copy or exit from the utility.

If you restart the volume copy, the input diskette prompt (31-61) is displayed. If you want to perform a different type of copy, you must exit from the utility, then reload the SYSCOPY utility.

## DATA SET COPY

### Specify the Input Data Set(s) (31-31)

If you selected option 3 in the select copy option prompt (31-01), the following prompt is displayed:

```
Enter the following for input x
Data set name: □□□□□□□□
Device address:

Press ENTER to continue 31-31
```

1. Enter the name of the input data set and the device address of the input data set.
2. Press the Enter key.

The first time the preceding prompt is displayed, a 1 is displayed for the input number. The second time a 2 is displayed, and so on, for up to four data sets. All input data sets must have the same record length.

If less than four input data sets are to be copied when you have entered all your data sets, make no entries for the next prompt. The data set(s) already specified will be copied.

If the diskette is volume-protected, or the data set is password-protected, prompt 05-01 is displayed. Enter the owner ID or password and press the Enter key to continue.

The first input data set is opened, and the include/omit prompt (31-32) is displayed.

## Specify Include/Omit (31-32)

Once the first input data set is opened, the following prompt is displayed:

```
Do you want to use include/omit?
```

```
Options are
```

```
1. Yes
```

```
2. No
```

```
Select option: Press ENTER
```

```
31-32
```

1. Select an option.
2. Press the Enter key.

Include/omit allows you to include or insert deleted records and/or omit marked records in copies. If include/omit is not used, all records except deleted records will be copied. The insert output diskette prompt (31-70) is then displayed. If you use include/omit, the copy deleted records prompt (31-68) is displayed.

## Copy Deleted Records (31-68)

Should copy include deleted records?

Options are

1. Yes
2. No

Select option:  Press ENTER

31-68

**Note:** This prompt is not displayed if there is only one input data set that is I exchange, and the data set does not have a delete character.

1. Specify whether you want the deleted records that are in the input data set to be copied to the output data set.
2. Press the Enter key.

If you select option 1 to include deleted records, you cannot also specify to insert deleted records. The omit marked records prompt (31-35) is displayed.

If you select option 2, the insert deleted records prompt (31-33) is displayed.

## Insert Deleted Records (31-33)

If you did not select the include deleted records option, the following prompt is displayed:

```
Do you want to insert deleted records?
```

```
Options are
```

```
1. Yes
```

```
2. No
```

```
Select option: Press ENTER
```

```
31-33
```

1. Specify whether to insert deleted records into the output data set.
2. Press the Enter key.

If you select option 1, the specify frequency prompt (31-34) is displayed. If you select option 2, the omit marked records prompt is displayed.

## Specify the Frequency of Deleted Records (31-34)

If you specified the insert deleted records option, the next prompt is displayed:

Specify the number of data records between deleted records:

|||

Press ENTER

31-34

1. Specify the number of valid data records you want between each deleted record.
2. Press the Enter key.

The frequency determines how many data records are copied before a deleted record is inserted. For example, if you specify 5, then five records will be copied followed by a deleted record, then another five records will be copied followed by a second deleted record, and so on until the copy is completed.

The omit marked records prompt (31-35) is displayed.

## Will Copy Omit Marked Records (31-35)

Should copy omit marked records?

Options are

1. Yes
2. No

Select option:  Press ENTER

31-35

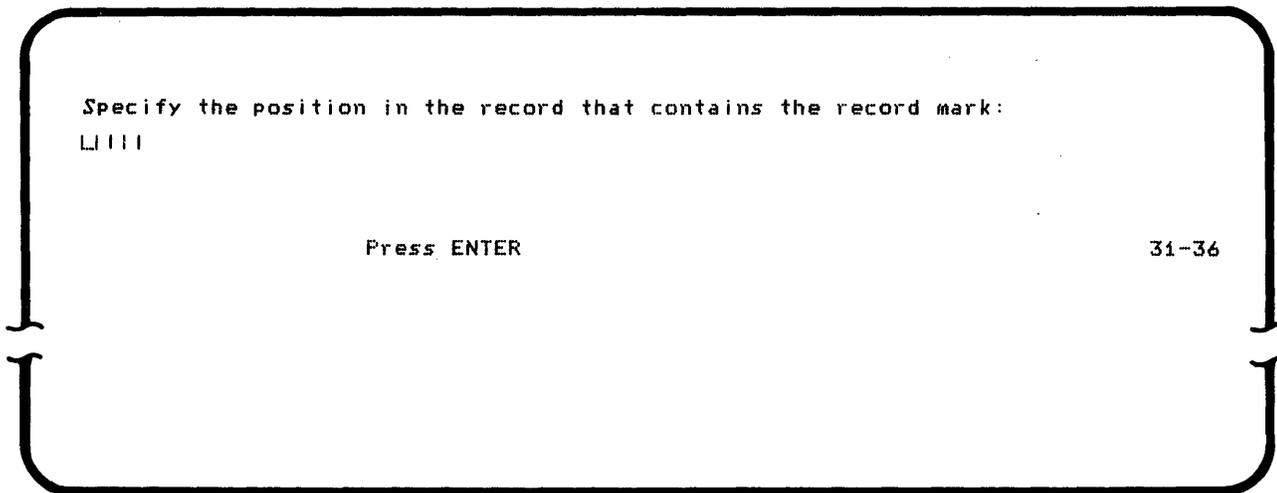
1. Specify whether or not to omit marked records.
2. Press the Enter key.

Marked records are marked by the DE/RPG keyword MARK with the character E in the mark position. See the IBM 5280 DE/RPG Reference Manual, SC21-7787, for more information.

If you select option 1, the mark position prompt (31-36) is displayed. If you select option 2, the insert output diskette prompt (31-70) is displayed.

## Specify the Mark Position in the Record (31-36)

If you omit marked records from the copy, the following prompt is displayed:



1. Specify the position in the record where the record mark can be found.
2. Press the Enter key.

The insert output diskette prompt (31-70) is displayed.

## Insert Output Diskette (31-70)

After the data set copy options are determined, the following prompt is displayed:

```
Insert diskette to be copied TO and enter
Data set name: Llllllllll
Device address:

 Press ENTER 31-70
```

1. If necessary, insert the output diskette into a diskette drive.
2. Enter the name of the output data set. (If the output data set has already been allocated, it must have the same record length as the input data sets.)
3. Enter the device address.
4. Press the Enter key.

If the output diskette is volume-protected and the owner ID is different than the last owner ID specified, or a data set is password-protected, prompt 05-01 is displayed. Enter the owner ID or password and press the Enter key to continue.

If the output data set contains data, the data set contains data prompt (31-37) is displayed.

If the output data set cannot be found, the data set not found prompt (31-71) is displayed.

When the output data set is successfully accessed, the copy begins and the copy in process prompt (31-77) is displayed.

## Output Data Set Contains Data (31-37)

If the output data set contains data, the following prompt is displayed:

Output data set contains data.

Options are

1. Copy over existing data
2. Add to existing data

Select option:  Press ENTER

31-37

1. Select an option.
2. Press the Enter key.

This prompt warns you that the specified output data set contains data. If you select option 1, all the existing data will be dropped; the utility will write the output starting at the beginning of the data set. If you select option 2 to add to the existing data, the utility will write the output starting at the end of the existing data.

If the output data set is write-protected, or is an unexpired data set, you cannot copy over the data it contains; an error occurs and the utility is terminated.

When the copy process begins, the copy in process prompt (31-77) is displayed.

## Output Data Set Not Found (31-71)

If the output data set cannot be found on the output device, the following prompt is displayed:

```
Data set to be copied to not found.
```

```
Do you want it allocated?
```

```
Options are
```

```
1. Yes 2. No
```

```
Select option: Press ENTER
```

```
31-71
```

1. Select an option.
2. Press the Enter key.

If you select option 1, an output data set will be allocated using the logical record length, the exchange type, and the delete character of the first input data set. If the first input data set is an exchange type other than basic, H, or I, an I exchange type data set will be allocated. When an I exchange output data set is allocated and deleted records are being included or inserted, and if the first input data set is an I exchange data set with no delete character specified, the delete character prompt (31-65) is displayed.

**Note:** The space allocated will only be large enough to contain the actual data to be copied. If a larger data set or a different exchange type is needed, you must allocate the data set before you start the copy. You can use the label maintenance utility to preallocate the data set space.

If you select option 2, the insert output diskette prompt (31-70) is redisplayed.

Be sure the correct output diskette is inserted into the specified drive and that the data set name is correctly spelled.

When the data set space has been allocated, the copy begins and the copy in process prompt (31-77) is displayed.

## Specify the Record Delete Character (31-65)

The following prompt is displayed only if an output data set is being allocated, the first input data set is an I exchange data set without a delete character, and deleted records are to be included or inserted.

```
Specify the record delete character for data set
XXXXXXXXXXXXXXXXXX
Enter character: U
```

Press ENTER

31-65

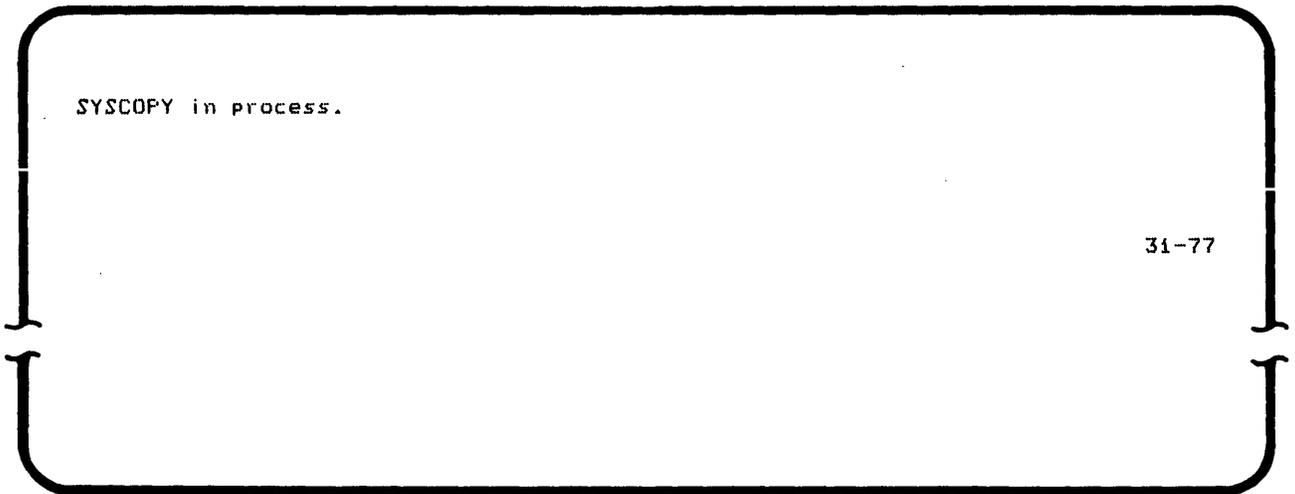
The name of the data set to be copied is displayed in the field indicated by the Xs.

1. Specify a unique delete character, one that will never appear in the last position of a valid record. Valid delete characters are: A through Z and . , ; & # \* - @ % and 0 through 9.
2. Press the Enter key.

The data set is allocated and the copy begins. The copy in process prompt (31-77) is displayed.

## Data Set Copy in Process (31-77)

While the copy is in process, the following prompt is displayed:



The utility copies the input data set(s) to the output data set.

If the output device becomes full before the complete input data set has been copied, the multivolume prompt (31-66) is displayed.

If the input data sets are not all online (inserted into diskette drives), the processing will be interrupted when another input diskette should be inserted. After you press the Reset key, you will be reprompted for the data set name and device address (31-31). Insert the diskette into the specified diskette drive and press the Enter key.

When the copy is successfully completed, the utility-completed prompt (31-78) is displayed.

## Specify Whether to Use Multivolume Input Support (31-38)

If any one of the four input data sets is multivolume, the following prompt is displayed:

```
End of volume, copy INPUT data set XXXXXXXXXXXXXXXXXXXX Volume: XX
Options are
 1. Insert diskette for next volume in device XXXX
 2. Terminate input for data set
Select option: Press ENTER 31-38
```

- If you want to copy other volumes:
  1. If necessary, insert the diskette containing the next sequential volume in a diskette drive. (The previous device address is displayed as a default.)
  2. Enter the device address of the diskette or disk if it is different than the default.
  3. Enter 1 and press the Enter key.

If it is not the next sequential volume in the series, an error occurs and prompt 31-38 is redisplayed. Otherwise, the copy begins and the copy in process prompt (31-37) is redisplayed.
- If you do not wish to copy other volumes of this data set, enter a 2 in the option field and press the Enter key. The copy continues with the next input data set. If all input data sets have been processed, the utility-completed prompt (31-78) is displayed.

## Specify Whether to Use Multivolume Output Support (31-66)

When the data set on the current output diskette or disk is filled and there is more data to be copied, the following prompt is displayed:

```
End of volume, copy OUTPUT data set XXXXXXXXXXXXXXXXXXXX Volume: XX
Do NOT remove diskette until next screen is displayed.
Do you want multivolume support?
 1. Yes 2. No
Select option: Press ENTER 31-66
```

The first line of the prompting message displays the name of the data set being copied and the number of the volume to which the data set was being copied.

**Warning:** Do not remove the current output diskette until the next prompt is displayed or data may be lost.

1. Enter a 1 if you want to use an additional output diskette or disk, or a 2 if you do not.
2. Press the Enter key.

If you enter a 1, the data set is continued on the next output diskette or disk. The insert next volume prompt (31-67) is displayed.

If you enter a 2, the utility is terminated. The output data set and its label will be freed (deleted) if it was allocated by the copy utility. If you are copying over existing data, the data set contents are dropped (erased). If you are adding data to an existing data set, the data set is restored to its precopy condition. The utility-terminated prompt (31-79) is displayed.

## Insert Diskette for Next Volume (31-67)

If you select option 1 (in prompt 31-66), the following prompt is displayed:

```
Insert diskette for next volume in device XXXX
```

```
Press ENTER
```

```
31-67
```

Any additional output diskettes or disks must have the same sector size as the initial output diskette or disk.

1. If necessary, remove the current output diskette and insert the next output diskette.
2. Enter the device address of this output diskette or disk. (The previous device address is displayed as a default.)
3. Press the Enter key.

If the diskette is volume-protected and has a different owner ID than the previous output diskette, the volume-protected prompt is displayed. Enter the owner ID, and press the Enter key to continue.

If additional output diskettes or disks are required to complete the copy, the multivolume support prompts (prompt 31-66 and 31-67) are displayed as many times as necessary to complete the job.

The copy in process prompt (31-77) is redisplayed.

## Data Set Copy Completed (31-78)

When the data set copy is successfully completed, the utility-completed prompt (31-78) is displayed allowing you to exit from the utility or restart the data set copy function. If you restart the data set copy, the input data set 1 through 4 prompt (31-31) is displayed. If you want to perform a different type of copy, you must exit from the utility, then reload the SYSCOPY utility.

## SPECIFY RECORD COPY

### Insert Input Diskette (31-69)

If you entered option 4 in the select copy option prompt (31-01), the following prompt is displayed:

```
Insert diskette to be copied FROM and enter
Data set name: □| | | | | | | |
Device address:

 Press ENTER 31-69
```

1. If necessary, insert the input diskette into a diskette drive.
2. Enter the name of the data set to be copied and the device address.
3. Press the Enter key.

If the input diskette is volume-protected, or a data set is password-protected, prompt 05-01 is displayed. Enter the owner ID or password and press the Enter key to continue.

The output data set prompt (31-70) is displayed.

## Insert Output Diskette (31-70)

Insert diskette to be copied TO and enter

Data set name:    □□□□□□□□

Device address:

Press ENTER

31-70

1. If necessary, insert the output diskette into a diskette drive.
2. Enter the name of the data set to which you want to copy the data. Then enter the device address to be used for output.
3. Press the Enter key.

If the diskette is volume-protected and has an owner ID that is different from the one for the input diskette, or the disk data set is password-protected, prompt 05-01 is displayed. Enter the owner ID or password and press the Enter key to continue.

If the output data set cannot be found on the diskette or disk, the data set not found prompt (31-71) is displayed.

If the input data set is I exchange and there is no delete character specified in the data set label, the specify record numbers prompt (31-46) is displayed. Otherwise, the deleted records prompt (31-68) is displayed.

## Output Data Set Not Found (31-71)

If the specified output data set cannot be found, the following prompt is displayed:

```
Data set to be copied to not found.
```

```
Do you want it allocated?
```

```
Options are
```

```
1. Yes 2. No
```

```
Select option: Press ENTER
```

```
31-71
```

1. Select an option.
2. Press the Enter key.

If you select option 1, an output data set will be allocated using the logical record length, the exchange type, and the delete character of the input data set. The specify record numbers prompt (31-46) is displayed.

If you select option 2, the output data set prompt (31-70) is redisplayed.

## Copy Deleted Records (31-68)

If the input data set is basic, H, or I exchange (and the I exchange data set label contains a delete character), the following prompt is displayed:

Should copy include deleted records?

Options are

1. Yes
2. No

Select option:       Press ENTER

31-68

**Note:** If the input data set is I exchange and the label contains no delete character, the preceding prompt is not displayed.

1. Specify whether to include deleted records in the copy.
2. Press the Enter key.

The specify record numbers prompt (31-46) is displayed.

## Enter Relative Record Numbers of the Records to be Copied (31-46)

After you have accessed the output data set, the following prompt is displayed:

```
Enter relative record number of FIRST record to be copied: | | | | | | | |
Enter relative record number of LAST record to be copied:

 Press ENTER 31-46
```

1. Specify the relative record number of the first record you want to be copied.
2. Specify the relative record number of the last record you want to be copied. If you leave this field blank, all remaining records in the data set are copied.
3. Press the Enter key.

The copy begins and the copy in process prompt (31-77) is displayed.

## Copy in Process (31-77)

While the copy is in process, the following prompt is displayed:

```
SYSCOPY in process.
```

31-77

The records are copied to the output data set, beginning with the record specified as the first record to be copied, and including the record specified as the last record to be copied.

If the output diskette or disk becomes full before all the records are copied, the multivolume prompt (31-66) is displayed.

When the records have been successfully copied, the utility-completed prompt (31-78) is displayed.

## Specify Whether You Want Multivolume Output Support (31-66)

If an output diskette or disk cannot hold all of the data to be copied, the following prompt is displayed:

```
End of volume, copy OUTPUT data set XXXXXXXXXXXXXXXXXXXX Volume: XX
Do NOT remove diskette until next screen is displayed.
Do you want multivolume support?
 1. Yes 2. No
Select option: Press ENTER 31-66
```

The first line of the prompting message displays the name of the data set being copied and the number of the volume to which the data set was being copied.

**Warning:** Do not remove the current output diskette until the next prompt is displayed. The diskette alarm will sound and data may be lost.

1. Enter a 1 if you want to use an additional output diskette or disk, or 2 if you do not.
2. Press the Enter key.

If you enter a 1, the data set is continued on the next output diskette or disk. The insert next volume prompt (31-67) is displayed.

If you enter a 2, the utility is terminated. The output data set and its label will be freed (deleted) if it was allocated by the copy utility. If the data set was preallocated, the data set is restored to its precopy condition. The utility-terminated prompt (31-79) is displayed.

## Insert Diskette for Next Volume (31-67)

If you select option 1 (in prompt 31-66), the following prompt is displayed:

```
Insert diskette for next volume in device XXXX
```

```
Press ENTER
```

```
31-67
```

Any additional output diskette or disk must have the same sector size as the initial output diskette or disk.

1. If necessary, remove the current output diskette and insert the next output diskette.
2. Enter the device address of this diskette or disk. (The previous device address is displayed as a default.)
3. Press the Enter key.

If the diskette is volume-protected and has a different owner ID than the previous output diskette, the volume-protected prompt is displayed. Enter the owner identifier and press the Enter key.

If additional output diskettes or disks are required to complete the copy, the multivolume support prompts (prompts 31-66 and 31-67) are displayed as many times as necessary to complete the job.

The copy in process prompt (31-77) is redisplayed.

## Specify Record Copy Completed (31-78)

When the specify record copy is successfully completed, the utility-completed prompt (31-78) is displayed allowing you to exit from the utility or restart the specify record copy. If you restart the specify record copy, the insert input diskette prompt (31-69) is displayed. If you want to perform a different type of copy, you must exit from the utility, then reload the SYSCOPY utility.

## SPECIFY KEY COPY

### Insert Input Diskette (31-69)

If you enter option 5 in the specify copy option prompt (31-01), the following prompt is displayed:

```
Insert diskette to be copied FROM and enter
Data set name: L| | | | | | | |
Device address:

 Press ENTER 31-69
```

1. If necessary, insert the input diskette into a diskette drive.
2. Enter the name of the input data set and the device address.
3. Press the Enter key.

If the diskette is volume-protected, or the data set is password-protected, prompt 05-01 is displayed. Enter the owner ID or password, and press the Enter key to continue.

The insert output diskette prompt (31-70) is displayed.

## Insert Output Diskette (31-70)

Insert diskette to be copied TO and enter

Data set name:   □□□□□□□□

Device address:

Press ENTER

31-70

1. If necessary, insert the output diskette into a diskette drive.
2. Enter the name of the output data set and device address.
3. Press the Enter key.

If the diskette is volume-protected and has a different owner ID from the input diskette, or the disk data set is password protected, the prompt 05-01 is displayed. Enter the owner ID or password and press the Enter key to continue.

If the output data set cannot be found on the diskette or disk, the data set not found prompt (31-71) is displayed. Otherwise, the specify field location prompt (31-51) is displayed.

## Output Data Set Not Found (31-71)

If the specified data set cannot be found, the following prompt is displayed:

```
Data set to be copied to not found.
Do you want it allocated?
Options are
1. Yes 2. No
Select option: Press ENTER
```

31-71

1. Select an option.
2. Press the Enter key.

If you select option 1, an output data set will be allocated using the same exchange type, logical record length, and delete character as the input data set. The specify field location prompt (31-51) is displayed.

If you select option 2, the output diskette prompt (31-70) is redisplayed.

## Specify Field Location (31-51)

```
Enter location and length of field X
Location: L| | | | Length:
Enter key:
Enter comparison condition (1=GT,2=LT,3=EQ,4=GE,5=LE,6=NE):
 Press ENTER
```

31-51

1. Specify the location and length of the key field. Location is the number of characters, from the beginning of the record, where the field starts. Length is the number of characters in the field, up to a maximum of 16.
2. Specify the key value. The key is the value to which the contents of the field are compared. The comparison will start at the left most positions of the key and of the field. This utility performs character string comparisons, therefore if the keys or the field contents are negative numeric values, unexpected results may occur. The maximum length of the key is 16 characters. The key length must equal the field length. Blanks are valid characters to use as key values.
3. Specify the comparison condition you want to use. Valid comparison conditions are:

|                   |                               |
|-------------------|-------------------------------|
| Greater than (GT) | Greater than or equal to (GE) |
| Less than (LT)    | Less than or equal to (LE)    |
| Equal (EQ)        | Not equal to (NE)             |
4. Press the Enter key.

The preceding prompt may appear up to three times (the X in the first line equals 1, 2, or 3) so you can specify up to 3 keys. You must specify values for all the parameters of the prompt the first item it appears (field 1). If you do not want to specify a second or third field, make no entry and press the Enter key.

If you specify only one key field, the copy begins and the copy in process prompt (31-77) is displayed. If you specify two or three key fields, the specify logical relation prompt (31-52) is displayed.

## Specify Logical Relation Using AND/OR (31-52)

If you specified more than one field, the following prompt is displayed:

```
What logical relation do you want?
```

```
Options are
```

1. AND
2. OR

```
Select option: Press ENTER
```

```
31-52
```

An AND relationship indicates that all the fields specified must satisfy their respective comparison condition(s) for the record to be copied.

An OR relationship indicates that only one of the fields specified must satisfy its comparison condition for the record to be copied.

1. Select an option.
2. Press the Enter key.

The copy begins, and the copy in process prompt (31-77) is displayed.

## Specify Key Copy in Process (31-77)

While the copy is in process, the following prompt is displayed:

`SYSCOPY in process.`

31-77

All records in the input data set that meet the specifications are copied to the output data set.

If the output diskette or disk becomes full before all the records that meet the specifications are copied, the multivolume prompt (31-66) is displayed.

When the copy is successfully completed, the utility-completed prompt (31-78) is displayed.

## Specify Whether You Want Multivolume Output Support (31-66)

If an output diskette or disk cannot hold all of the data to be copied, the following prompt is displayed:

```
End of volume, copy OUTPUT data set XXXXXXXXXXXXXXXXXXXX Volume: XX
Do NOT remove diskette until next screen is displayed.
Do you want multivolume support?
 1. Yes 2. No
Select option: Press ENTER 31-66
```

The first line of the prompting message displays the name of the data set being copied and the number of the volume to which the data set was being copied.

**Warning:** Do not remove the current output diskette until the next prompt is displayed or data may be lost.

1. Enter a 1 if you want to use an additional output diskette or disk, or a 2 if you do not.
2. Press the Enter key.

If you enter a 1, the data set is continued on the next output diskette or disk. The insert next volume prompt (31-67) is displayed.

If you enter a 2, the utility is terminated. The output data set and its label will be freed (deleted) if it was allocated by the copy utility. If the output data set was preallocated, the data set is restored to its precopy condition. The utility-terminated prompt (31-79) is displayed.

## Insert Diskette for Next Volume (31-67)

If you select option 1 (in prompt 31-66), the following prompt is displayed:

```
Insert diskette for next volume in device XXXX
```

```
Press ENTER
```

```
31-67
```

Any additional output diskette or disk must have the same sector size as the initial output diskette or disk.

1. If necessary, remove the current output diskette and insert the next output diskette.
2. Enter the device address. (The previous device address is displayed as a default.)
3. Press the Enter key.

If the diskette is volume-protected and has a different owner ID than the previous output diskette, or the disk data is password-protected, prompt 05-01 is displayed. Enter the owner ID or password, and press the Enter key to continue.

If additional output diskettes or disks are required to complete the copy, the multivolume support prompts (prompts 31-66 and 31-67) are displayed as many times as necessary to complete the job.

The copy in process prompt (31-77) is redisplayed.

## Specify Key Copy Completed (31-78)

When the specify key copy is successfully completed, the utility-completed prompt (31-78) is displayed allowing you to exit from the utility or restart the specify key copy. If you restart the specify key copy, the insert input diskette prompt (31-69) is redisplayed. If you want to perform a different type of copy, you must exit from the utility, then reload the SYSCOPY utility.

## SINGLE DRIVE DATA SET COPY

### Insert Input Diskette (31-69)

If you enter option 6 in the select copy option prompt (31-01), the following prompt is displayed:

```
Insert diskette to be copied FROM and enter
Data set name: □□□□□□□□
Device address:

 Press ENTER 31-69
```

1. Insert the input diskette into a diskette drive.
2. Enter the name of the data set to be copied and the address of the diskette drive.
3. Press the Enter key.

If the input diskette is volume-protected, the volume-protected prompt is displayed. Enter the owner ID, and press the Enter key to continue.

The insert output diskette prompt (31-16) is displayed.

## Insert Output Diskette (31-16)

After you access the input diskette, the following prompt is displayed:

```
Insert diskette to be copied TO in device XXXX and enter
Data set name: X|XXXXXXXX
```

Press ENTER

31-16

1. Insert the output diskette at the address in the field indicated by the Xs.
2. Enter the name of the output data set. The output data set must be preallocated. The copied data is added to any existing data on the output data set.
3. Press the Enter key.

If the output diskette is volume-protected and the owner ID is different from the owner ID for the previous diskette, the volume-protected prompt is displayed. Enter the owner ID, and press the Enter key to continue.

The insert input diskette prompt (31-64) is displayed.

## Insert Input Diskette in Specified Device (31-64)

After the output diskette is accessed, the following prompt is displayed:

```
Insert diskette being copied FROM in device XXXX

 Press ENTER 31-64
```

1. Insert the input diskette at the address in the field specified by the Xs.
2. Press the Enter key.

The input data set is opened, and as many records as possible are read into storage. Then the data set is closed, and the insert output diskette prompt (31-63) is displayed.

## Insert Output Diskette in Specified Device (31-63)

```
Insert diskette being copied TO in device XXXX
```

```
Press ENTER
```

```
31-63
```

1. Remove the input diskette and insert the output diskette at the address in the field indicated by the Xs.
2. Press the Enter key.

The output data set is opened, and the records that were read from the input diskette are written to the output diskette.

Prompts 31-64 and 31-63 will continue to be displayed until all the data in the input data set is copied to the output data set.

Each time the input or output diskette is reinserted into the diskette drive, the copy utility checks to determine whether the correct diskette is inserted. If the check determines that the wrong diskette was inserted, an error occurs. Insert the correct diskette and press the Reset key to continue.

When the copy is successfully completed, the utility-completed prompt (31-78) is displayed.

If the Cmd, End-of-Job key sequence is used during execution of the copy, the utility will attempt to restore the diskettes to their precopy condition. Prompts 31-64 and 31-63 may be displayed during the restoration process. The status line on prompt 31-63 or 31-64 displays the error code and the message **SYSCOPY in termination**. If the Cmd, End-of-Job key sequence is used during the restoration process, the utility terminates immediately and no further restoration is attempted.

## Single Drive Data Set Copy Completed (31-78)

When the copy is successfully completed, the utility-completed prompt (31-78) is displayed allowing you to exit from the utility or restart the single drive data set copy. If you restart the single

drive data set copy, the insert input diskette prompt (31-69) is redisplayed. If you want to perform a different type of copy, you must exit from the utility, then reload the SYSCOPY utility.



## CHAPTER 6. THE PRINT UTILITY (SYSPRINT)

The print utility prints a single data set, a group of data sets, or all data sets on a diskette or disk. Five print functions are available.

- Diskette/group print: All the data sets on a diskette or disk are printed, or you can specify a group of data sets to print. See "Group Data Set Qualifier Processing" on page 1-15.
- Data set print: A single data set is printed. Multivolume data sets are supported for this print function only. (See the note on page 6-2.)
- Specify record print: A group of records within a data set is printed. You specify the first and last records to be printed.
- Specify key print: Records are printed if they meet the conditions you specify. Up to three conditions can be used in a logical AND/OR relationship.
- Hexadecimal print: All or part of a data set is printed in hexadecimal characters. You specify the first and last relative records to be printed. See "Hexadecimal Print Example" on page 6-17 for a format example.

Two format-control methods are available.

- Print by record. A new line is started for each record. The print utility defaults to print by record for the following print functions:
  - Specify record print
  - Specify key print
  - Hexadecimal print.

Printer format control information is set automatically for hexadecimal print. Otherwise, the following printer control information is prompted for:

- The number of characters to print per line
  - The page size (in terms of the total number of blank and printed lines)
  - The number of lines printed per page
  - Spacing (double spacing or single spacing).
- Printer control information within a data set. The printer control information can be within the records to be printed. This format-control method can be selected for a diskette/group print or a data set print. This type of print control cannot be used with ASCII diskettes.

**Note:** If the print control information is contained in a multivolume data set, and the diskette print option is used to print the data set, an error may occur when you attempt to print subsequent volumes.

From 10 to 198 characters per line can be printed, and from 1 to 255 lines per page can be printed.



## Specify the Print Option (36-01)

After the utility is loaded, the following prompt is displayed:

```
SYSPRINT -- PRINT UTILITY
Options are
 1. Diskette/Group 3. Specify record 5. Hexadecimal
 2. Data set 4. Specify key
Select option: Press ENTER 36-01
```

### 1. Select a print option:

- Enter a 1 to print a group of data sets with a common group qualifier or all the data sets on a diskette or disk.
- Enter a 2 to print all the records in one data set.
- Enter a 3 to print records in a data set by specifying the relative record numbers of the first and last records to be printed.
- Enter a 4 to select records for printing based on the values of certain fields (keys) in the records.
- Enter a 5 to print the hexadecimal representation of a data set by specifying the relative record numbers of the first and last records to be printed.

### 2. Press the Enter key.

If you select option 1 or 2, the specify print format method prompt (36-02) is displayed. If you select option 3, 4, or 5, the input data set prompt (36-04) is displayed. (The print format method will always print by record for option 3, 4, or 5.)

## Specify the Print Format to be Used (36-02)

If you specify diskette/group print or data set print (option 1 or 2 in prompt 36-01), the following prompt is displayed:

Which print format do you want?

Options are

1. Print by record
2. Data set contains printer control information

Select option:  Press ENTER

36-02

1. Select an option.
2. Press the Enter key.

With option 1 a new line is started for each record. With option 2 the data is printed as specified by print control information in the data set. You should select option 2 only if your data set contains standard character string printer control information; otherwise unexpected results may occur.

If you selected a diskette/group print (option 1) for prompt 36-01, the input diskette prompt (36-03) is displayed. If you selected a data set print (option 2) in prompt 36-01, the input data set prompt (36-04) is displayed.

## Input Diskette (36-03)

For a diskette/group print, the following prompt is displayed:

```
Insert diskette to be printed from and enter
Device address: L| | | |
Group qualifier: *****
```

Press ENTER

36-03

1. If necessary, insert the input diskette into a diskette drive and enter the device address.
2. If you want to print all of the data sets on the diskette or disk, press the Enter key.

If you want to print only a group of data sets, enter the group qualifier for the data sets you want to print. The group qualifier field is eight positions long. Enter the characters that correspond to the set of common characters in the data set names you want to print. Enter an asterisk in any position where the data set names can vary. Enter trailing blanks if the data set names are less than eight characters. See "Group Data Set Qualifier Processing" on page 1-15 for more information.

3. Press the Enter key.

If the input diskette is volume-protected or the disk data set is password-protected, prompt 05-01 is displayed. Enter the owner ID or password to continue. After you access the diskette or disk, the specify printer prompt (36-08) is displayed.

## Input Data Set (36-04)

For a data set print, specify record print, specify key print, or hexadecimal print, the following prompt is displayed:

```
Insert diskette to be printed from and enter
Data set name: L| | | | | | | |
Device address:
```

Press ENTER

36-04

If you are printing a multivolume data set (option 2 in prompt 36-01) that contains printer control information (option 2 in prompt 36-02), you must insert volume 1 of the multivolume data set. If you are printing a multivolume data set and using the print by record format (option 1 in prompt 36-02), you can insert any volume. In either case, the next diskette or disk must contain the next sequential volume.

1. If necessary, insert the input diskette into a diskette drive.
2. Enter the name of the data set to be printed and the device address.
3. Press the Enter key.

If the diskette is volume-protected, or a data set is password-protected, prompt 05-01 is displayed. Enter the owner ID or password to continue. The system opens the input data set. The next prompt to be displayed depends on the print option, as follows:

- For a data set print, the specify printer prompt (36-08) is displayed.
- For a specify record print, or hexadecimal print, the specify record prompt (36-05) is displayed.
- For a specify key print, the specify key prompt (36-06) is displayed.

## Specify Record Print (36-05)

For a specify record or hexadecimal print, the following prompt is displayed:

```
Enter relative record number of FIRST record to be printed: L| | | | | | | |
Enter relative record number of LAST record to be printed:
```

Press ENTER

36-05

1. Enter the relative record numbers of the first and last records to be printed. If blanks are entered for the last record to be printed, the system will print all the remaining records in the data set.
2. Press the Enter key.

The specify printer prompt (36-08) is displayed.

## Specify Key Print (36-06)

For a specify key print, the following prompt is displayed to specify the first key field:

```
Enter location and length of field X
Location: 1111 Length:
Enter key:
Enter comparison condition (1=GT,2=LT,3=EQ,4=GE,5=LE,6=NE):
 Press ENTER 36-06
```

1. Specify the location and length of the key field. The location is the number of characters, from the beginning of the record, where the field starts. The length is the number of characters in the field, up to a maximum of 16.
2. Specify the key value. The key is the value to which the contents of the field are compared. The comparison starts at the leftmost position of the key and of the field. The maximum length of the key is 16 characters. The key length must equal the field length. Blanks are valid characters to specify as keys.

**Note:** This utility performs character string comparison; therefore, if the keys or the field contents are negative numeric values, unexpected results may occur.

3. Specify the comparison condition you want to use. Valid comparison conditions are:

|              |      |                          |      |
|--------------|------|--------------------------|------|
| Greater than | (GT) | Greater than or equal to | (GE) |
| Less than    | (LT) | Less than or equal to    | (LE) |
| Equal        | (EQ) | Not equal to             | (NE) |

4. Press the Enter key.

This prompt may appear up to three times (the X in the first line equals 1, 2, or 3) so you can specify up to three key fields. You must specify values for all the parameters of the prompt the first time it appears (field 1). If you do not want to specify a second or third field, make no entry and press the Enter key.

If you specify only one key field, the specify printer prompt (36-08) is displayed. If you specify two or three key fields, the specify logical relation prompt (36-07) is displayed.

### Specify Logical Relation Using AND/OR (36-07)

If more than one field is specified in prompt 36-06, the following prompt is displayed:

What logical relation do you want?

Options are

1. AND

2. OR

Select option:  Press ENTER

36-07

1. Enter a 1 to specify an AND relation. Or enter a 2 to specify an OR relation.
2. Press the Enter key.

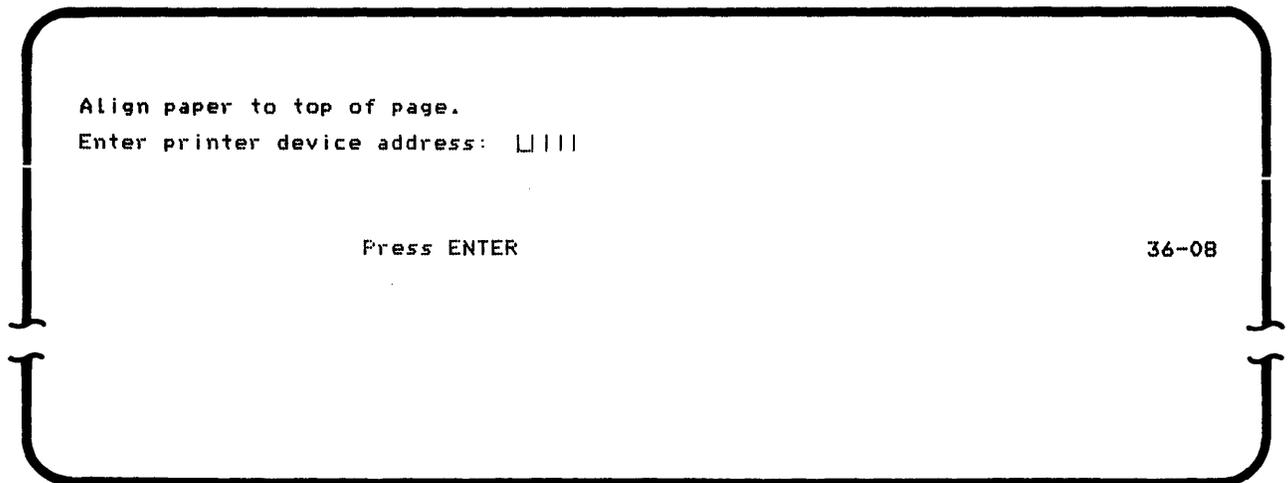
An AND relationship indicates that all the fields specified must satisfy the comparison condition for the record to be printed.

An OR relationship indicates that only one of the fields specified must satisfy the comparison condition for the record to be printed.

The specify printer prompt (36-08) is displayed.

## Specify the Printer Device Address (36-08)

The following prompt is displayed:



1. Check the paper in the printer to see if it is positioned where the first line is to be printed. If necessary, position the paper where you want the first line of printed output to be printed.
2. Make the printer ready.
3. Enter the device address of the printer that will print the data.
4. Press the Enter key.

If you are using the print by record format method, (option 1 in prompt 36-02) the specify printer control prompt (36-09) is displayed. If you are not using the print by record format method, or have specified hexadecimal print, the printing begins and the print in process prompt (36-10) is displayed.

## Specify Printer Control Information (36-09)

If the print by record format option is used, the following prompt is displayed:

Enter the following printer control information.

Characters per line (10-198):        128  
Total lines per page (1-255):        066  
Printed lines per page (1-255):      055  
Spacing (1=Single,2=Double):        1

Press ENTER

36-09

The default printer control information is displayed on the prompt.

1. Enter the print control information to format the output: the number of characters to be printed per line, the total number of lines per page (blank and printed), the total number of printed lines per page, and the spacing between lines. If you leave any of these fields blank, the default values are used.

The number of characters per line should never be greater than the print width of your printer. Double spacing must not be specified if the total lines per page is 1. Whether double spacing or single spacing is used, the printing always begins on the first line of each page.

2. Press the Enter key.

The printing begins and the print in process prompt (36-10) is displayed.

## Print in Process (36-10)

When the actual printing process starts, the following message is displayed:

```
SYSPRINT in process.
```

36-10

This message is displayed until the printing is completed. Then the utility-completed prompt (36-78) is displayed except for the following conditions:

- For a diskette/group print, if a data set cannot be opened, the data set cannot be printed prompt (36-11) is displayed.
- For a multivolume data set print, the multivolume prompt (36-12) is displayed unless the volume printed was the last volume in the series.

## Do you Want to Use Multivolume Support? (36-12)

After a continued volume of a multivolume data set has been printed, the following prompt is displayed.

```
End of volume, print input data set XXXXXXXX Volume XX
Options are
 1. Insert diskette for next volume and specify device: XXXX
 2. Terminate input for data set.
Select option: Press ENTER 36-12
```

- If you do not want to print other volumes of the data set, enter 2 and press the Enter key. The utility-completed prompt (36-78) is displayed.
- If you want to print other volumes on a diskette, insert the diskette containing the next sequential volume into a diskette drive and enter the device address.

If you want to print other volumes on a disk, enter the device address. (The previous device address is displayed as a default.)

- Enter 1 and press the Enter key.

If the data set volume cannot be opened, or if it is not the next sequential volume in the series, an error occurs and the prompt 36-12 is redisplayed. Otherwise, the printing begins, and the print in process prompt (36-10) is redisplayed.

## Data Set Cannot be Printed (36-11)

If a diskette/group print (option 1 in prompt 36-01) has started and the system encounters a data set that cannot be opened, the following message is displayed:

```
0 XXXX-3232- SYSPRINT
```

```
The following data set will not be printed. XXXXXXXX
```

```
Press ENTER
```

```
36-11
```

No entry is required. Press the Enter key to continue the next data set. The print in process prompt (36-10) is redisplayed.

### **Print Completed (36-78)**

When the printing is completed, the utility-completed prompt is displayed allowing you to exit from the utility or restart the print utility. If you restart the print utility, the specify print option prompt (36-01) is displayed.

For partitions that are smaller than 10 K bytes, the partition is automatically reloaded when you choose the restart option. Make sure that the utilities diskette is inserted in the diskette drive from which it was originally loaded before you press the Enter key. If the attempt to reload the partition is unsuccessful, the partition is exited; otherwise the specify print option prompt (36-01) is displayed.

### **Print Terminated (36-79)**

If the utility is terminated before normal completion, the utility-terminated prompt (36-79) is displayed allowing you to exit from the utility or restart the print utility. If you restart, the specify print option prompt (36-01) is displayed.

For partitions that are smaller than 10 K bytes, if the utility was terminated after the print in process prompt (36-10) was displayed, the partition is automatically reloaded when you choose the restart option. Make sure that the utilities diskette is inserted in the diskette drive from which it was originally loaded before you press the Enter key. If the attempt to reload the partition is unsuccessful, the partition is exited; otherwise, the print option prompt (36-01) is displayed.

## Hexadecimal Print Example

The hexadecimal print option automatically sets: 100 characters per line, 66 lines per page and 60 printed lines per page.

The hexadecimal print of a line of graphic characters will look like this example:

```
|-----|-----|-----|----- . . . guideline
ABCDEFGHIJKLMN OPQRST UVWXYZ 0123456789 . . . graphic characters
CCCCCCCCDDDDDDDEEEEEEE4FFFFFFF . . . first half byte of characters
1234567891234567892345678900123456789 . . . second half byte of characters
. . . blank line
|-----|-----|-----|----- . . . guideline
```



## CHAPTER 7. THE CLEAR UTILITY (SYSCLEAR)

The clear utility can drop or free a single data set, a group of data sets, or the entire contents of a diskette or disk. For example, you can write confidential data on a diskette or disk, obtain the desired results, then use the clear utility to drop or free the data. If you use a drop option, the space used by the data set remains allocated.

The clear options available are:

- Data set drop: This option changes the data set label so the space remains allocated but contains no data.
- Data set free: This option completely deletes both the data set label information and the data in a data set. The data set space is freed and can be reallocated for future use.
- Diskette/group drop: This option functions the same as data set drop but applies to either a group of data sets or all the data sets on the diskette or disk. Although the data is no longer accessible, the labels remain usable with the same data set names.
- Diskette/group free: This option functions the same as data set free, except that a group or all of the labels and data on the diskette or disk are deleted. All the deleted space can be reallocated for future use. (If you do not free all of the data sets on the diskette or disk, use the compress utility (SYSCOMP) before you reallocate space.)

With each clear option, you can also replace the data with hexadecimal zeros.

The clearing process takes longer if you are clearing a very large data set or diskette, and replacing the data with hexadecimal zeros. If you are clearing an entire diskette, you should reinitialize the diskette rather than clear the data set(s). If you reinitialize a disk, only the data set labels are deleted.

## TERMINATING THE UTILITY WITH THE CMD, END-OF-JOB KEY SEQUENCE

If you terminate the utility by using the Cmd, End-of-Job key sequence while the utility is clearing a data set, a termination-in-process prompt is displayed. This prompt remains displayed until the data set currently being cleared is completed cleared; then the utility-terminated prompt (25-79) is displayed.

All data sets that were cleared before the End-of-Job key is pressed remain cleared. The data set being cleared when the End-of-Job key is pressed is cleared; however, none of the remaining data sets on the diskette or disk are cleared.



## Specify the Clear Option (25-01)

After the utility is loaded, the following prompt is displayed:

```
2 0001 D 01 40
SYSCLEAR - CLEAR UTILITY
Options are
 1. Data set drop 3. Diskette/Group drop
 2. Data set free 4. Diskette/Group free
Select option: Press ENTER
```

25-01

### 1. Select an option:

- Enter a 1 to change the data set label so the space remains allocated but contains no data.
- Enter a 2 to delete both the data set label information and the data in a data set. The data set space is freed and can be reallocated.
- Enter a 3 to change all the data set labels or a group of data set labels. The space remains allocated for the dropped data sets but contains no data.
- Enter a 4 to delete both the data set labels and the data in a group of data sets or all the data sets on the diskette or disk. The data set space is freed and can be reallocated.

### 2. Press the Enter key.

The data clear prompt (25-02) is displayed.

## Do You Want the Data Cleared? (25-02)

Do you want data portion cleared?

Options are

1. Yes
2. No

Select option:  Press ENTER

25-02

### 1. Select an option.

- If you specify yes, all the character positions in the data set are reset to hex 00. You should use this option for data security reasons only, because it takes considerable time to execute.
- If you specify no, the character positions remain unchanged.

### 2. Press the Enter key.

If you selected data set drop or free for the specify clear option prompt (25-01), the insert data set diskette prompt (25-04) is displayed. If you selected diskette/group drop or free, the insert diskette prompt (25-12) is displayed.

## DISKETTE/GROUP CLEAR

### Insert the Diskette to be Cleared (25-12)

For a diskette/group drop or free (option 3 or 4 in prompt 25-01), the following prompt is displayed:

```
2 0001 N 04 40
Insert diskette with data sets to be cleared and enter
Device address: □| | |
Group qualifier: *****
```

Press ENTER

25-12

1. If necessary, insert the diskette containing the data sets to be cleared.
2. Enter the device address.
3. If you want to drop or clear all of the data sets on the diskette or disk, press the Enter key.

If you want to drop or clear only a group of data sets, enter the group qualifier for the data sets you want to drop or clear. The group qualifier field is eight positions long. Enter the characters that correspond to the set of common characters in the data set names you want to process. Enter an asterisk in any position where the data set names can vary. Enter trailing blanks if the data set names are less than eight characters. See "Group Data Set Qualifier Processing" on page 1-15 for more information.

If the diskette or disk is volume-protected, prompt 05-01 is displayed. If a volume-protected disk also has protected data sets, you can clear all of the data sets by entering the volume owner ID. If you enter blanks, for the owner ID, you will be prompted to enter a password for each protected data set. Enter the owner ID and press the Enter key to continue.

If the first data set on the diskette or disk is unexpired, the diskette is unexpired ALL prompt (25-11) is displayed.

If the first data set on the diskette is write-protected, the diskette write-protected ALL prompt (25-10) is displayed.

If all the data sets are to be cleared, the clear ALL data sets prompt (25-13) is displayed.

Otherwise, the diskette clear in process prompt (25-07) is displayed.

### Clear ALL Data Sets (25-13)

If all data sets on a diskette or disk are to be cleared, the following prompt is displayed:

```
2 0001 D 01 40
All data sets are to be cleared from diskette on device XXXX.
Do you want to continue?
Options are
 1. Yes 2. No
Select option: Press ENTER 25-13
```

1. Select an option.
2. Press Enter.

If option 1 is selected, the clear begins and the clear in process prompt (25-07) is displayed.

If you select option 2, the data sets are not cleared and the insert diskette to be cleared prompt (25-12) is redisplayed.

## Data Set Write-Protected All (25-10)

If a data set is write-protected and you want ALL write-protected data sets cleared, the following prompt is displayed:

```
The following data set is write protected. XXXXXXXX
Do you want ALL write protected data sets cleared?
Options are
 1. Yes 2. No
Select option: Press ENTER 25-10
```

1. Select an option.
2. Press the Enter key.

If option 1 is selected, the clear utility deletes ALL write-protected features from the label of the specified data set. The clear begins and the clear in process prompt (25-07) is displayed. When ALL write-protected data sets are cleared, prompt (25-11) is displayed.

With a data set drop or free operation, clearing ALL write-protected data sets bypasses the checking for any other write-protected data sets. All write-protected data sets are cleared.

If you select option 2, prompt (25-06) will be displayed.

## Data Set is Unexpired All (25-11)

If a data set is unexpired and you want ALL unexpired data sets cleared, the following prompt is displayed only if all write-protected data sets are cleared:

```
The following data set is unexpired. XXXXXXXX
Do you want ALL unexpired data sets cleared?
Options are
 1. Yes 2. No
Select option: Press ENTER 25-11
```

1. Select an option.
2. Press the Enter key.

If option 1 is selected, the clear utility deletes ALL write-protected features from the label of the specified data set. The clear begins and the clear in process prompt (25-07) is displayed.

If you select option 2, prompt (25-06) will be displayed.

## Data Set Not Cleared (25-06)

```
0 4400-XXXX- SYSCLAE3 xxxxxxxxxxxxxxxxxxxx
```

```
The following data set was not cleared. xxxxxxxxxxxxxxxxxxxx
```

Press ENTER

25-06

Press the Enter key. The utility continues and the clear in process prompt (25-07) is displayed.

If an error occurs while the utility is attempting to open a data set, while the utility is in process, the data set not cleared prompt (25-06) is redisplayed after you press the Enter key. The utility continues attempting to clear the remaining data sets on the diskette, or disk and the clear in process prompt (25-07) is redisplayed.

## Clear in Process (25-07)

While the data sets are being cleared from the diskette or disk, the following prompt is displayed:

```
SYSCLEAR in process.
```

25-07

If a write-protected data set is encountered after the clear begins, the data set write-protected ALL prompt (25-10) is displayed.

If an unexpired data set is encountered after the clear begins, the data set is unexpired ALL prompt (25-11) is displayed.

If a password-protected disk data set is encountered after the clear begins, and the volume owner ID has not been entered, prompt 05-01 is displayed. Enter the password and press the Enter key to continue.

If an error occurs while the utility is attempting to open a data set, the data set not cleared prompt (25-06) is displayed.

If the clear is successfully completed, the utility-completed prompt (25-78) is displayed.

## Utility Completed (25-78)

When the clear process is successfully completed, the utility-completed prompt (25-78) is displayed allowing you to exit from the utility or restart the clear utility. If you restart the utility, the specify clear option prompt (25-01) is displayed.

## DATA SET CLEAR

### Insert the Diskette with the Data Set to be Cleared (25-04)

For a data set drop or free (option 1 or 2 in prompt 25-01), the following prompt is displayed:

```
Insert diskette to be cleared and enter
Data set name: L| | | | | | | |
Device address:
```

Press ENTER

25-04

1. If necessary, insert the diskette with the data set to be dropped or freed.
2. Enter the name of the data set.
3. Enter the device address.
4. Press the Enter key.

If the diskette is volume-protected, or a data set is password-protected, prompt 05-01 is displayed. Enter the owner ID or password, and press the Enter key to continue.

If the data set is write-protected, the write-protected prompt (25-05) is displayed.

If the data set is unexpired, the data set unexpired prompt (25-09) is displayed.

Otherwise, the clear begins and the clear in process prompt (25-07) is displayed.

## Data Set Write-Protected (25-05)

If a data set is write-protected, the following prompt is displayed:

```
The following data set is write protected. PAYROLL1
Do you want data set cleared?
Options are
 1. Yes 2. No
Select option: Press ENTER 25-05
```

1. Select an option.
2. Press the Enter key.

If option 1 is selected, the clear utility deletes the write protect feature from the label of the specified data set. The clear begins and the clear in process prompt (25-07) is displayed.

If you select option 2, the data set is not cleared, and prompt (25-06) is displayed.

## Data Set Unexpired (25-09)

If a data set is unexpired, the following prompt is displayed:

```
The following data set is unexpired. XXXXXXXX
Do you want data set cleared?
Options are
 1. Yes 2. No
Select option: Press ENTER 25-09
```

1. Select an option.
2. Press the Enter key.

If option 1 is selected, the clear utility deletes the unexpired feature from the label of the specified data set. The clear begins and the clear in process prompt (25-07) is displayed.

If you select option 2, the data set is not cleared, and prompt (25-06) is displayed.

## Data Set Not Cleared (25-06)

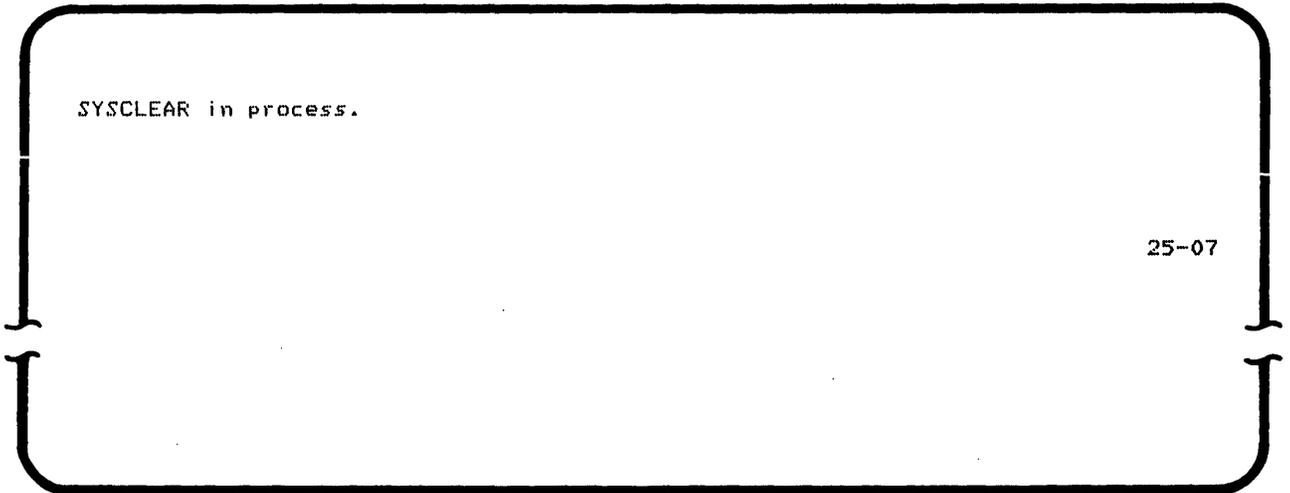
```
0 XXXX-3234 SYSCLEAR
The following data set was not cleared. XXXXXXXX

 Press ENTER 25-06
```

Press the Enter key. The data set specified in the preceding prompt is not cleared and the utility-completed prompt is displayed.

## Data Set Clear is in Process (25-07)

When the clear process starts, the following prompt is displayed:



The preceding message lets you know the actual clearing is in process. The message remains displayed until the clear is completed. Then the utility-completed prompt (25-78) is displayed.

## Utility Completed (25-78)

When the clear process is successfully completed, the utility-completed prompt (25-78) is displayed allowing you to exit from the utility or restart the clear utility. If you restart the utility, the specify clear option prompt (25-01) is displayed.



## CHAPTER 8. THE INITIALIZATION UTILITY (SYSINIT)

On a diskette, the initialization utility clears data, reformats the sector size, locates defective cylinders and allocates additional data set label space for 2D diskettes. On a disk, the initialization utility clears the data set labels and allocates additional data set label space.

### DISKETTE INITIALIZATION

Although each diskette obtained from IBM has already been initialized, you might want to perform initialization for one of the following reasons:

- A diskette was exposed to a strong magnetic field, and the data can no longer be read.
- A defect has occurred in one or two cylinders, and you want to assign spare cylinders to replace the defective cylinders.
- You want to change the format of a diskette (number of sectors per track and bytes per sector) to change the diskette capacity. For example, you can change 128-byte sector sizes to 256-byte sector sizes.
- You want to increase the data set label area of a diskette 2D.

Diskette initialization always performs the following:

- Formats the diskette.
- Creates and writes the ERMMap label. This label is used to record the location of any defective cylinders. A diskette can be used if it has up to two defective cylinders. If more than two cylinders are defective, the diskette should not be used.
- Creates and writes the volume label on the diskette.
- Sets aside space for the data set labels.
- Writes the ID field for each sector.
- Writes data and reads it back on all tracks. This is done to locate any defective areas on the diskette. When a defective area is found, one of the spare cylinders is automatically assigned to replace the defective one. If more than two cylinders are defective, the utility terminates and the diskette should not be used.

In addition, the initialization can extend the space used for data set labels on a diskette 2D.

## Diskette Formats

Diskettes are initialized into various formats. The format of a diskette determines:

- The number of sectors per cylinder
- The number of bytes per sector
- The sector sequence
- The number of available data set labels.

Nine different diskette formats are available. The following chart shows the formats available for each diskette type. (Disk format is also shown here for comparison.)

|             | Format Number | Tracks per Cylinder | Sectors per Track | Sectors per Cylinder | Bytes per Sector | Sector Sequence Number | Total Storage in Bytes |
|-------------|---------------|---------------------|-------------------|----------------------|------------------|------------------------|------------------------|
| Diskette 1  | 1             | 1                   | 26                | 26                   | 128              | 01-13                  | 246 272                |
|             | 2             | 1                   | 15                | 15                   | 256              | 01-08                  | 284 160                |
|             | 3             | 1                   | 8                 | 8                    | 512              | 01-04                  | 303 104                |
| Diskette 2  | 4             | 2                   | 26                | 52                   | 128              | 01-13                  | 492 544                |
|             | 5             | 2                   | 15                | 30                   | 256              | 01-08                  | 568 320                |
|             | 6             | 2                   | 8                 | 16                   | 512              | 01-04                  | 606 208                |
| Diskette 2D | 7             | 2                   | 26                | 52                   | 256              | 01-13                  | 985 088                |
|             | 8             | 2                   | 15                | 30                   | 512              | 01-08                  | 1 136 640              |
|             | 9             | 2                   | 8                 | 16                   | 1024             | 01-04                  | 1 212 416              |
| Disk        | A             | 4                   | 32                | 128                  | 256              | 01                     | 9 928 704              |

Figure 8-1. Diskette and Disk Formats

You can use the label list utility to check the format number of a diskette volume.

Each diskette obtained from IBM has already been initialized. The diskette has a colored label that indicates the sector size used when the diskette was initialized.

| Label Color             | Bytes per Sector |
|-------------------------|------------------|
| White with black print  | 128              |
| Red with white print    | 256              |
| Blue with white print   | 512              |
| Yellow with black print | 1024             |

Recommended formats are format 1 and format 7. Format 1 is recommended for a diskette 1. The diskette 1 can be used for basic and I data exchange. Format 7 is recommended for a diskette 2D. The diskette 2D can be used for H and I data exchange.

### Sector Sequence Number

The sector sequence number column in the preceding format chart contains the valid entries for the sequence-number field. This field modifies the normal sequencing of the sectors on the diskette. For example, assume format 1 and a sector sequence number of 02. The sectors for cylinders 1 through 74 would be numbered as follows: 1, 3, 5, ... 23, 25, 2, 4, ... 24, 26. For a format 1 and sector sequence number of 9, the sectors are alternately numbered as follows: 1, 10, 19, 2, 11, 20, 3, 12, 21, 4, 13, 22 and so on. This may enable you to read sector 1, process the data, and get ready to read sector 2 before the diskette rotates past sector 2. Sequentially numbered sectors are recommended for use in cases where performance is critical.

The index cylinder and any extended label cylinders always have sequential sectors.

**Note:** The sector sequence number must be blank or 1 for basic exchange data sets.

### **Additional Data Set Labels for a Diskette 2D**

Additional cylinders may be used for labels with format 7, 8 or 9. (I exchange data sets allow additional labels with format 7 only.) Each additional cylinder provides space for 104 additional labels. You should consider providing additional space for labels only if you plan to use many small data sets on the diskette. Because a cylinder assigned for additional labels cannot be used for data, assigning additional cylinders for labels reduces the number of cylinders that can be used for data. It also greatly increases the time required to open a data set. Therefore, additional label space is not recommended unless you are sure you need more than 71 labels.

If you use a diskette 2D, a displayed prompt lets you specify additional space for data set labels. The valid entries are blank

and digits one through nine. The number of labels and the diskette space provided by each entry are listed in the following chart.

| Entry | Number of Labels | Cylinders Used |
|-------|------------------|----------------|
| blank | 71               | 0              |
| 1     | 175              | 0 and 1        |
| 2     | 279              | 0 through 2    |
| 3     | 383              | 0 through 3    |
| 4     | 487              | 0 through 4    |
| 5     | 591              | 0 through 5    |
| 6     | 695              | 0 through 6    |
| 7     | 799              | 0 through 7    |
| 8     | 903              | 0 through 8    |
| 9     | 1007             | 0 through 9    |

### ASCII and EBCDIC Diskettes

The IBM 5280 normally records diskettes using EBCDIC (extended binary coded decimal interchange code). Other codes cannot be read or written by the IBM 5280 system unless they are first translated to (or from) EBCDIC. If your system is configured to allow translation from ASCII, the utility displays a prompt that allows you to initialize ASCII diskettes.

### DISK INITIALIZATION

You can use the initialization utility to increase the data set label area on a disk and clear the existing data set labels.

Disk initialization always does the following:

- Creates and writes the volume label on a disk
- Deletes existing data set labels
- Sets aside space for the data set labels

In addition, the initialization utility can extend the space used for data set labels and volume-protect the disk. See "The Disk Volume-Protected Prompt" on page 1-13 for more information on volume protection.

**Note:** When you initialize a disk, any existing data sets are then inaccessible. The data remains physically on the disk, but cannot be accessed because the data set labels are deleted. If you need the data cleared for security purposes, you must use the clear utility.

Each disk obtained from IBM is pre-formatted and initialized. The initialization utility does not reformat a disk. The disk format is:

- Format number: X'A'
- Tracks per cylinder: 4
- Sectors per track: 32
- Sectors per cylinder: 128
- Cylinders per disk: 306
- Bytes per sector: 256
- Sector sequence number: 01
- Total storage in bytes: 9 928 704

For more information on disks, see the System Concepts Manual.

The initialization utility does not check for defective cylinders on a disk.



## Insert the Diskette to be Initialized (21-01)

After the utility is loaded, the following prompt is displayed:

```
SYSINIT - INITIALIZE UTILITY
Insert diskette to be initialized and enter
Device address: □□□□
```

Press ENTER

21-01

1. If necessary, insert the diskette to be initialized into a diskette drive.
2. Enter the device address.
3. Press the Enter key.

The system attempts to access the diskette or disk to be initialized. If the diskette or disk contains allocated data sets, the initialize nonblank diskette prompt (21-02) is displayed.

If the disk is volume-protected, the volume-protected prompt (05-01) is displayed. Enter the owner ID, and press Enter to continue.

If the disk is not volume-protected, but contains password-protected data sets, prompt 21-13 is displayed.

## Initialize Nonblank Diskette (21-02)

Diskette is non-blank.

The first data set is    XXXXXXXX

Do you want to continue?

Options are

- 1. Yes                    2. No

Select option:  Press ENTER

21-02

1. Select an option.
2. Press the Enter key.

The preceding prompt warns that the diskette or disk to be initialized might contain data.

**Warning:** If you continue the initialization, all data on the diskette or disk will be lost.

If you do not continue, prompt 21-01 is displayed again to allow insertion of another diskette or selection of a different disk drive.

**Note:** If you are unsure of the contents of the diskette or disk, use the label list utility and display the contents of the data set label. See "Chapter 4. The Label List Utility (SYSLIST)" on page 4-1.

## Disk Contains Password-Protected Data Sets (21-13)

If the disk contains password-protected data sets and the disk is not volume-protected, the following prompt is displayed:

```
O 0001 D 01 40
Disk XXXX contains password protected data sets.
Do you want to continue ?
Options are
 1. Yes 2. No
Select option: Press ENTER 21-13
```

1. Select an option.
2. Press the Enter key.

The preceding prompt warns that the disk to be initialized has password-protected data sets.

**Warning:** If you continue the initialization, all data on the disk will be lost.

If you do not continue, prompt 21-01 is displayed again to allow selection of another device address.

**Note:** If you are unsure of the contents of the disk, use the label list utility and display the contents of the data set label. See "Chapter 4. The Label List Utility (SYSLIST)" on page 4-1.

## Specify EBCDIC or ASCII (21-03)

The following prompt is displayed only if the ASCII translation table was loaded from the IPL data set.

How do you want diskette initialized?

Options are .

1. EBCDIC
2. ASCII

Select option:  Press ENTER

21-03

Specify how the diskette will be initialized and press the Enter key.

## Do You Want to Use the Same Parameters? (21-04)

If the utility has run successfully and you restart the utility, the following prompt is displayed:

```
Do you want to initialize diskette using same parameters?
```

```
Options are
```

```
1. Yes
```

```
2. No
```

```
Select option: LJ Press ENTER
```

```
21-04
```

1. Select an option.
2. Press the Enter key.

If you initialize other diskettes using the same parameters (as the previously initialized diskette), the initialization or process prompt (21-10) is displayed. Otherwise, the explanation option prompt (21-05) is displayed.

## Do You Want Explanation of Initialization Parameters? (21-05)

After the attempt to access the diskette or disk, the following prompt is displayed:

Do you want explanation of parameters?

Options are

1. Yes
2. No

Select option:  Press ENTER

21-05

1. Select an option.
2. Press the Enter key.

If you enter a 2, the initialization parameters prompt (21-08) is displayed.

If you enter a 1, the first explanation prompt (21-06) for diskette, or (21-07) for disk is displayed.

## Explanation of Format Number, Diskette Type and Sector Size (21-06)

Format numbers (diskette type-sector size).

|          |          |            |
|----------|----------|------------|
| 1. 1-128 | 4. 2-128 | 7. 2D- 256 |
| 2. 1-256 | 5. 2-256 | 8. 2D- 512 |
| 3. 1-512 | 6. 2 512 | 9. 2D-1024 |

Press ENTER

21-06

The preceding message is informational only. However, because you must enter a format number later (and possibly make other entries), please note the number of the format to be used in initializing the diskette.

Format numbers 1, 2, and 3 can be used with a diskette 1; format numbers 4, 5, 6 can be used with a diskette 2; and format numbers 7, 8 and 9 can be used with a diskette 2D.

Press the Enter key.

The second explanation prompt (21-07) is displayed.

## Explanation of Sequence Number, Volume ID and Owner ID (21-07)

If you are initializing a diskette, this prompt is displayed:

```
Sequence number is optional. Default is 1 (sequential).
Volume-ID may be six alphanumeric characters. Default is 'VOLID'.
Owner-ID may be fourteen alphanumeric characters. Default is 'OWNERID'.
```

Press ENTER

21-07

If you are initializing a disk, this prompt is displayed:

```
Format number is A for disk.
Sequence number is 1 for disk.
Volume-ID may be six alphanumeric characters. Default is "VOLID".
Owner-ID may be fourteen alphanumeric characters. Default is "OWNERID".
```

Press ENTER

21-07

The preceding message explains the initialization parameters. The information in the explanation prompts (21-06 and 21-07) can be used to respond to the initialization parameters prompt (21-08). You might want to make a note of the information in the preceding prompt.

Press the Enter key.

The initialization parameters prompt (21-08) is displayed.

## Specify the Initialization Parameters (21-08)

Specify the initialization parameters in the following prompt:

```
Enter initialization parameters
```

```
Format number: LI
```

```
Sequence number:
```

```
Volume-ID:
```

```
Owner-ID:
```

```
Press ENTER
```

```
21-08
```

1. Select the format number. The format number for diskette can be from 1 through 9 (see prompt 21-06). With the IBM 5280, formats 1 and 7 are recommended for diskettes 1 and 2D respectively.

If you are initializing a disk, the utility displays the format number X'A' as information only. (You cannot change the disk format number.)

2. Select the sector sequence. The sector sequence number must specify either a sequential or nonsequential sector sequence. To specify a sequential sector sequence, enter a 1 or leave the field blank. To specify a nonsequential sector sequence, enter a value from the Sector Sequence Number column in the format chart (see "Diskette Formats" on page 8-2). For example, if you are initializing a diskette 2D to format 7, you could enter 13. If you are using basic exchange, this field must be 1 or blank.

If you are initializing a disk, the utility displays the sector sequence number 01 as information only. (You cannot change the disk sequence number.)

3. Enter a volume ID (diskette or disk name). Up to six alphanumeric characters can be used for the name. If you do not enter a volume ID, this name defaults to VOLID.
4. Enter an owner ID. A maximum of 14 characters can be used in the owner identifier field. If you do not enter an owner ID, this field defaults to OWNERID.

If you are initializing a diskette 2D or disk, the volume-protected prompt (21-12) is displayed followed by prompt 21-09. If you are not initializing a diskette 2D, only prompt 21-12 is displayed.

## Do You Want Diskette Volume-Protected? (21-12)

Specify whether you want the diskette or disk volume-protected by selecting one of the options below:

Do you want diskette volume protected?

Options are

1. Yes

2. No

Select option:  Press ENTER

21-12

- If you want the diskette or disk volume-protected, enter a 1 and press the Enter key. (The utility enters the volume-protect character in the accessibility field of the volume label.)
- If you do not want the diskette or disk volume-protected, enter a 2 and press the Enter key.

The specify additional data set labels prompt (21-09) is displayed for diskette 2D or disk. Otherwise, prompt (21-10) is displayed.

## Specify Additional Data Set Labels (21-09)

If you are initializing a diskette 2D, after you specify the initialization parameters, this prompt is displayed:

Choose number of data set labels. Blank entry allots 71.

Options are

- |        |        |         |
|--------|--------|---------|
| 1. 175 | 4. 487 | 7. 799  |
| 2. 279 | 5. 591 | 8. 903  |
| 3. 383 | 6. 695 | 9. 1007 |

Select option:  Press ENTER

21-09

**Note:** The performance of a diskette may be affected when more than 71 labels are specified.

If you are initializing a disk, after you specify the initialization parameters, this prompt is displayed:

Choose number of data set labels. Blank entry allots 249.

Options are

- |         |         |         |
|---------|---------|---------|
| 1. 505  | 4. 1273 | 7. 2041 |
| 2. 761  | 5. 1529 | 8. 2297 |
| 3. 1017 | 6. 1785 | 9. 2553 |

Select option:  Press ENTER

21-09

1. Enter the option number corresponding to the number of labels to be written on the diskette or disk. If you do not want additional labels, do not make an entry.
2. Press the Enter key.

The initialization process begins, and the initialization in process prompt (21-10) is displayed.

## Initialization in Process (21-10)

`SYSINIT in process.`

21-10

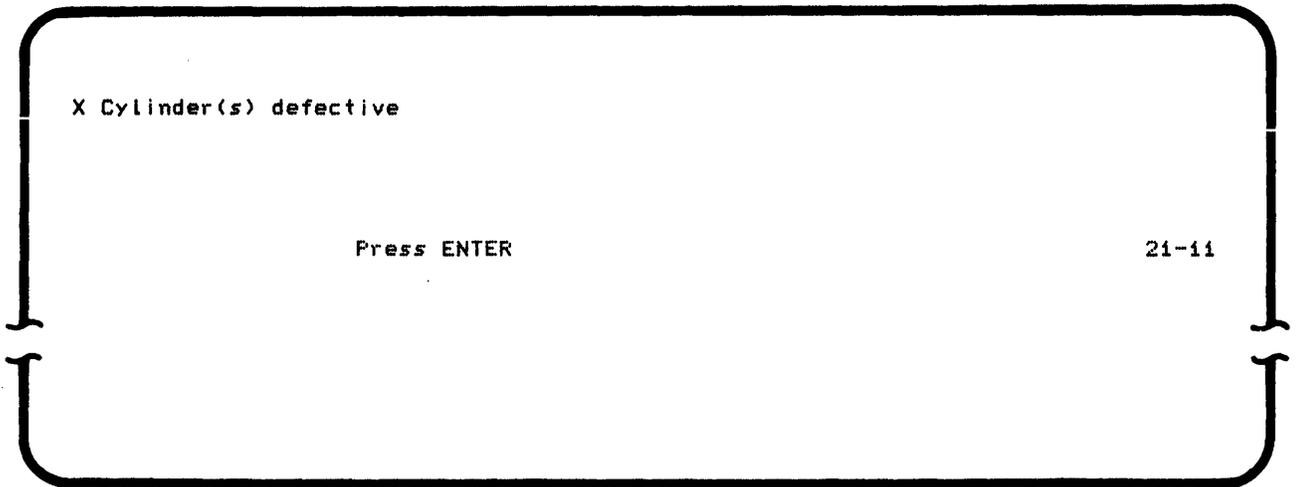
This prompt remains displayed until the initialization process is completed or terminated.

If you are initializing a diskette and initialization completes successfully, the defective cylinders prompt (21-11) is displayed. If the diskette contains more than two defective cylinders, or if cylinder 0 (the index cylinder) is defective, the initialization cannot complete; the utility terminated prompt is displayed.

If you are initializing a disk and initialization completes successfully, the utility-completed prompt (21-78) is displayed.

## Number of Defective Cylinders (21-11)

If the initialization process completes successfully, the following prompt is displayed:



The preceding message lets you know whether or not the initialized diskette has defective cylinders. If it has defective cylinders, the number of defective cylinders is displayed in column one of the message, where the X is shown. No more than two defective cylinders are allowed on a diskette.

Press the Enter key.

The utility-completed prompt (21-78) is displayed.

## Utility Completed (21-78)

When the initialization successfully completes, the utility-completed prompt (21-78) is displayed allowing you to exit from the utility or restart the initialization utility. If you restart the utility to initialize a different diskette or disk, the insert diskette prompt (21-01) is displayed.



## CHAPTER 9. THE RESOURCE ALLOCATION UTILITY (SYSRAU)

The resource allocation utility allows you to add or change the four-digit physical device addresses or the two-character logical device identifiers (IDs) in the resource allocation table. The resource allocation table contains the logical device IDs that were specified for the physical devices on the system when the system was configured. The logical device IDs can be used instead of the physical device addresses in user-written DE/RPG or sort/merge programs. This way, your programs can be executed independently of hardware configurations. For example, if you are using a printer to print output, instead of using the four-digit physical device address, such as 8000, the program can use the logical device ID, such as P1, to specify the printer. The output will be printed on the printer defined as P1 in the resource allocation table.

The resource allocation utility also allows you to change the values in the maximum disk allocation table. The values in the maximum disk allocation table are entered with the system configuration program (SYSCON) and can only be changed with the resource allocation utility. See the System Control Programming Reference/Operation Manual for more information about the maximum disk allocation table.

### RESOURCE ALLOCATION TABLE ENTRIES

Two kinds of entries can be made to the resource allocation table: partition entries and system-shared entries.

**Partition entries** are logical device identifiers for devices that are commonly used by a partition. Only the partition with which the device is associated can use the partition entry. For example, the entry for partition 1 can specify D1 as the logical device ID for diskette drive 4000, and the entry for partition 2 can specify D1 as the logical device ID for drive 4400. If a program uses D1 as the logical device ID, diskette drive 4000 is used when the program is executed in partition 1, and drive 4400 is used when the program is executed in partition 2.

**System-shared entries** are logical device identifiers for devices that are shared by all partitions in a system. For example, if D1 is specified as a system-shared entry for diskette drive 4000, programs that are executing in any partition can read or write to diskette drive 4000 by specifying D1 as the logical device ID. Or if P1 is specified as a system-shared entry for printer 8008, programs that are executing in any partition can print data on printer 8008 by using P1 as the logical device ID.

The following is an example of how the resource allocation table might look.

| Physical Device Address | Logical Device Identifiers | Entry Type        |
|-------------------------|----------------------------|-------------------|
| 4000                    | D1                         | Partition 0 entry |
| 4400                    | D2                         | Partition 1 entry |
| 4800                    | D1                         | Partition 2 entry |
| 5000                    | D1                         | Partition 3 entry |
| 4000                    | D2                         |                   |
| 4400                    | D3                         | System-Shared     |
| 4800                    | D4                         | Entries           |
| 5000                    | D1                         |                   |
| 8000                    | P1                         |                   |

New entries can be written to the table only if additional space was allocated during system configuration. The changes to the table can be temporary; only storage is modified. Or the changes can be permanent; the user-defined IPL data set is modified. If the changes are permanent, the changed version of the resource allocation table is read into the system the next time the IPL diskette or disk is used to IPL the system. See the System Concepts Manual for more information about how to use the resource allocation table.

### Making Permanent Changes to the Resource Allocation Table

To make permanent changes to the table, change the device identifier and the device address or both, and write the changes to the current IPL diskette or disk (the diskette or disk containing your system configuration); use the same IPL diskette or disk and perform the IPL process for the system. Permanent changes are effective the next time you IPL the diskette or disk.

You can change, add, or remove the table entries.

When new devices are added to the system, new entries can be made to the table.

When a device ID or a physical device address is deleted from the table, the utility inserts blanks instead of the two-character logical device ID and hexadecimal zeros instead of the physical device address in the table.

## Making Temporary Changes to the Resource Allocation Table

You can make temporary changes to the resource allocation table by modifying the storage area that is associated with a partition.

To increase the amount of space set aside in the resource allocation table, use the system configuration program (see the System Control Programming Reference/Operation Manual). The device identifier and address each require a 2-byte entry. You cannot use the resource allocation utility to increase the amount of space beyond a size previously allocated during system configuration.

## The Device ID and Physical Address Formats

The logical device identifier can consist of any two characters except a double asterisk (\*\*), which is used to indicate a blank space in the table.

The physical device address must consist of four characters such as 4000, 4400, or 8000.

## The Maximum Disk Allocation Table

The maximum disk allocation table contains values that limit the available disk space that can be allocated for a data set. For example, if you are allocating a data set and request the maximum size, the system looks for a maximum allocate value for the partition and assigns that value. If the partition maximum allocate value is 0, the system looks for a maximum disk allocate value for the system-shared entry and assigns that value. If the value of the system-shared entry is also 0, the rest of the disk is allocated for the data set.

**Note:** The actual space allocated is the maximum space that is available on the disk, if this space is smaller than the maximum disk allocate value.

The system configuration program (SYSCON) enters the limit values for each partition entry and system-shared entry. You can use the resource allocation utility to make either permanent or temporary changes the maximum disk allocate value.

## OPERATION OF THE RESOURCE ALLOCATION UTILITY

### Load the Resource Allocation Utility (05-00)

To load the utility, respond to the following prompt:

```
0 0001 A 16 40
```

```
Program name: [|||||]
```

```
Device address:
```

```
Partition number:
```

```
Press ENTER
```

```
05-00
```

1. If necessary, insert the diskette containing the utility into a diskette drive.
2. Enter SYSRAU as the program name.
3. Enter the device address.
4. Enter the number of the partition where the program will be loaded. (If you do not enter a number, the partition number defaults to the number of the partition associated with the keyboard where you are working.)
5. Press the Enter key.

The utility is loaded, and the specify change prompt (35-01) is displayed.

## Specify the Kind of Change (35-01)

After the utility is loaded, the following prompt is displayed:

```
SYSRAU - RESOURCE ALLOCATION UTILITY
What kind of change do you want to make?
Options are
 1. Permanent
 2. Temporary
Select option: Press ENTER
```

35-01

1. Select an option.
2. Press the Enter key.

Permanent changes are made to the diskette or disk and you must perform the IPL process for the system for these changes to become effective. Temporary changes are made to storage and become effective when the utility completed prompt is displayed.

If you select option 1, for permanent changes, the insert IPL diskette prompt (35-02) is displayed. If you select option 2, for temporary changes, the specify temporary partition entries prompt (35-11) is displayed.

## SPECIFY PERMANENT CHANGES

### Insert the IPL Diskette for Permanent Changes (35-02)

If you make permanent changes to the resource allocation table, the following prompt is displayed:

```
Insert IPL diskette and enter
```

```
Data set name: L| | | | | | | |
```

```
Device address:
```

```
Press ENTER
```

```
35-02
```

1. If necessary, insert the appropriate user-defined IPL diskette.
2. Enter the name of the IPL data set.
3. Enter the device address of the IPL data set.
4. Press the Enter key.

The system loads the IPL data set and displays the number of partitions prompt (35-03).

## Display the Number of Partition Entries (35-03)

After you access the IPL data set, the following prompt is displayed:

```
Number of partitions XX
Number of entries XXXX

 Press ENTER 35-03
```

The preceding message displays the total number of partitions in the system and the total number of entries in the resource allocation table.

No entry is required; just press the Enter key. The rebuild entire table option prompt (35-04) is displayed.

## Specify Whether to Rebuild Entire Table (35-04)

**Note:** If you specify a complete rebuild of the resource allocation table and press the End of Job key before the rebuild is completed, all previous entries to the table on the IPL data set are lost. The utility program will not allow a partial table rebuild on that IPL data set. The space set aside for entries is still available for an entire table rebuild.

Do you want to rebuild all partitions?

Options are

1. Yes

2. No

Select option:  Press ENTER

35-04

1. Select an option.
2. Press the Enter key.

If you select option 1 to rebuild all partition entries in the table, the specify partition entries prompt (35-05) is displayed. If you select option 2, the modification option prompt (35-07) is displayed.

## Specify Permanent Partition Entries to Rebuild Table (35-05)

If you are rebuilding the entire table, the following prompt is displayed:

```
Partition X Entry XXX
Specify the following.
Logical device identifier: | |
Physical address:
Press ENTER to continue
```

35-05

The first line of the preceding prompt displays the number of the partition and the number of entries you have made for that partition. In the next lines, you can specify the logical device identifier and the physical device address of the partition entry to be changed.

1. Enter the logical device ID and the physical address.

To insert a blank entry into the table, enter two asterisks (\*\*)  
for the logical device ID, and do not enter a physical address.

2. Press the Enter key.

The first partition entries to be displayed are for partition 0. After you make all the entries for partition 0 and press the Enter key, partition 1 entries are displayed, then partition 2, and so on. This procedure will continue until all partition entries are keyed in or all available space has been used. If additional space is available after the partition entries have been entered, the system-shared entries prompt (35-06) is displayed.

**Note:** If you use all the available space before all the desired entries are placed in the table, you must rerun the system configuration program and set aside adequate space; or rerun SYSRAU and rebuild the table, this time allowing space for each partition.

If all available space (set aside during system configuration) is used before all the partition numbers have been displayed, the utility will update the IPL data set with the entries already made. The partition numbers that were not displayed and the system-shared entries will have no entries. If the maximum disk allocation table is configured, prompt 35-12 is displayed. Otherwise, the utility-completed prompt (35-78) is displayed.

## Specify Permanent System-Shared Entries to Rebuild Table (35-06)

After you make the partition entries, the following prompt is displayed:

```
System shared entry XXX
Specify the following.
Logical device identifier: LI
Physical address:
Press ENTER to continue
```

35-06

The first line of the preceding prompt displays the number of system-shared entries you have made. The system-shared entry value starts at 1 and is incremented by one each time a valid system-shared entry is made.

1. Specify the logical device identifier and the physical address.

To insert a blank entry into the table, enter two asterisks (\*\*) for the logical identifier. Leave the physical address space blank.

2. Press the Enter key.

The preceding prompt is redisplayed until you have filled the table. If you have completed your entries and the table is not full, advance the program to the next prompt by pressing the Enter key. If the maximum disk allocation table is configured, the rebuild maximum disk allocation partition entries prompt (35-12) is displayed. Otherwise, the utility-completed prompt (35-78) is displayed.

If all available space (set aside during system configuration) is used before all the system-shared entries have been displayed, the utility will update the IPL data set with the entries already made. System-shared entries that were not displayed will have no entries. If the maximum disk allocation table is configured, prompt 35-12 is displayed. Otherwise, the utility-completed prompt (35-78) is displayed.

## Rebuild Maximum Disk Allocation Partition Entries (35-12)

If you are rebuilding the entire table, the following prompt is displayed:

```
Partition X
Maximum disk allocation per request: □□□□□ K bytes
Press ENTER to continue 35-12
```

The first line of the prompt displays the number of the partition being modified.

1. Enter the value in K bytes that you want to assign for the partition entry. Valid entries are:
  - 1 to 65 535, where 1K is equal to 1024 bytes of disk storage
  - 0, if you do not wish to assign a value to the partition entry. (If you enter a 0, this partition will default to the value in the system-shared entry.)
2. Press the Enter key.

This prompt will repeat until all partition entries are complete. When all partition entries are complete, the rebuild maximum disk allocation system-shared entry prompt (35-13) is displayed.

## Rebuild Maximum Disk Allocation System-Shared Entry (35-13)

If you are rebuilding the entire table, the following prompt is displayed:

```
System shared entry
Maximum disk allocation per request: 00000 K bytes
Press ENTER to continue 35-13
```

1. Enter the value in K bytes that you want to assign for the system-shared entry. Valid entries are:
  - 1 to 65 535, where 1K is equal to 1024 bytes of disk storage
  - 0, if you do not wish to assign a value to the system-shared entry. (If you enter a 0, any partition with a 0 value will allocate the remainder of a disk. See "The Maximum Disk Allocation Table" on page 9-3.)
2. Press the Enter key.

The utility-completed prompt (35-78) is displayed.

## Select the Table Modification Option (35-07)

If you are not rebuilding the entire table (you selected option 2 from prompt 35-04), the following prompt is displayed:

Select type of modification desired.

Options are

1. Modify system shared entries
2. Modify partition entries
3. Modifications complete

Select option:  Press ENTER

35-07

1. Select an option.
2. Press the Enter key.

**Note:** If you select option 1 or 2 and are making the modifications to the table, and if you press the Cmd key and then the End of Job key, the entries for that area (system-shared or partition) are deleted. The space allocated for those entries is available for reuse.

If you select option 1, the system shared entries prompt (35-09) is displayed. If you select option 2, the partition number prompt (35-08) is displayed. If you select option 3, the utility-completed prompt (35-78) is displayed.

## Specify Permanent Changes to System-Shared Entries (35-09)

If you select to change system-shared entries in prompt 35-07, the following prompt is displayed:

```
System shared entry XXX
Modify the following if change required.
Logical device identifier: XX
Physical address: XXXX
Press ENTER to continue 35-09
```

1. If you want to change the entry, key in the new logical and physical device addresses over the displayed entry.

If you do not want to change the entry, leave the display as it is.

If you want to delete an entry and insert a blank in its place, enter two asterisks (\*\*) in the logical identifier field.

2. Press the Enter key.

If your system has more than one system-shared entry, after you look at or change the first entry and press the Enter key, prompt 35-09 is displayed again. You must view each entry before you advance to the next prompt.

After you have viewed all existing system-shared entries, the specify permanent change maximum disk allocation system-shared prompt (35-13) is displayed, if the maximum disk allocation table is configured. Otherwise, the modification option prompt (35-07) is redisplayed.

## Specify Permanent Changes to Maximum Disk Allocation System-Shared Entry (35-13)

If you select option 1, modify the system-shared entries, in prompt 35-07, the following prompt is displayed:

```
System shared entry
maximum disk allocation per request: XXXXX K bytes
Press ENTER to continue 35-13
```

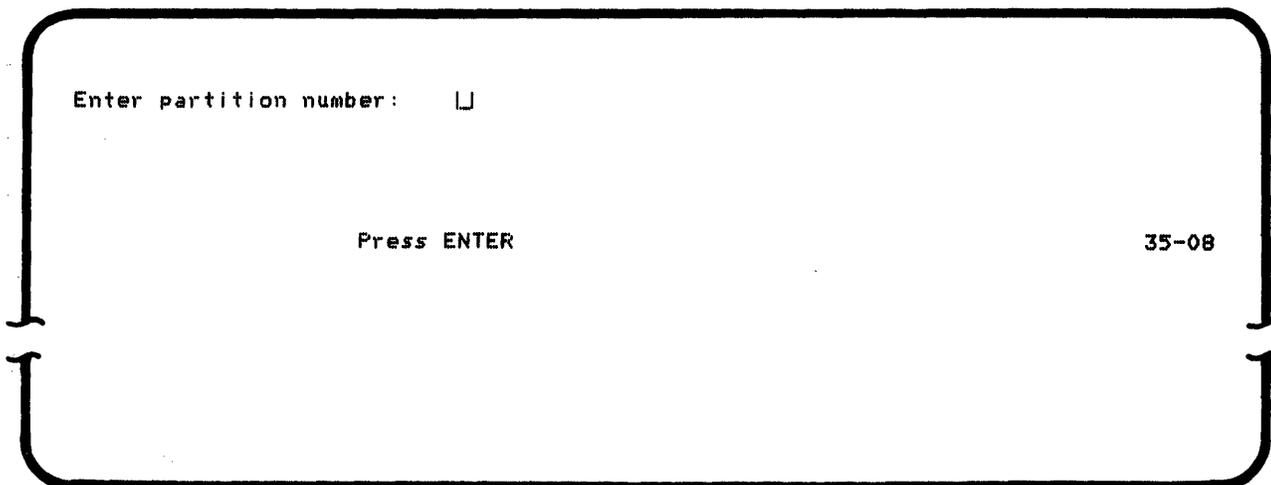
The second line shows the current maximum disk allocation for the system-shared entries as a default.

1. Enter the value in K bytes that you want to assign for the system-shared entry or press the Enter key if you do not want to change the value. Valid entries are:
  - 1 to 65 535, where 1K is equal to 1024 bytes of disk storage
  - 0, if you do not wish to assign a value to the system-shared entry. (If you enter a 0, any partition with a 0 value will allocate the remainder of a disk. See "The Maximum Disk Allocation Table" on page 9-3.)
2. Press the Enter key.

The select table modification option prompt (35-07) is redisplayed.

## Specify the Partition Number (35-08)

If you want to change only partition entries, the following prompt is displayed:

A screenshot of a terminal window showing a prompt. The text 'Enter partition number: ' is followed by a cursor symbol (a small square with a vertical line). Below this, the text 'Press ENTER' is centered, and '35-08' is displayed in the bottom right corner. The entire prompt area is enclosed in a rounded rectangular border with small hooks at the corners, suggesting it's a window or a specific display area.

Enter partition number:

Press ENTER 35-08

1. Enter the number of the partition that has entries you want to change.
2. Press the Enter key.

Partition numbers can be entered sequentially or nonsequentially. The system will display the entry for each partition in the specify permanent partition entries prompt (35-10).

## Specify Permanent Changes to Partition Entries (35-10)

If you modify partition entries, this prompt is displayed:

```
Partition X Entry XXX
Modify the following if change required.
Logical device identifier: L|I
Physical address:
Press ENTER to continue
```

35-10

In the preceding prompt, the first line displays the number of the partition where the changes are to be made, and the number of the entry. The other lines display the existing contents of the entry.

1. To change the partition entry, key in the new logical device identifier and physical address over the existing one being displayed.

If you do not want to change an entry, leave the display as it is.

If you want to delete an entry and insert a blank in its place, enter two asterisks (\*\*\*) in the logical device ID field.

2. Press the Enter key.

If your system has more than one partition entry, after you look at or change the first entry and press the Enter key, prompt 35-10 is displayed again. You must view each entry before you advance to the next prompt.

Permanent changes to partition entries become effective only after you perform an IPL with the IPL data set to which the changes were made.

After you have viewed each existing partition entry, the specify permanent changes to the maximum disk allocation partition entry prompt (35-12) is displayed, if configured. Otherwise, the modification option prompt (35-07) is redisplayed.

## Specify Permanent Changes to the Maximum Disk Allocation Partition Entry (35-12)

If you modify a partition entry, the following prompt is displayed:

```
Partition X:
Maximum disk allocation per request: XXXXX K bytes
Press ENTER to continue 35-12
```

The first line of the prompt displays the number of the partition being modified.

1. Enter the value in K bytes that you want to assign for the partition entry. Valid entries are:
  - 1 to 65 535, where 1K is equal to 1024 bytes of disk storage
  - 0, if you do not wish to assign a value to the partition entry. (If you enter a 0, this partition will default to the value in the system-shared entry.)
2. Press the Enter key.

When this partition entry is complete, the select table modification prompt (35-07) is redisplayed.

## SPECIFY TEMPORARY CHANGES

### Specify Temporary Partition Entries (35-11)

If you make temporary changes (select option 2 in prompt 35-01), the following prompt is displayed:

```
Partition X Number of entries XXX Entry XXX
Modify the following if change required.
Logical device identifier: XX
Physical address: XXXX
Press ENTER to continue 35-11
```

The preceding prompt displays the number of the partition to which changes will be made. It also displays the number of entries the partition contains and the number of the entry being made. (The number of the entry being made is set to 1 the first time the prompt is displayed.) The existing entries for the logical identifier and physical address are also displayed.

1. If you want to change an entry, key in the new logical identifier and physical device address over the displayed entries.

If you do not want to change the entry, leave the display as it is.

If you want to delete an entry and insert a blank in its place, enter two asterisks (\*\*) in the logical device ID field.

2. Press the Enter key.

The preceding prompt is redisplayed for each partition entry on the system.

Entries that are keyed in as temporary changes are lost when you perform the next initial program load.

After all the partition entries have been displayed, the maximum disk allocation partition entry prompt (35-12) is displayed, if the maximum disk allocation table has been configured. Otherwise, the utility-completed prompt (35-78) is displayed.

## Specify Temporary Maximum Disk Allocation Partition Entry (35-12)

If you are making temporary changes to the resource allocation utility the following prompt is displayed:

```
Partition X
Maximum disk allocation per request: XXXXX K bytes
Press ENTER to continue 35-12
```

The first line of the prompt displays the number of the partition being modified.

The second line displays the current maximum disk space allocation value for the partition.

1. Enter the value in K bytes that you want to assign for the partition entry. Valid entries are:
  - 1 to 65 535, where 1K is equal to 1024 bytes of disk storage
  - 0, if you do not wish to assign a value to the system-shared entry.
2. Press the Enter key.

When the partition entry is complete, the utility completed prompt (35-78) is displayed.

## UTILITY COMPLETED (35-78)

When the utility has successfully completed, the utility-completed prompt (35-78) is displayed allowing you to exit from the utility or restart the utility. If you restart the utility, the specify change prompt (35-01) is redisplayed.



## CHAPTER 10. THE SYSTEM STATUS UTILITY (SYSSTAT)

The system status utility allows you to display the current status of the IBM 5280 system and print or display the status of a user-defined IPL data set. The status of the starter system (SYSIPL on the SCP diskette) cannot be displayed or printed with this utility. See the System Control Programming Reference/Operation Manual for information about the user-defined IPL data set.

### STATUS DISPLAYED FOR THE SYSTEM

The status utility displays the following for the system:

- The name of the job that is currently operating each partition
- The types of partitions on the system, indicated by F for foreground, B for background, C for controlled, and N for noncontrolled
- The foreground partition that has loaded the background partition
- The size of each partition, in multiples of 1024 characters
- Partition maximum disk allocation values (if configured)
- System-shared maximum disk allocation values (if configured).

The partitions are numbered 0 through 7.

### STATUS DISPLAYED FOR A USER-DEFINED IPL DATA SET

The status utility displays the following for a user-defined IPL data set:

- The IPL data set name, SYSIPLxx, where xx is user-defined during system configuration
- System size of the IBM 5280 system for which the configuration was designed
- Common functions size
- Common functions data set name
- Whether or not disk error log support is provided in the configuration

- Number of application microprocessors defined in the configuration (1 or 2)
- Whether or not the system uses ASCII diskettes
- Whether or not the system displays the date prompt following an IPL
- Number of diskette or disk drive devices specified in the configuration
- Whether or not the BSC multipoint monitor has been provided for in the configuration
- Whether or not the BSC multipoint monitor program has been installed
- Number of printers, with the machine number and physical address of each printer
- The types of partitions on the system, indicated by F for foreground and B for background
- The partition maximum disk allocation values
- The system-shared maximum disk allocation value
- The size of each partition, in multiples of 1024 characters
- Application microprocessor assignments to partitions
- Names of programs to load following an IPL
- Default device addresses for load prompts for foreground partitions
- The keyboard types and display sizes
- The keyboard languages used
- The resource allocation table entries (if a resource allocation table is used).

The common functions options are: SYSDPRT2, SYSCFA, SYSHELP, or SYSJJCFA with approximate sizes of 6K, 15K, 16K, and 22K respectively. SYSCFA or SYSHELP must be used with the key entry utility, DE/RPG, and IBM 3270 Emulation. SYSJJCFA must be used with the IBM 5280 Procedure Control Language licensed program.

The printer information consists of the number of printers attached to the system, the type numbers, and their physical address.

The partition types are displayed as F (foreground) or B (background).

The keyboard types, the display sizes, and the number of the languages are also displayed. See the "Appendix A. Language/Keyboard Chart" on page A-1.

You can update the current status information by pressing the Enter key.

**Note:** The status of the starter system (SYSIPL on the SCP diskette) cannot be displayed or printed with this utility.

(See the System Control Programming Reference/Operation Manual for more information about the user-defined IPL data set.)



## Select Status Option (37-01)

After the utility program is loaded, the next prompt is displayed:

```
SYSSTAT - SYSTEM STATUS UTILITY
What type of status do you want?
Options are
 1. System
 2. IPL diskette
Select option: Press ENTER 37-01
```

1. Enter the option to be used.
2. Press the Enter key.

If you select option 1, the system status prompt (37-10) is displayed. If you select option 2, the insert IPL diskette prompt (37-02) is displayed.

## SYSTEM STATUS

### Display Status Information (37-10)

If you select the system status option 37-01, information similar to the following is displayed:

| Partition | Job name | Type  | Size | Partition | Job name | Type  | Size |
|-----------|----------|-------|------|-----------|----------|-------|------|
| 0         | SYSSTAT1 | FN    | 12   | 4         | SYSSTAT2 | BN/00 | 27   |
| 1         | PROCINIT | FC    | 09   | 5         | SYSCTL04 | BN/01 | 31   |
| 2         | SYSPRINT | FN    | 21   | *         | *****    | ***** | **   |
| 3         | SNAPSHOT | BN/00 | 16   | *         | *****    | ***** | **   |

Press ENTER 37-10

The partition numbers (0 through 7), the job name, the partition types, and the partition sizes (minimum of 6K and maximum of 64K) are displayed.

The partition type field is as follows:

XX/XX



Asterisks appear in the job name for a partition that is configured but not in use. Asterisks appear in the job name, partition number, partition type, and size fields for a partition that is not configured.

If you have configured the maximum disk allocation table, press the Enter key to display the maximum disk allocation table for the partition-entries prompt (31-21).

If you have not configured the maximum disk allocation table, press the Enter key to redisplay this prompt for an update of the current status information.

To terminate the system status update process, press the Cmd key, then the End-of-Job key. The utility-terminated prompt (37-79) is displayed.

## Display Maximum Disk Allocation, Partition Entries (37-21)

If you have configured the maximum disk allocation table, the following prompt is displayed:

```
01 Partition Disk Allocate Partition Disk Allocate
02 0 00000 4 01024
03 1 00256 5 01280
04 2 00512 6 01536
05 3 00768 * *****
06 Press ENTER to continue
```

37-21

The partition numbers and the maximum disk allocation for each partition are displayed. Unconfigured partitions are displayed with asterisks.

The disk allocate value is the number of K bytes of disk space which are allocated for each partition. This value is used when you specify allocate maximum on disk data sets while running in these partitions.

A 0 in this field means no value was entered in the maximum disk allocation table for the partition entry, and the system-shared maximum disk allocation value applies.

Press the Enter key to continue.

To terminate the system status update process, press the Cmd and then the End-of-Job key. The utility terminated prompt (37-79) is displayed.

## Display Maximum Disk Allocation, System-Shared Entries (37-22)

The maximum disk allocation value for the system-shared entries is displayed.

```
System Disk Allocate Value: XXXXX K bytes
```

```
Press ENTER
```

```
37-22
```

The disk allocate value is the number of K bytes of disk space configured for a system-shared entry. This value is used if the value for the partition in which the job is running is 0.

A 0 in this field means no value was entered in the maximum disk allocation for system-shared entries and may cause the rest of the disk to be allocated if the partition entry is also 0. See "The Maximum Disk Allocation Table" on page 9-3 for more information.

Press the Enter key to redisplay the display system status information prompt (37-10).

To terminate the system status update process, press the Cmd and then the End-of-Job key. The utility terminated prompt (37-79) is displayed.

## IPL DATA SET STATUS

### Insert the IPL Diskette (37-02)

If you select the IPL diskette option in prompt 37-01, the following prompt is displayed:

```
Insert IPL diskette and enter
```

```
Data set name: □| | | | | | |
```

```
Device address:
```

```
Press ENTER
```

```
37-02
```

1. If necessary, insert the IPL diskette into a diskette drive.
2. Enter the IPL data set name specified during system configuration.
3. Enter the device address.
4. Press the Enter key.

**Note:** The label list utility can be used to list the IPL data set name.

The system loads and opens the IPL data set. If a printer is attached to the system, the output device prompt (37-03) is displayed. If no printer is attached, the first display IPL diskette status prompt (37-06) is displayed.

## Which Output Device Will be Used? (37-03)

After the IPL data set is opened, the following prompt is displayed if a printer is attached to the system:

Which output device will be used?

Options are

1. Display
2. Printer

Select option:  Press ENTER

37-03

1. Enter a 1 to display the IPL data set status information, or enter a 2 to print the information.
2. Press the Enter key.

If you select option 1, the first display IPL diskette status prompt (37-06) is displayed. If you select option 2, the printer address prompt (37-04) is displayed.

## Print the IPL Data Set Information (37-04)

If you select the print option the following prompt is displayed:

```
Enter the following printer information.
Enter printer device address: L111
Total lines per page (1-255): 066
Printed lines per page (1-255): 055
```

Press ENTER

37-04

1. Enter the device address of the printer that will print the IPL data set status information.
2. Enter the total number of lines per page (blank and printed). The number you enter must be greater than or equal to 1 and less than or equal to the number of lines per page. A default value is pre-entered for you and appears on the display.
3. Enter the total number of printed lines per page. The number you enter must be greater than or equal to 1 and less than or equal to 255. A default value is pre-entered for you and appears on the display.
4. Press the Enter key.

The printing begins and the print in process prompt (37-05) is displayed.

## SYSSTAT in Process (37-05)

While the status information is being printed, the following message is displayed:

SYSSTAT in process.

37-05

The message remains displayed until the printing is completed. Then the utility-completed prompt (37-78) is displayed.

```

Data set name SYSIPL52
System size (K-bytes) 288
Common function size (K-bytes) 17
Common function name SYSHELP
Disk error log NO
Number of application microprocessors 1
ASCII YES
Date prompt YES
Number of diskette/disk drives 8
BSC Multipoint Monitor provision YES
BSC Multipoint Monitor installed YES

```

```

Printer Type Device address
1 5256 8000
2 5256 8001
3 5224 8002

```

```

Partition Type Size Disk Allocate
0 F 46 *****
1 F 32 *****
2 F 32 *****
3 F 32 *****
4 B 32 *****
5 B 32 *****
6 B 32 *****
7 B 31 *****

```

System Disk Allocate Value: \*\*\*\*\* K bytes

Default device addresses for loading partitions

```

Partition Device address
0 4800
1 5000
2 5400
3 5800

```

```

Keyboard Display type Language/Keyboard
0 5 002
1 4 002
2 4 002
3 5 002

```

```

Partition 0 entries
**/ **/ **/

```

```

Partition 1 entries
**/ **/ **/

```

```

Partition 2 entries
**/ **/ **/

```

```

Partition 3 entries
**/ **/ **/

```

```

Partition 4 entries
**/ **/ **/

```

```

Partition 5 entries
**/ **/ **/

```

```

Partition 6 entries
**/ **/ **/

```

```

Partition 7 entries
**/ **/ **/

```

```

System shared entries
D1/4000 D2/4400 D3/4800 D4/4C00 D5/5000 D6/5400 D7/5800
D8/5C00

```

Figure 10-1. IPL Data Set Status.

## Display the IPL Data Set Status Information (37-06 through 37-22)

If you display the IPL diskette status information, the following information is displayed:

```
Data set name SYSIPL98
System size (K-bytes) 064
Common function size (K-bytes) 07
Common function name SYSDPRT2 Disk error log YES
Number of application microprocessors 1
 Press ENTER 37-06
```

The data set name is the user-defined name for the IPL data set.

The system size is a number from 32K to 288K of storage bytes.

The common function size is approximately 6K for SYSDPRT2, common function option one; approximately 15K for SYSCFA, common function option two; approximately 16K for SYSHELP, common function option three; and approximately 22K for SYSJJCFA, common function option four. If the disk error log is supported, the common functions size is increased by 1K. (The disk error log permits the system error log to be automatically written to a disk data set.)

The common function name is the name of the common function data set: SYSDPRT2, SYSCFA, SYSHELP, or SYSJJCFA.

Press the Enter key to continue. The next IPL data set status information prompt (37-16) is displayed.

```
01 ASCII YES
02 Date prompt NO
03 Number of diskette/disk drives 6
04 BSC Multipoint Monitor provision YES
05 BSC Multipoint Monitor installed NO
06 Press ENTER
```

37-16

YES or NO is displayed in the ASCII field to denote whether or not the system can use ASCII diskettes.

The data prompt field shows YES or NO to indicate whether or not the date prompt is displayed following an IPL.

The number of diskette/disk drives shows the total number of diskette and disk drive devices provided for in the configuration.

YES or NO in the BSC multipoint monitor provision field indicates whether or not space was provided in the system configuration for an BSC multipoint monitor.

YES or NO in the BSC multipoint monitor installed field indicates whether or not the BSC multipoint monitor program has been installed.

Press Enter to continue. The printer information prompt (37-07) is displayed.

| Printer | Type    | Device address |
|---------|---------|----------------|
| 1       | 5256    | 8000           |
| 2       | 5242/XX | 8008           |
| 3       | 5217    | 8010           |
| *       | *****   | ****           |

| Printer | Type  | Device address |
|---------|-------|----------------|
| *       | ***** | ****           |
| *       | ***** | ****           |
| *       | ***** | ****           |
| *       | ***** | ****           |

Press ENTER

37-07

The printer numbers (1 through 8), machine number, and device addresses are displayed. Asterisks appear in the fields if a printer is not configured.

**Note:** Some IBM printer models display a language group designation, XX, after the printer type. See prompt 20-33 in the System Control Programming Reference/Operation Manual for the language group designation.

To advance to the next display, press the Enter key.

The partition information is displayed as follows:

| 01 | Partition | Type | Size | Disk Allocate | Partition | Type | Size | Disk Allocate |
|----|-----------|------|------|---------------|-----------|------|------|---------------|
| 02 | 0         | F    | 20   | 00100         | 4         | B    | 32   | 00140         |
| 03 | 1         | F    | 20   | 00110         | 5         | B    | 32   | 00150         |
| 04 | 2         | F    | 16   | 00120         | 6         | B    | 32   | 00160         |
| 05 | 3         | B    | 32   | 00130         | *         | *    | **   | *****         |
| 06 |           |      |      | Press ENTER   |           |      |      | 37-08         |

For each configured partition number, the type, size, and the disk allocate maximum values are displayed. Partition type is either F, for foreground, or B, for background.

The disk allocate value is the number of K bytes of disk space which are allocated for each partition. This value is used when you specify allocate maximum on disk data sets when running in those partitions.

A 0 in this field means no value was entered in the maximum disk allocation table for the partition entry and the system-shared maximum disk allocation value applies.

Asterisks are displayed in the fields if a partition or field is not configured. Press the Enter key to display the next prompt.

The maximum disk allocation value for the system-shared entries is displayed.

```
System Disk Allocate Value: XXXXX K bytes
```

```
Press ENTER
```

```
37-22
```

The disk allocate value is the number of K bytes of disk space configured for a system-shared entry.

Asterisks appear in the disk allocate value if the maximum disk allocation table is not configured.

A 0 in this field means no value was entered in the maximum disk allocation table for the system-shared entry and may cause the rest of the disk to be allocated, if the partition is also 0. See "The Maximum Disk Allocation Table" on page 9-3 for more information.

Press the Enter key to display the next prompt.

If two application microprocessors are specified in the configuration, the following information is displayed:

|                               |   |   |
|-------------------------------|---|---|
| Application microprocessor    | 1 | 2 |
| First partition given service | 0 | 0 |
| Last partition given service  | 3 | 1 |

Press ENTER

37-18

The first column shows the partition that is given service first by application microprocessor number 1, and the partition last given service. The second column gives the same type of information for application microprocessor number 2.

Press the Enter key to display the next prompt.

If any programs are to be loaded automatically following IPL, the following prompt is displayed:

| Programs to load at system IPL time |              |                        |
|-------------------------------------|--------------|------------------------|
| Partition                           | Program name | Loaded by FG partition |
| 0                                   | PROGRAM1     | 0                      |
| 1                                   | PROGRAM2     | 1                      |

Press ENTER

37-19

This prompt displays the names of the programs to be loaded into the partitions shown in the first column. The third column identifies the foreground partitions that are responsible for loading the corresponding partitions shown in the first column. This prompt will reappear each time the Enter key is pressed until all such program names have been displayed.

Press the Enter key to display the next prompt.

If default device addresses for the load prompts have been specified in the configuration, the following prompt is displayed:

Default device addresses for loading partitions

| Partition | Device address |
|-----------|----------------|
| 0         | 4000           |
| 1         | 4400           |

Press ENTER

37-20

This prompt displays the default device addresses given for each specified partition. If required, this prompt will reappear a second time to complete the list.

Press the Enter key to go to the next prompt.

The keyboard information is displayed as follows:

| Keyboard | Display Type | Language/Keyboard |
|----------|--------------|-------------------|
| 0        | 5            | 001               |
| *        | *            | ***               |
| *        | *            | ***               |
| *        | *            | ***               |

Press ENTER

37-09

The keyboards are numbered from 0 to 3. The display type is listed as a one-digit number from 1 through 5, and depends on the number of characters that can be displayed on the screen and the screen type, as follows:

| Display Type | Screen Size | Screen Type |
|--------------|-------------|-------------|
| 1            | 480         | Single      |
| 2            | 480         | Dual        |
| 3            | 960         | Single      |
| 4            | 960         | Dual        |
| 5            | 1920        | Single      |

The language/keyboard number (1 through 132, or 999 for an RPQ language) is also displayed. See "Appendix A. Language/Keyboard Chart" on page A-1 for an explanation of these numbers.

Press the Enter key to display the next prompt.

If an RPQ language has been specified, its data set name is displayed in the following prompt:

Language/Keyboard RPQ data set name

RPQ2

Press ENTER

37-17

Press Enter to display the next prompt.

If a resource allocation table has not been defined for the system, the following prompt is displayed:

NO RESOURCE ALLOCATION TABLE DEFINED.

Press ENTER to continue

37-15

If a resource allocation table has been defined for the system, the partition entries are displayed (37-11); if there are no partition entries, prompt 37-10 is displayed:

```
Partition 0 entries
XX / YYYY XX / YYYY XX / YYYY / / / /
 / / / / / / /
 / / / / / / /
 / / / / / / /
Press ENTER to continue 37-11
```

**Note:** Xs in this sample prompt represent the logical device address. Ys represent the physical device address. For more detail on device addresses in the resource allocation table, see "Chapter 9. The Resource Allocation Utility (SYSRAU)" on page 9-1.

```
Partition X entries
NO ENTRIES
Press ENTER to continue 37-13
```

After the partition entries, the system-shared entries are displayed (37-12); if there are no system-shared entries, prompt 37-14 is displayed.

```

System shared entries
XX / YYYY XX / YYYY / / / / /
 / / / / / / /
 / / / / / / /
 / / / / / / /
Press ENTER to continue
37-12

```

**Note:** Xs in this sample prompt represent the logical device address, Ys represent the physical device address.

```

System shared entries
NO ENTRIES
Press ENTER to continue
37-14

```

After all resource allocation table entries have been displayed, the utility-completed prompt (37-78) is displayed.

**Utility Completed (37-78)**

Upon completion of the display process, the utility-completed prompt (37-78) is displayed, allowing you to exit from the utility or restart the utility. If you restart the utility, the IPL diskette option prompt (37-02) is redisplayed. If you want to display the original status option prompt (37-01), you must exit the utility, then reload the SYSSTAT utility.

## CHAPTER 11. THE COMPRESS UTILITY (SYSCOMP)

The compress utility places all unused sectors that exist between data sets into one contiguous area. To do this, the utility rewrites all the undeleted data sets as close to the beginning of the diskette or disk as possible. The first data set that has unused space in front of it is rewritten starting at the beginning of this unused space. The next data set is rewritten starting at the end of the first data set that was rewritten. This process continues until all undeleted data sets are moved as close as possible to the beginning of the diskette or disk. The unused space that previously was between data sets is now at the end of the last data set, and can now be used for storing additional data sets.

Though the data sets are rewritten, their sizes do not change and remain as previously allocated. Although deleted data sets are removed, deleted and blank records within a data set are copied without changes.

Each data set header label is reassigned as close as possible to the beginning of the label area. Any unused space that exists between the labels is eliminated. The utility sorts the labels into the same order in which the corresponding data sets are arranged, then rewrites them in the label area.

If an I/O error occurs while the compress utility is moving labels or data, the utility attempts to restore the diskette or disk to a usable state before displaying the utility-terminated prompt (23-79). If the attempt to restore the diskette or disk fails, an informational message is displayed to let you know that the diskette or disk might be unusable.



## Suitable Backup Should Exist Before Compressing (23-01)

After the IBM 5280 system loads the utility into the storage area, the following prompt is displayed:

```
SYSCOMP - COMPRESS UTILITY
SUITABLE BACKUP SHOULD EXIST for the diskette before going on.
To stop now, press EOJ.
Otherwise, continue.
```

Press ENTER

23-01

If you do not have a backup copy for the data to be compressed, you can terminate the utility and make the backup copy before proceeding. Or you can load the copy utility into another partition and make the copy. An image copy is usually the fastest way to create a backup copy of the diskette. Use volume copy to create a backup copy of the disk.

If you want to terminate the utility and make the copy, press the Cmd key and then press the End-of-Job key to end the program. After you have made a copy of the data, reload the compress utility from the load prompt (05-00).

If you use another partition to make the copy rather than terminating and reloading the compress utility, continue with the compress program from the backup copy prompt (23-01) when the copy is completed.

Press the Enter key to continue the compress. The insert diskette prompt (23-02) is displayed.

## Insert Diskette to Be Compressed (23-02)

```
Insert diskette to be compressed and enter
Device address: □| | |
```

Press ENTER

23-02

1. If necessary, insert the diskette to be compressed.
2. Enter the device address.
3. Press the Enter key.

If the diskette is volume-protected, the volume-protected prompt (05-01) is displayed. Enter the owner ID, and press the Enter key to continue.

The compress begins, and the compress in process prompt (23-04) is displayed.

## Data Compression in Process (23-04).

After you gain access to the diskette or disk, the following message is displayed:

```
SYSCOMP in process.
```

23-04

The data set labels are sorted into the same order as the data sets on the diskette or disk and are rewritten starting at the beginning of the label area. Then the utility moves each data set to its new location. As each data set is moved, the utility modifies its label to reflect the new location.

**Warning:** The diskette locking door should not be opened while the compress utility is running or data may be lost.

When the compress process is completed, the utility-completed prompt (23-78) is displayed.

## Termination in Process (23-05)

If you use the Cmd, End-of-Job key sequence while compress is running, the following prompt is displayed:

```
SYSCOMP termination in process.
```

23-05

**Note:** The above prompt might be displayed very briefly and not be seen before the utility-terminated prompt (23-79) is displayed. In other cases it might remain displayed for a considerable length of time while the utility continues to a point in the compress process where it can terminate without a loss of data.

If a terminating error has occurred, or after you have pressed the End of Job key, after the termination in process prompt has been displayed the utility-terminated prompt (23-79) is displayed.

## Diskette May Be Unusable (23-10)

If an error occurs during label compression or sorting, an attempt is made to restore the data set label area to a usable condition, even though the process of rearranging labels might be incomplete. In a similar manner, if an error occurs during data set compression, the compress utility attempts to restore the data set being moved to a usable condition. If the restoration attempt fails, the following message is displayed before the utility-terminated prompt (23-79) is displayed:

```
SYSCOMP terminated.
One or more UNRECOVERABLE ERRORS have occurred.
Diskette may be unusable in its present condition.
```

Press ENTER

23-10

If this message is displayed, the error that caused the program to terminate has also affected the data on the diskette or disk. One or more data set header labels may have been lost due to an unrecoverable error, or a data set may have been partially overlaid during the compression process. The label list and copy utilities should be used to recover those data sets that are still accessible.

To advance to the utility-terminated prompt (23-79) from the above message, press the Enter key.

## Utility Completed (23-78)

If the compression has successfully completed, the utility-completed prompt (23-78) is displayed allowing you to exit from the utility or restart the utility. If you restart the utility to compress a different diskette or disk, the backup copy prompt (23-01) is redisplayed.

## Hints

- Since the compress utility operates upon the input diskette or disk, read or write errors or other interruptions of the compress process can result in an unusable diskette or disk. You should always have some form of backup for the diskette or disk that is to be compressed.
- The End-of-Job key is always active while labels and data sets are being compressed. However, if you use the Cmd, End-of-Job key sequence while an area on the diskette or disk is being compressed, the utility displays a termination in process prompt (23-05) and continues to compress the data until the current area being compressed is completed. When this process is completed, the utility-terminated prompt (23-79) is displayed. At this point, the diskette or disk is usable but might still have unused space between data sets or labels.
- If you use the Cmd, End-of-Job key sequence when an error condition is being displayed, the utility terminates and the diskette or disk might be unusable.

## Restrictions

- Because the compress utility rearranges header labels, it is not advisable to use this utility to compress diskettes or disks for which the ordering or position of the header labels in the label area is critical. IPL data sets that are created using the system configuration program are an example of this and should not be compressed using this utility.
- Diskettes or disks with data sets that have overlapping extents should not be compressed, because this can result in a loss of data.

## CHAPTER 12. THE FORMAT CONVERSION AID UTILITY (SYS3740C)

The format conversion aid utility assists you in converting 3740 data entry format programs into DE/RPG formats. Each program is written as a character string and stored on a diskette or disk. This utility loads the programs from the diskette or disk and converts them into DE/RPG A and Z specifications. See the IBM 5280 DE/RPG Reference Manual, SC21-7787, for more information about A and Z specifications.

Numeric characters for backward chaining are converted only to numeric continuation characters.

Eighty-character formats coded for the IBM 3742 that have chaining information in positions 79 and 80 must be modified before they can be converted. The forward chaining information in position 80 must be put into position 128. In addition, the appropriate field continuation character must be inserted in positions 79 and 80, if necessary.

The following chart shows the maximum sector size for the input and output diskette or disk according to the partition size being used.

| Partition Size | Max. Sector Size of Input             | Max. Sector Size of Output |
|----------------|---------------------------------------|----------------------------|
| 9K             | 512 <sup>1</sup> or 256 <sup>2</sup>  | 256                        |
| 10K            | 1024 <sup>1</sup> or 256 <sup>2</sup> | 512                        |
| 11K            | 1024                                  | 1024                       |

The following are format conversion examples. Any columns shown without data are blank. The information entered in response to the DE/RPG job information prompt (29-02) is identified by a user indicator in the output data columns.

Input: IBM 3740 format programs:

```
Position: 1 10 20 128

```

Buffer:

```

1 N-----A.....E 3
2 *DATE*ACTIVITY
3 N----..R2---L--A...E 8
8 U.....-.....E 1
A I....R-----E
```

<sup>1</sup> If sector size divided by record length has a remainder of 0.

<sup>2</sup> If sector size divided by record length has a non-zero remainder.

O 0019 D 01 40

Enter the following for DE/RPG specifications.

DE/RPG job name: DERPGJOB Transaction data set name: TRANSJOB

Transaction data set record length: 128

Specify the data set for converted DE/RPG source on the next screen.

Press ENTER

29-09

Z Specifications

| Column: | 6        | 10 | 20 | 45 | 55               |
|---------|----------|----|----|----|------------------|
| ZJ      | DERPGJOB |    |    |    | TFILE (TRANSJOB) |
| Z       | 1        | F1 | IE | 3  |                  |
| Z       | 3        | F3 | IE | 8  |                  |
| Z       | 8        | F8 | IE | 1  |                  |
| Z       | AOFA     |    | E  |    |                  |

A Specifications

| Column: | 6 | 17 | 19       | 30    | 35 | 38 | 45                         |
|---------|---|----|----------|-------|----|----|----------------------------|
| A       |   | F  | TRANSJOB | 128   |    |    | DEVICE (DISK D1)           |
| A       |   | F  | CRT      | 128   |    |    | DEVICE (CRT) DSPIZ (6 80)  |
| A       |   | R  | F1       |       |    | I  |                            |
| A       |   |    |          | 00006 |    | N  |                            |
| A       |   |    |          |       |    |    | PMT ('DATE')               |
| A       |   |    |          | 00015 |    | A  |                            |
| A       |   |    |          |       |    |    | PMT ('ACTIVITY')           |
| A       |   | R  | F3       |       |    | I  |                            |
| A       |   |    |          | 00007 |    | C  |                            |
| A       |   |    |          |       |    |    | SHIFT (NNNNNAA)            |
| A       |   |    |          | 00005 |    | N  | CHECK (RZ BC) TADD (*TOT2) |
| A       |   |    |          | 00003 |    | N  | CHECK (AD M10)             |
| A       |   |    |          | 00004 |    | A  |                            |
| A       |   | R  | F8       |       |    | I  |                            |
| A       |   |    |          | 00015 |    | C  | CHECK (AD)                 |
| A       |   |    |          |       |    |    | SHIFT (AAAAAANAAANAAA)     |
| A       |   | R  | FA       |       |    | I  |                            |
| A       |   |    |          | 00005 |    | A  | CHECK (RB)                 |
| A       |   |    |          | 00006 |    | N  | CHECK (BC)                 |



## Informational Message (29-01)

After the utility is loaded, the following message is displayed:

```
0 0001 A 01 40
```

```
SYS3740C - FORMAT CONVERSION UTILITY
```

```
Specify the data set containing the 3740 formats on the next screen.
```

```
Press ENTER
```

```
29-01
```

Press the Enter key.

The data set open prompt (06-82) for the data set that contains the formats is displayed.



## LOADING PROGRAMS INTO THE SYSTEM

To load the format programs to be converted, do the following:

1. Display the record containing the format to be converted by using the Enter/Rec Adv key, or the Page Fwd key, or the Home key, or one of the search functions. See the Operator's Guide for information about how to use these keys.

**Note:** If desired, the format can now be modified on the screen before you load it into the system. The format will not be changed on your diskette or disk.

2. Press the Cmd key, then press and hold the Shift key and press the Load Format key, then enter the number you are assigning to the format. After the format is loaded, the screen is cleared. As with the 3740, a prompting format must be loaded as an even-numbered format and its associated record format must be loaded as the previous odd-numbered format.

**Note:** A format can be either a one or a two-character entry. If you enter a one-character format, it must be a number (1 through 9). If you enter a two-character format, the first character must be an alpha character (A through Z), and the second character must be a number (0 through 9). (On the data entry keyboard, you must press the Alpha key to enter an alpha character.)

3. To load more than one format, repeat steps 1 and 2.
4. After all of the formats are loaded, press the Cmd key, then press the End-of-Job key. The format data set is closed and the format loading process ends.

After you finish the format loading process (step 4), you are ready to begin converting formats. The specify DE/RPG job name prompt (29-02) is displayed.

## CONVERTING FORMATS

After you have loaded the format programs to be converted, you are now ready to generate the DE/RPG source records and data sets, perform the actual conversion, and write the source data set. To do this, respond to the following prompts.

### Specify the DE/RPG Job Information (29-02)

After you have loaded the formats, the following prompt is displayed:

```
0 0019 D 01 40
```

```
Enter the following for DE/RPG specifications.
```

```
DE/RPG job name: □□□□□□□□ Transaction data set name:
```

```
Transaction data set record length:
```

```
Specify the data set for converted DE/RPG source on the next screen.
```

```
Press ENTER
```

```
29-02
```

1. Enter the user-defined DE/RPG job name. This name will be placed in the name field of the DE/RPG job specification that is generated during the conversion.
2. Enter the user-defined name for the transaction data set. This name will be used for the TFILE name on the job specification that is generated. The name will also be used as the transaction data set name in the first A specification record.
3. Enter the record length for the transaction data set. The record length can range from 1 through 128 characters. This record length will be inserted in the first two A specifications. This length also determines how many positions of the loaded formats will be converted. For example, if 32 is specified, then only the first 32 positions of each format are converted. The forward chaining character in position 128 is always converted.
4. Press the Enter key.

The open source data set prompt (06-82) is displayed.



## Data Set Open Failed (06-83)

If the data set is not found, the following prompt is displayed:

```
0 0021 D 01 40 E
Data set XXXXXXXX not found on device XXXX
Options are
 1. Allocate
 2. Reenter
Select option: Press ENTER 06-83
```

1. Enter a 1 to allocate space for the data set or a 2 to retry the open.
2. Press the Enter key.

If you enter a 1 to allocate the data set, the allocate prompt (06-84) is displayed.

If you enter a 2 to retry the open, the data set open prompt (06-82) is redisplayed. At this time, you can enter a different data set name or device address, or insert a different diskette.

## Allocate Data Set Space (06-84)

If you enter a 2 (allocate) for the data set open failed prompt, the following prompt is displayed:

```
0 0001 A 26 XX E
Enter data for data set allocate
Data set name: XXXXXXXX
Device address: XXXX Owner ID:
Exchange type: I Number of records: 000000 Record length: 128
 Press ENTER 06-84
```

The display shows:

1. The data set name and device address entered for the data set open prompt (06-82)
2. The owner ID if specified in the volume-protected prompt (05-01). This field does not appear if you are allocating a disk data set. If you want a disk data set password-protected, use the label (SYSLABEL) utility.
3. The default exchange type (I exchange)
4. The default value for the number of records (000000)

**Note:** On diskette, if the default value is used for the number of records entry, all of the remaining space on the diskette will be allocated to this data set. If the default value is used for a disk, the actual space allocated depends on how you have configured the maximum disk allocation table. See "The Maximum Disk Allocation Table" on page 9-3.

Any of the fields can be changed to your specifications, or you can accept the default values.

If you want to change the exchange type, enter a blank (space) for a basic exchange data set or an H for an H exchange data set. (See "Exchange Types" on page 1-20 for more information about exchange types.)

If you want to specify the number of records to allocate, you can use one of the following methods to determine the (a) approximate, or (b) exact number of records your DE/RPG source data set will require.

(a) To estimate the approximate number of records, use the following equation:

$$23 + (4 * \text{number of buffers loaded}) + (3 * \text{total number of fields})$$

(b) To calculate the exact number of records, use the following chart:

| Description                               | Spec | Number of Records Required                                                                                                         |
|-------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------|
| Job Specification                         | Z    | 1                                                                                                                                  |
| Format Sepcification                      | Z    | 1 for each buffer loaded with a 3740 format                                                                                        |
| Data set statements                       | A    | 2                                                                                                                                  |
| Comment Lines                             | A    | 4 for each format or prompt buffer loaded                                                                                          |
| Record statement                          | A    | 1 for each buffer loaded with a 3740 format                                                                                        |
| Field statement                           | A    | 1 for each field                                                                                                                   |
| If a field totals field                   |      | Add 1                                                                                                                              |
| If a field totals readout and reset field |      | Add 1 if field length ≤ 15,<br>Add 2 if field length is 16-77,<br>Add 3 if field length is 78-113,<br>Add 4 if field length > 113, |
| If a picture field                        |      | Add 1 if field length ≤ 29,<br>Add 1 for each additional 35 positions                                                              |
| If there is a prompt for this field       |      | Add 1 if the prompt length is ≤ 31<br>Add 1 for each additional 35 positions                                                       |

You might want to allocate more records than you presently need for the converted formats so you can add new DE/RPG source statements (to enhance the function of the converted program).

When the entries meet your requirements, press the Enter key. The data set is allocated and opened, and the utility in process prompt (29-03) is displayed.

## Utility in Process (29-03)

When the source data set is opened, the following prompt is displayed:

```
SYS3740C in process.
```

29-03

The preceding prompt is informational only. It lets you know that the actual conversion is taking place. When the conversion is successfully completed, the utility-completed prompt (29-78) is displayed.

**Note:** The format conversion aid utility does not audit for conflicting parameters within a program therefore, any such conflicts may also exist on the generated DE/RPG source. For example, a right-adjust field with a mixture of alphabetic and numeric continuation characters will generate a right-adjust keyword and shift keyword. A chain to a buffer that does not contain a program will generate a chain to an undefined record. The DE/RPG compiler will detect and report such errors.

If an unrecoverable error occurs during the conversion, or if you terminate the utility before normal completion by using the Cmd, End-of-Job key sequence, the utility terminates and the utility-terminated prompt is displayed.

If the format data set is open when you press the End-of-Job key, the specify DE/RPG job name prompt (29-02) might be redisplayed. If this happens, press the Cmd key and the End-of-Job key again to display the utility-terminated prompt.

Respond to the utility-terminated prompt to either exit from the utility or restart the utility. If you restart the utility, the retain/clear prompt (29-04) is displayed.

## Utility Completed (29-78)

When the utility is successfully completed, the utility-completed prompt (29-78) is displayed allowing you to exit from the utility or restart the utility. If you restart the utility, the retain/clear prompt (29-04) is displayed.

## Retain/Clear Formats (29-04)

If you restart the utility after completion or termination, the following prompt is displayed:

```
O 0001 D 01 40
Select initial formats for next conversion.
Options are
 1. Same formats as previous conversion 2. All formats cleared
Specify the data set containing the 3740 formats on the next screen.
Select option: Press ENTER 29-04
```

1. Select an option.
2. Press the Enter key.

Option 1 allows you to retain the previously loaded formats. If you wish to modify these formats, see "Modifying a Previously Loaded Format Before Conversion" on page 12-14.

If Option 2 is selected, all formats previously loaded are cleared from storage. Other formats must be loaded for the next conversion. See "Loading Programs Into The System" on page 12-6.

**Note:** Any formats that are not cleared from storage will be included in the next DE/RPG source data set that is generated. (Cleared formats have hex 00 in the first position.)

After you respond to the preceding prompt, the data set open prompt (06-82) is displayed and the conversion procedure continues.

## MODIFYING A PREVIOUSLY LOADED FORMAT BEFORE CONVERSION

If desired, you can modify a previously loaded format before it is converted.

To change a format, open the format data set and do the following:

1. Press the Cmd key, hold down the Shift key, then press the Change Format key followed by the format number (1 through 9 and A). (On the data entry keyboard, you must press the Alpha key to enter the character A.) The specified format is then displayed on the screen.
2. Make the changes to the format.
3. To load the changed format back into the system, press the Cmd key, hold down the shift key, then press the Load Format key followed by the number of the format to be loaded. The format is loaded, and the screen is cleared.

**Note:** The changed format is not written back to the format data set on the diskette or disk.

4. To redisplay the current record in the format data set, press the Cmd key, hold down the Shift key, then press the Display Data Key.

The modified format is now ready to be converted.

## CHAPTER 13. THE SCS/BSC IBM 3741 PRINT UTILITY (SYSCPRNT)

The SYSCPRNT utility allows you to print SCS data sets and data sets that contain IBM 3741 printer control characters. SYSCPRNT converts the IBM 3741 BSC printer control characters into the subset of standard character string (SCS) controls used by the IBM 5280 system printers.

SYSCPRNT provides three print functions:

- Print a single SCS data set
- Print a group of SCS data sets having a common group and forms type identifier in the data set names
- Print the output of the SYSBDCU SCS bypass option.

Other features of SYSCPRNT include:

- Printer format information for SCS processing of IBM 3741 BSC print data can be supplied from the keyboard or from a printer format record on diskette or disk.
- The first line of output can be printed multiple times for printer forms alignment purposes.
- For multi-volume input, the operator can insert up to eight volumes initially, exchange diskettes, or assign a different drive when the end of data is reached on a continued volume.
- Recovery from a data set open failure is possible when printing a group of data sets. The operator is given the option of retrying the open, continuing with the next data set in the group, or ending the print job.
- Page restart allows an operator to interrupt printing an SCS data set and restart from any page. (This feature is not provided with IBM 3741 BSC data sets.)

**Note:** Due to differences in the design of the IBM 3741 and the IBM 5280, certain carriage control characters are interpreted differently. You should exercise care when you use IBM 3741 control characters, as it may result in the crossing of page boundaries.

## IBM 3741 BSC PROTOCOL DATA STREAMS

SYSCPRNT accepts, as input, data sets that are created by the BSC Data Communications Utility (SYSBDCU) SCS bypass option. The following considerations apply:

- The input data set logical record length is less than or equal to 516.
- The physical records within the data set may be separated by intermediate record separators (IRS) and will not be greater than 516.
- If the data stream does not contain IRS characters, the data will be processed as a record equal to the data set logical record length.
- A physical record may contain an invalid escape sequence indicating a forms mount message. SYSCPRNT assumes that a invalid escape sequence is never split by an IRS character and that the record containing the invalid escape sequence does not contain print data.

The SYSBDCU SCS bypass option allows you to create data sets that cannot be processed by SYSCPRNT. If the input data set conforms to the considerations as listed above and if it will print on an IBM 3741, then SYSCPRNT will process and print the data set.

See the IBM 5280 Data Communication Reference Manual, SC34-0247 for more information.

## DATA TYPE DETERMINATION

Input data sets must be written in EBCDIC. ASCII data is not permitted because not all printer control characters can be translated from EBCDIC to ASCII.

Two types of data are valid input for this program. They are data sets containing IBM 5280 SCS printer control characters and IBM 3741 BSC protocol data sets. SYSCPRNT determines the type of input by inspecting the first record of the data set. If the first record contains SCS control character X'2B' or X'34', the program assumes it is IBM 5280 SCS. Otherwise, the program assumes IBM 3741 BSC protocol. SYSCPRNT prints either type of data set.

## IBM 3741 ESCAPE SEQUENCES

Valid escape sequences are as follows:

|              |   |        |                    |
|--------------|---|--------|--------------------|
| Escape (ESC) | A | '27C1' | Skip to channel 1  |
| Escape (ESC) | B | '27C2' | Skip to channel 2  |
| Escape (ESC) | C | '27C3' | Skip to channel 3  |
| Escape (ESC) | D | '27C4' | Skip to channel 4  |
| Escape (ESC) | E | '27C5' | Skip to channel 5  |
| Escape (ESC) | F | '27C6' | Skip to channel 6  |
| Escape (ESC) | G | '27C7' | Skip to channel 7  |
| Escape (ESC) | H | '27C8' | Skip to channel 8  |
| Escape (ESC) | I | '27C9' | Skip to channel 9  |
| Escape (ESC) | J | '27D1' | Skip to channel 10 |
| Escape (ESC) | K | '27D2' | Skip to channel 11 |
| Escape (ESC) | L | '27D3' | Skip to channel 12 |
| Escape (ESC) | M | '27D4' | Suppress space     |
| Escape (ESC) | / | '27E1' | Space 1 lines      |
| Escape (ESC) | S | '27E2' | Space 2 lines      |
| Escape (ESC) | T | '27E3' | Space 3 lines      |
| Escape (ESC) | U | '27E4' | Space 4 lines      |
| Escape (ESC) | V | '27E5' | Space 5 lines      |
| Escape (ESC) | W | '27E6' | Space 6 lines      |
| Escape (ESC) | X | '27E7' | Space 7 lines      |
| Escape (ESC) | Y | '27E8' | Space 8 lines      |
| Escape (ESC) | Z | '27E9' | Space 9 lines      |

**Note:** Escape sequences of X'27D1', X'27D2', X'27D3', and X'27D4' are invalid for IBM 3741 protocol. SYSCPRNT does not treat them as invalid escape sequences. Unexpected results, however, may occur if they are present in the data.

## OPERATION OF THE SCS/BSC 3741 PRINT UTILITY

### Load the SCS/BSC IBM 3741 Print Utility (05-00)

To load the utility, respond to the following prompt:

```
0 0001 A 16 40
```

```
Program name: □| | | | | | | | | | | | | | | |
```

```
Device address:
```

```
Partition number:
```

```
Press ENTER
```

```
05-00
```

1. If necessary, insert the diskette containing the utility into a diskette drive.
2. Enter SYSCPRNT as the name of the program to be executed.
3. Enter the device address.
4. Enter the number of the partition where the utility will be loaded. (If a partition number is not entered, the number defaults to the number of the partition associated with the keyboard at which you are working.)
5. Press the Enter key.

The utility is loaded, and the specify entry method prompt (39-01) is displayed.

## Specify the Entry Method (39-01)

After the utility is loaded, the following entry method prompt is displayed:

```
SYSCPRNT - SCS/BSC(3741) PRINT UTILITY
Select parameter entry method.
Options are
 1. Keyboard entry 3. Keyboard entry and create command data set
 2. Command data set
Select option: Press ENTER 39-01
```

Select an entry method option:

- Enter 1 if you are entering job parameters at the keyboard. The specify the print option (39-02) is displayed.
- Enter 2 if job parameters are to be read into the system from a command data set that already exists. The command data set prompt (39-17) is displayed.
- Enter a 3 if you are entering job parameters at the keyboard and also creating a command data set. The command data set prompt (39-17) is displayed.

## Command Data Set (39-17)

When you indicate that you are creating or using an existing command data set, the following prompt is displayed:

```
Insert command data set diskette and enter
Data set name: □□□□□□□□
Device address:
```

Press ENTER

39-17

If necessary, insert the diskette to be used and enter the command data set name. Then enter the device address. If you are creating the command data set, SYSCPRNT allocates the data set. Command data sets are allocated as I exchange, with a record length of 256, and the number of records equals 2.

If the command data set is being created, the print options prompt (39-02) is displayed when Enter is pressed.

If the command data set already exists, prompt (39-18) is displayed when Enter is pressed.

## Command Data Set Information (39-18 and 39-19)

When you use an existing command data set, the parameters for this prompt are read from the command data set. The input data set name, device address, and the printer address are displayed on the following prompt:

```
Insert input diskette.
Data set name: XXXXXXXX
Device address: XXXX
Make printer ready.
Device address: XXXX
 Press ENTER
```

39-18

If the command data set contains logical device addresses, SYSCPRNT will search the resource allocation table for the physical address and will display it if found.

After the prompt is displayed, you can remove the command data set diskette.

If necessary, insert the diskette for the input data set. If the print option was: "2. Print a group of data sets that have a common forms identifier", then the data set name displayed is the name that was specified for the first data set in the group.

Ready the printer, if necessary.

To continue, press Enter.

If the parameters read from the command data set specify the name of a data set containing printer format information, then the data set name, device address, and format name are displayed on the following prompt:

```
Insert diskette containing printer format information.
Data set name: XXXXXXXX
Device address: XXXX
Format name: XXXXXXXX
 Press ENTER
```

39-19

If necessary, insert the diskette containing printer format information.

The command data set contains the printer format record constructed by SYSCPRNT when the command data set was created if:

- The name of a data set containing printer format information is not contained in the command data set and
- The input data set is IBM 3741 protocol.

To continue, press Enter. The SYSCPRNT in process prompt (39-77) is displayed.

## Specify the Print Option (39-02)

When you choose to enter parameters from the keyboard or to create a command data set, the following prompt is displayed to allow you to select a print option:

```
Which print option do you want?
Options are
 1. Print one data set
 2. Print a group of data sets that have a common forms identifier
Select option: Press ENTER
```

39-02

Select a print option:

- Enter 1 if you are printing a single data set. The specify one input data set prompt (39-03) is displayed.
- Enter 2 if you are printing a group of SCS data sets on one type of printer forms. The specify input group prompt (39-05) is displayed.

To continue, press Enter.

## Specify One Input Data Set (39-03)

After you specify a print option, the following prompt is displayed to allow you to identify the input data set:

```
Insert diskette to be printed from and enter
Data set name: □□□□□□□□
Device address:
```

Press ENTER

39-03

Enter the data set name and the device address of the data set you want to print. If the data set is multivolume, you can enter up to eight device addresses. The device address of any two consecutive volumes must be unique.

If you are printing from a diskette, be sure the diskette to be printed from is in the proper diskette drive.

To continue, press Enter. The specify printer prompt (39-06) is displayed.

## Specify Input Group (39-05)

You can print a group of SCS data sets with names in the form "PRINT001" or "A001FORM", where "A" represents the group identifier, "001" represents the sequence numbers, and "FORM" represents the printer forms identifier.

After specifying a print option, the following prompt is displayed to allow you to identify your input data sets:

```
Insert diskette to be printed from and enter
Group identifier: □□□□□□□□
Sequence number of first data set in group: 001
Sequence number of last data set in group: 999
Printer forms identifier: Device address:
Press ENTER 39-05
```

Enter the group identifier. The group identifier is the first part of the input data set name. It can be a single alphabetic character or the characters PRINT.

Enter the sequence number of the first data set in the group. A value of "001" is pre-entered for you. Your entry must be numeric and must be greater than or equal to "001" and less than or equal to "999".

Enter the sequence number of the last data set in the group. A value of "999" is pre-entered for you. Your entry must be greater than or equal to the sequence number of the first data set in the group and less than or equal to "999".

Enter the printer forms identifier. Your entry may be up to 4 alpha-numeric characters. Blanks are allowed. If the characters PRINT were specified as the group identifier, this field must be left blank.

Enter the device address of the diskette or disk to be printed from. If diskette, be sure it is inserted in the proper drive.

SYSCPRNT will attempt to open and print each data set in the group you specify. If a data set fails to open, the data set open failure prompt (39-15) is displayed, and you are given the option of retrying, continuing with the next data set, or ending the print job.

See the IBM 5280 Communications Reference Manual, SC34-0247 for more information regarding naming conventions.

### Specify Printer (39-06)

To allow you to specify the printer device address, the following prompt is displayed:

```
Make printer ready.
Enter printer device address: Ulll
```

Press ENTER

39-06

Position the paper where you want the first line of output to be printed. Make sure the printer is ready.

Enter the device address of the printer.

To continue, press Enter. The printer forms alignment option prompt (39-07) is displayed.

## Printer Forms Alignment (39-07)

After you specify the printer device address, the following prompt is displayed:

```
Do you want to inspect printer forms alignment after
the first line is printed?
Options are
 1. Yes 2. No
Select option: Press ENTER
```

39-07

Select a printer forms alignment option:

Enter 1 if you want the program to halt after printing the first line to allow you to adjust the forms and reprint the first line. The inspect printer forms alignment prompt (39-13) is displayed.

If the input data set is IBM 5280 SCS and you are creating a command data set, the performing print prompt (39-20) is displayed.

If the input data set is IBM 5280 SCS and you are not creating a command data set, the SYSCPRNT in process prompt (39-77) is displayed.

If the input data set is IBM 3741 BSC protocol, the printer format information prompt (39-08) is displayed.

## Printer Format Information (39-08)

If the input data set is IBM 3741 BSC protocol, the following prompt is displayed:

```
Insert diskette containing printer format information and enter
Data set name: □| | | | | | | |
Device address:
Format name:
or press ENTER to continue and enter information from keyboard.
 Press ENTER
```

39-08

If you want to use an existing printer format record, insert the diskette (if necessary) containing the printer format information and enter the data set name, device address, and format name.

If you want to enter printer format information from the keyboard, leave all three fields blank and press Enter. The specify page margins prompt (39-09) is displayed.

If you use an existing printer format record and you are creating a command data set, the performing print prompt (39-20) is displayed.

If you use an existing printer format record and you are not creating a command data set, the SYSCPRNT in process prompt (39-77) is displayed.

All three fields must be entered, or all three must be blank, or an error is displayed.

If the data set open fails, or the format specified is not found or if it contains invalid information, an error is displayed and prompt 39-08 is redisplayed. If the format record contains invalid information, and if you blank all three fields on prompt 39-08 and press Enter, prompts 39-09, 39-10, 39-11 and 39-12 are displayed with the information from the format record in place of the defaults normally displayed.

The printer format record is described later in this chapter.

## Specify Page Margins (39-09)

If you choose to enter printer format information from the keyboard, the following prompt is displayed:

```
Specify page margins.
Number of lines per page (1-255): 066
Line number of top margin (1-255): 001
Line number of bottom margin (1-255): 066
Press ENTER
```

39-09

Enter the number of lines per page. The number you enter must be greater than or equal to 1 and less than or equal to 255. A default value is pre-entered for you and appears on the display.

Enter the line number of the top margin. The number you enter must be greater than or equal to 1 and less than or equal to the number of lines per page. A default value is pre-entered for you and appears on the display.

Enter the line number of the bottom margin. The number you enter must be greater than or equal to the line number of the top margin and less than or equal to the number of lines per page. A default value is pre-entered for you.

To return to prompt 39-08, press the Cncl key.

To continue, press Enter. The specify vertical tabs prompt (39-10) is displayed.

## Specify Vertical Tabs (39-10)

After you specify page margins, the following prompt is displayed:

```
Specify line numbers for vertical tabs or channels.
```

```
TAB/CHANNEL 1 2 3 4 5 6 7 8 9 10 11 12
Line number: 001
```

```
Press ENTER
```

```
39-10
```

Enter the line number corresponding to each channel number embedded in the data. The line number for channel 1 is the line number you specified for the top margin. You may enter line numbers for channels 2-12. The line numbers you specify must be in ascending order and between the line numbers specified for the top and bottom margins. If you enter zeros or leave an entry blank, the printer skips to the next line when that channel is selected. Channels 10, 11, and 12 are not valid for IBM 3741 BSC protocol.

To return to prompt 39-08, press the Cncl key.

To continue, press Enter. The specify line margins prompt (39-11) is displayed.

## Specify Line Margins (39-11)

After you specify vertical tabs, the following prompt is displayed:

```
Specify line margins.
Print positions per line (1-132): 132
Print position of left margin (1-132): 001
Print position of right margin (1-132): 132
Press ENTER
```

39-11

Enter the number of print positions per line. The number you enter must be greater than or equal to 1 and less than or equal to 132. A default value is pre-entered for you and appears on the display.

Enter the print position of the left margin. The number you enter must be greater than or equal to 1 and less than or equal to the number of print positions per line. A default value is pre-entered for you and appears on the display.

Enter the print position of the right margin. The number you enter must be greater than or equal to the left margin and less than or equal to the number of print positions per line. A default value is pre-entered for you and appears on the display.

To return to prompt 39-08, press the Cncl key.

To continue, press Enter. The specify horizontal tabs prompt (39-12) is displayed.

**Note:** Blank lines or incorrect printing may occur if the number of print positions per line is not sufficient.

## Specify Horizontal Tabs (39-12)

After you specify line margins, the following prompt is displayed:

```
Specify horizontal tabs with a 'T' in corresponding print positions.
-----+-----1-----+-----2-----+-----3-----+-----4-----+-----5-----+-----6-----+-----7
-----+-----8-----+-----9-----+-----0-----+-----1-----+-----2-----+-----3--
```

Press ENTER

39-12

Each horizontal print position from 001-132 is shown. Enter a "T" below each print position where you want to set a horizontal tab. Set tabs only between print positions greater than the left margin and less than or equal to the right margin.

To return to prompt 39-08, press the Cncl key.

To continue, press Enter. If you are creating a command data set, the performing print prompt (39-20) is displayed. If you are not creating a command data set, the SYSCRNT in process prompt (39-77) is displayed.

## Performing Print (39-20)

After you create a command data set, the program is ready to begin printing. You must indicate whether or not you want to perform the print operation. The following prompt is displayed:

```
Command data set created.
Do you want to perform print?
Options are
1. Yes 2. No
Select option: Press ENTER
```

39-20

Select a print option:

- Enter 1 if printing is to be performed. The SYSCPRNT in process prompt (39-77) is displayed.
- Enter 2 if you want to create a command data set and not perform the print. The SYSCPRNT completed prompt (39-78) is displayed.

## SYSCPRNT in Process (39-77)

During processing, the following prompt is displayed:

```
SYSCPRNT in process.
XXXXXXXX
```

39-77

The name of the data set currently being printed is displayed on the second line of this prompt. If the data set is multivolume, the multivolume sequence number is also displayed.

During processing you may need to respond to prompts, depending on options you selected and characteristics of the input data.

If you indicated that you want to inspect printer forms alignment after the first line is printed, the inspect printer forms alignment prompt (39-13) is displayed.

If you are printing a single data set that is multivolume, or if you are printing a group of data sets and some are multivolume, the multivolume input prompt (38-16) may be displayed at the end of each continued volume.

If you are printing a group of data sets, the data set open failure prompt (39-15) is displayed when an error occurs while opening a data set.

If the input data is IBM 3741 BSC protocol, the invalid escape sequence prompt (39-14) is displayed when an invalid escape sequence is detected.

Prompt 39-77 is redisplayed after you have responded to any prompt that is displayed during printing.

When processing ends, the SYSCPRNT completed prompt (39-78) is displayed.

## Inspect Printer Forms Alignment (39-13)

If you indicated that you want to inspect printer forms alignment after the first line is printed, the following prompt is displayed after the first line is printed:

```
Inspect printer forms alignment.
Do you want first line printed again?
Options are
 1. Yes 2. No
Select option: Press ENTER
```

39-13

Inspect printer forms alignment and make adjustments if necessary.

Enter 1 if you want the first line printed again. Prompt 39-13 is redisplayed after the line is printed again.

Enter 2 when the forms are properly aligned and you want to continue with the second line. Be sure that line 1 has printed on the current form. It is not reprinted when you enter 2.

## Invalid Escape Sequence (39-14)

IBM 3741 BCS data streams can contain invalid escape sequences used to indicate an operator message.

When an invalid escape sequence is detected by this program, the program empties its print buffer so all data occurring prior to the data unit containing the invalid escape sequence is printed on the current form. It then displays the following prompt:

```
The following record contains an invalid escape sequence.
5 A 5555PURCHASE ORDERS FOLLOW. LOAD FORMS & PROGRAM. *-D ELIBERATE LOCK UP-*55
5
Options are
1. Continue with next record 2. Change printer format information
Select option: Press ENTER 39-14
```

Up to 128 bytes of the data containing the invalid escape sequence are displayed on the second and third lines of the prompt.

Enter 1 if you want to continue processing with the next record.

Enter 2 if you want to change the printer format information. The printer format information prompt (39-08) is displayed. After you have changed the printer format information, prompt 39-14 is redisplayed. Enter 1 to continue processing with the next record. If you indicated you wanted to inspect printer forms alignment after the first line is printed, the inspect printer forms alignment prompt (39-13) is displayed after the first line is printed on the new forms.

## Data Set Open Failure (39-15)

If you are printing a group of SCS data sets and an error occurs when the program attempts to open a data set in the group, the error is displayed. When you press RESET, the following prompt is displayed:

```
6 5800-3215- SYSCPRNT XXXXXXXX
The following data set could not be opened. XXXXXXXX
Options are
 1. Retry open 3. End of input
 2. Continue with next data set
Select option: Press ENTER
```

39-15

The error information is displayed on the first line. The data set name is displayed on the second line.

Enter 1 to retry the open.

Enter 2 to continue with the next data set.

Enter 3 to end this print job.

## Multivolume Input (39-16)

When the program completes processing a continued multivolume data set, it attempts to open the next volume. If a device address for the next volume was not specified on prompt 39-03, or if the next volume cannot be opened in the device specified, the following prompt is displayed:

```
End of volume, print input data set XXXXXXXX Volume XX.
Insert diskette for next volume in device: XXXX
or respecify device address.
```

Press ENTER

39-16

The data set name and the volume sequence number of the last volume processed are displayed on the first line of the prompt.

The device address specified for the next volume or the device address of the last volume processed is pre-entered in the device address field of the prompt. You may remove the processed volume, insert the next volume, and press Enter to continue or you may insert the next volume into another drive, specify its device address, and press Enter to continue.



The following function keys and command key sequences may be used to scan the data set:

- Record advance (Enter)            Display the next record or display the next part of a record.
- Record backspace (Home)        Display the previous record or display the previous part of a record.
- Search end of data                Display the last record in the data set.
- Search record number            The operator is prompted for the relative record number of the record to display.

```
6 0001 D 08 40
Enter number for search relative record: □□□□
```

Press ENTER

39-22

- Search content                    The operator is prompted for a character string to be searched for in the data set. The character string may be up to 78 characters and must be enclosed in quotes when entered on the prompt. To search forward beginning on the next record, press Enter. To search backward beginning with the previous record, press Home. The record containing the character string is displayed if found.

```
6 0001 A 80 40
Enter character string for search content:
```

Press ENTER or HOME

39-23

Search end of data, search record number, and search content are command key sequences.

The operator may press the Cncl key during any of these prompts (39-21, 39-22, 39-23) to return to the display screen (prompt 39-24). The last record that was displayed will be redisplayed.

When you identify the character string for the print restart, position the cursor under the first character to be printed and press the Print key. SYSCPRNT searches the data previous to the character specified for SCS controls. If SCS controls are not found, the following prompt is displayed:

```
The page position could not be determined.
Specify page position to resume printing.
Line number: □□□□
Horizontal print position:
 Press ENTER
```

39-21

Enter the line number and horizontal print position where the record is to resume printing. Then press the Enter key to start printing.

If a different record or starting character is desired, press the Cncl key and the data set can be scanned again.

## SYSCPRNT Completed (39-78)

When the process is complete, the following prompt is displayed:

```
6 SYSCPRNT
SYSCPRNT completed.
Options are
 1. Restart
 2. Exit
Select option: Press ENTER
```

39-78

Enter 1 to restart SYSCPRNT.

Enter 2 to exit.

## SYSCPRNT Terminated (39-79)

If an unrecoverable error occurs during program execution, the error is displayed and when you press RESET, the following prompt is displayed:

```
6 SYSCPRNT
SYSCPRNT terminated.
Options are
 1. Restart
 2. Exit
Select option: Press ENTER
```

39-79

Enter 1 to restart SYSCPRNT.

Enter 2 to exit.

## PRINTER FORMAT RECORD

A printer format record is 256 bytes long and has the following format:

| Positions | Field Length | Description                                                                             |
|-----------|--------------|-----------------------------------------------------------------------------------------|
| 1-8       | 8            | Printer Format Name                                                                     |
| 9-11      | 3            | Contains the Header 'PFR'                                                               |
| 12-14     | 3            | Maximum Number of Lines (up to 255) Per Page                                            |
| 15-17     | 3            | Line Number of Top Margin                                                               |
| 18-20     | 3            | Line Number of Bottom Margin                                                            |
| 21-23     | 3            | Number of Print Positions Per Line (1-132)                                              |
| 24-26     | 3            | Print Position of Left Margin                                                           |
| 27-29     | 3            | Print Position of Right Margin                                                          |
| 30-161    | 132          | Horizontal Tabs (132 Tabs)<br>Blank = No Tab<br>T = Tab in Corresponding Print Position |
| 162-197   | 36           | Vertical Tabs or Channels (12)<br>Blank or 0 = No Tab<br>XXX = Line Number Tab          |
| 198-256   | 59           | Reserved                                                                                |

**Note:** When the responses to prompts 39-09, 39-10, 39-11, and 39-12 are saved in a command data set, they are saved as a printer format record with the printer format name left blank.

You can create a printer format record by using DE/RPG or the SYSDCDU utility.



## CHAPTER 14. THE DATA SET DISPLAY UTILITY (SYSBROWS)

The data set display utility allows you to look at the contents of data sets. You can view either normal IBM 5280 data sets or data sets in the format of the log generated by the controller program. (See the Procedure Control Language Reference Manual for more information about the controller log.) The contents of the data sets you view can have sector sizes up to 1024 bytes and can have record lengths up to 4096 bytes.

**Note:** Data sets with record lengths larger than 1024 bytes require a 13K partition. (Also, if you have a large file, increasing the partition size enhances the utility's performance.)

You view the contents of a data set by moving through, or scrolling, the data set. You control the scrolling by entering commands that enable you to do the following:

- Scroll a specific number of lines or horizontal positions
- Scroll the maximum number of lines or columns
- Limit the starting and ending relative record numbers of the records you want to scroll
- Scroll a full page
- Scroll a half page
- Find a specific character string. You can also specify these parameters for character strings:
  - A starting column
  - An ending column
  - A test or comparison condition.

You use the function keys to enter commands from the command line and control the direction you want to scroll. The Help key displays a description of the available commands and their functions. You end this utility with the Cmd, End-of-Job key sequence.

The utility does not display page numbers, headings, or characters to indicate the end of record. The utility also does not display any records that contain the record delete character in the last record position.

If you are displaying the controller log, you can display entries to the log as they are entered.

**Note:** The Procedure Control Language supports the data set display utility (SYSBROWS) prompts. However, you must operate the display screen manually.



## Data Set Type (40-01)

When the utility is loaded the following prompt is displayed:

```
1 0001 D 01 40
SYSBROWS - DATA SET DISPLAY UTILITY
Is the data set a wrap data set ?
Options are
 1. Yes 2. No
Select option: Press ENTER
```

40-01

Select an option and press the Enter key.

The insert diskette to be scrolled prompt (40-02) is displayed.

Select option 1 only if you have a data set in the format of the log generated by the controller. (These data sets wrap to rewrite over the first record in the data set when the data set becomes full.) See Appendix A in the Procedure Control Language Reference Manual for a description of the controller log format.

Select option 2 for all normal IBM 5280 data sets.

## Insert Diskette to be Scrolled (40-02)

If you have specified the data set type, the following prompt is displayed:

```
0 0001 A 16 40
Insert diskette to be browsed and enter
Data set name: | | | | | | | |
Device address:
```

Press ENTER

40-02

1. Enter the name of the data set you want to display.
2. Enter the device address.
3. Press the Enter key.

If the diskette is volume-protected, or the disk data set is password-protected, prompt 05-01 is displayed. Enter the matching owner ID or password, and press the Enter key.

The data set is displayed. Normal IBM 5280 data sets start with the first record of the data set. The first record of a wrap data set is the oldest record. To view the newest record of a wrap data set, enter MAX in the CMD field and press the Enter key.

## The Help Screen (40-03)

If you have pressed the Help key, the following prompt is displayed:

```
3 0000 A 00 40 DIRECTRY 5000 POS: 0001-0080
<CMD> KEY + SHIFTS WINDOW <CMD> KEY + SHIFTS WINDOW

<CURSOR RIGHT> RIGHT <CURSOR UP> UP
<CURSOR LEFT> LEFT <CURSOR DOWN> DOWN

COMMAND ACTION
MAX LINES OR COLUMNS. DEFAULT VERTICALLY IS SCROLL
LIMIT FROM <TO> AMOUNT WHILE HORIZONTAL IS HALF RECORD LENGTH.
FIND STRING SHIFT WINDOW BY MAXIMUM AMOUNT.
NEXT SPECIFY LOGICAL RELATIVE RECORD NUMBERS TO
SCROLL NUMBER START AND END SCROLL FOR NON-WRAP DATA SETS.
HALF FIND STRING. ADDITIONAL PARAMETERS:
PAGE <FROM> - STARTING COLUMN NUMBER.
 <TO> - ENDING COLUMN NUMBER.
 <TEST> - EQ|NE|GE|GT|LT|LE.
 REPEAT PREVIOUS FIND COMMAND.
 SCROLL VERTICALLY BY NUMBER.
 SCROLL VERTICALLY HALF SCREEN.
 SCROLL VERTICALLY FULL SCREEN.
```

Press ENTER to continue

40-03

If you have a 480 or 960 character screen, continue to press Enter to display the rest of this prompt.

**Note:** To view previous screens, press Enter until the help screen is completed, then press the Help key again.

## Displaying the Data Set

The data set you have specified is displayed as follows:

Status Line (see The Data Set Display Utility Status Line in this chapter.)

```

O 0001 D 05 40 XXXXXXXX XXXX PGS: 0001-0080
CMD: [] SCROLL: HALF
AA BB
AA SCROLL Field CCCCCCCCCCCCCCCCCCCCCC
AA DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD
Command Line AAAAAAAAAAAAAAAAAAAAAAAAAAAA EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
AA FF

GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII JJJJJJJJJJJJJJJJJJJJJJJJJJJJJJJJJJJJJ
KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK LLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL
MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO PPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP
QQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQQ RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT

```

The first line is a status line. See "The Data Set Display Utility Status Line" on page 14-13 for an explanation of the status line fields.

The second line is a command line. The CMD and the SCROLL fields on this line control how you operate the data set. (You must enter commands in the CMD field in either all upper or all lower case. For example, enter MAX or max. Do not enter Max.)

The third line is the beginning of the data set you are displaying. (The number of lines displayed depends on the size of your display screen.)

## Scrolling Vertically

When you scroll the data set, think of the data set screen as a window to your data set. For example, if you are scrolling down, think of the window moving down the data set.

Down—To scroll down the data set (toward the end of the data set):

- Press the Enter/Rec Adv key, or press the Cmd key and then the ↓ (cursor down) key.

Up—To scroll up the data set (toward the beginning of the data set):

- Press the Home key, or press the Cmd key and then the ↑ (cursor up) key.

The window (display screen) moves the amount you specify in the CMD field as follows:

- XXXXX, where XXXXX is the number of lines you want to scroll.
- MAX to the top or the bottom of the data set.
- LIMIT XXXXX YYYYY, where XXXXX is the starting relative record number and YYYYY is the ending relative record number of the area you want to scroll. Press the Enter key. (This command is for non-wrap data sets only.) The limit command is in effect until you reset it. To reset an entire data set, enter LIMIT 1.

**Note:** An entry in the CMD field remains until the field is blanked or changed. You can blank the CMD field as follows: position the cursor in the first position of the CMD field and then press the Field Exit key on the data entry keyboard, or the Field+ (Field Plus) key on the typewriter keyboard.

If the CMD field is blank, the window will move the amount specified in the SCROLL field.

You can specify the amount you want in the SCROLL field as follows:

- HALF, moves 1/2 the number of available lines per screen. (HALF is displayed as a default.)
- PAGE, moves the full number of available lines per screen.
- XXXXX, where XXXXX is the number of lines you want to move.

## Scrolling Horizontally

You can scroll the window (display screen) horizontally as follows:

Right—To scroll the window to the right:

- Press the Cmd key and then the → (character advance) key.

Left—To scroll the window to the left:

- Press the Cmd key and then the ← (character backspace) key.

The window moves the number of horizontal positions you specify in the CMD field as follows:

- XXXXXX, where XXXXXX is the number of spaces or positions you want to move.
- MAX, the maximum amount left or right.

**Note:** An entry in the CMD field remains until the field is blanked or changed. You can blank the number in the CMD field as follows: position the cursor in the first position of the CMD field and then press the Field Exit key on the data entry keyboard, or the Field+ (Field Plus) key on the typewriter keyboard.

If no value is in the CMD field, the window moves one-half of the record length (or a maximum of 40 horizontal spaces).

The status line shows the horizontal position of the data set display. For example, if you are in the first horizontal position, the status line shows 0001-0080. If you move the window 40 spaces to the right, the status line shows 0041-0120. (The status line will not show a horizontal position larger than the record length.)

Each Cmd and cursor key sequence results in the window moving to the right or left within the data record, with the following exceptions:

- Cmd ← (character backspace) from the starting position of the record will cause an 8 digit relative record number to appear. Repeated Cmd ← (character backspace) key sequences will cause no further advancement.
- Cmd → (character advance) key sequence will not move the window beyond the last horizontal position of the record.

Data Set

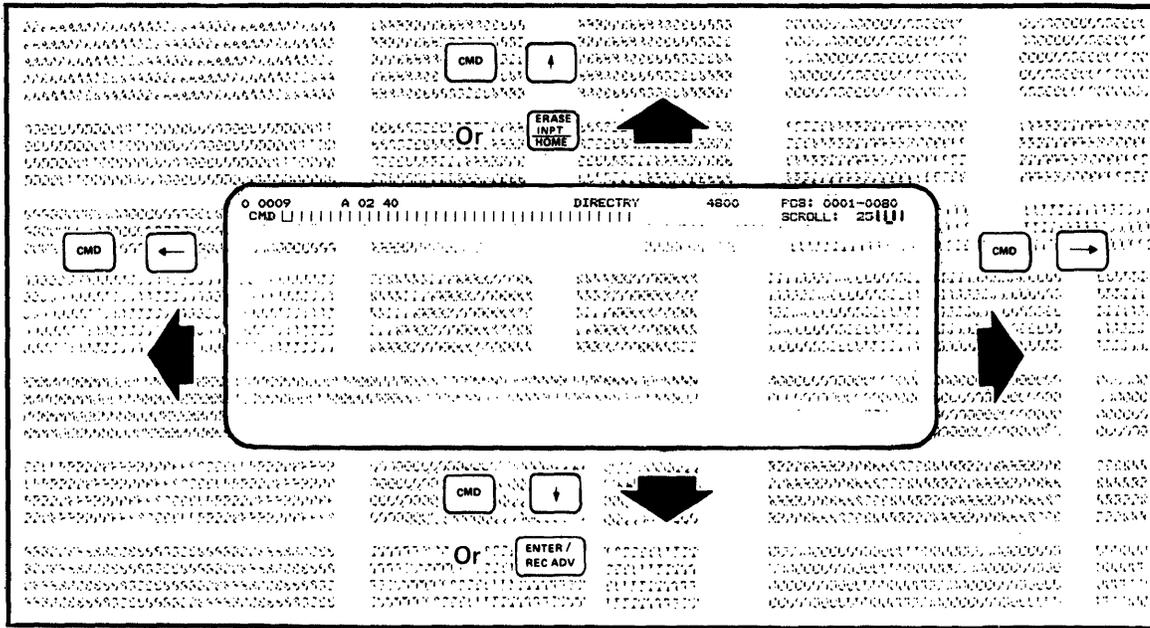


Figure 14-1. Scrolling Vertically and Horizontally

## Finding a Character String

You can use the FIND command to locate a specific character string in the data set. Also, you can limit the horizontal positions you want the utility to search and specify test conditions for the character string.

You enter the FIND command in the CMD field as follows:

```
CMD: FIND STRING FROM TO TEST
```

Where:

- STRING is the character(s) you want to find (maximum 16 alphameric characters)
- FROM is the starting horizontal position
- TO is the ending horizontal position
- TEST is the condition you want to test. Valid entries are:
  - EQ (equal)                      - LT (less than)
  - NE (not equal)                 - LE (less than or equal to)
  - GT (greater than)             - GE (greater than or equal to)

Press the Enter key. The display utility searches the data set for the character string you have entered and displays it as the first line of your data set.

Notes:

1. FIND, STRING, FROM, TO, and TEST must be separated by at least one blank. (STRING may not include imbedded blanks.)
2. FROM, TO, and TEST, are optional. However, they are sequentially dependant. For example, you may not enter a test condition unless you have also entered the starting and ending postitions.

The FIND command will remain in the CMD field until you enter another command or blank the field. See the note under "Scrolling Horizontally" on page 14-9.

If you want to return to a previous FIND command after you have changed or removed it, enter NEXT in the CMD field and press Enter.

The following are some examples of using the FIND commands:

### Horizontal Postion

|                        |                                                            |
|------------------------|------------------------------------------------------------|
| Relative Record Number | 11111111111222222222233333333334444444444555555555         |
|                        | 1234567890123456789012345678901234567890123456789012345678 |

|          | NAME    | EMP# | ITEM  | PRICE | DESC        |
|----------|---------|------|-------|-------|-------------|
| 00000001 | BROWN   | 0010 | 26434 | 52999 | 3PC BLUE    |
| 00000002 | JONES   | 0120 | 26986 | 2500  | SHIRT BROWN |
| 00000003 | SMITH   | 0026 | 26986 | 2500  | SHIRT GREEN |
| 00000004 | JOHNSON | 0034 | 26426 | 500   | SOCKS BLACK |
| 00000005 | BROWN   | 0010 | 26984 | 2700  | SHIRT BLUE  |
| 00000006 | JOHNSON | 0034 | 26426 | 38200 | 2PC BROWN   |

#### Command:

#### Result:

CMD: FIND BROWN

Repeated Enter commands will display BROWN on these relative record lines: 00000001, 00000002, 00000005, 00000006.

CMD: FIND BROWN 26

Repeated Enter commands will display BROWN on these relative record lines: 00000002, 00000006.

CMD: FIND BROWN 1 9

Repeated Enter commands will display BROWN on these relative record lines: 00000001, 00000005.

CMD: FIND 2500 24 30 GT

Repeated Enter commands will display the following numbers in the price column: 52999, 2700, 38200.

CMD: MAX

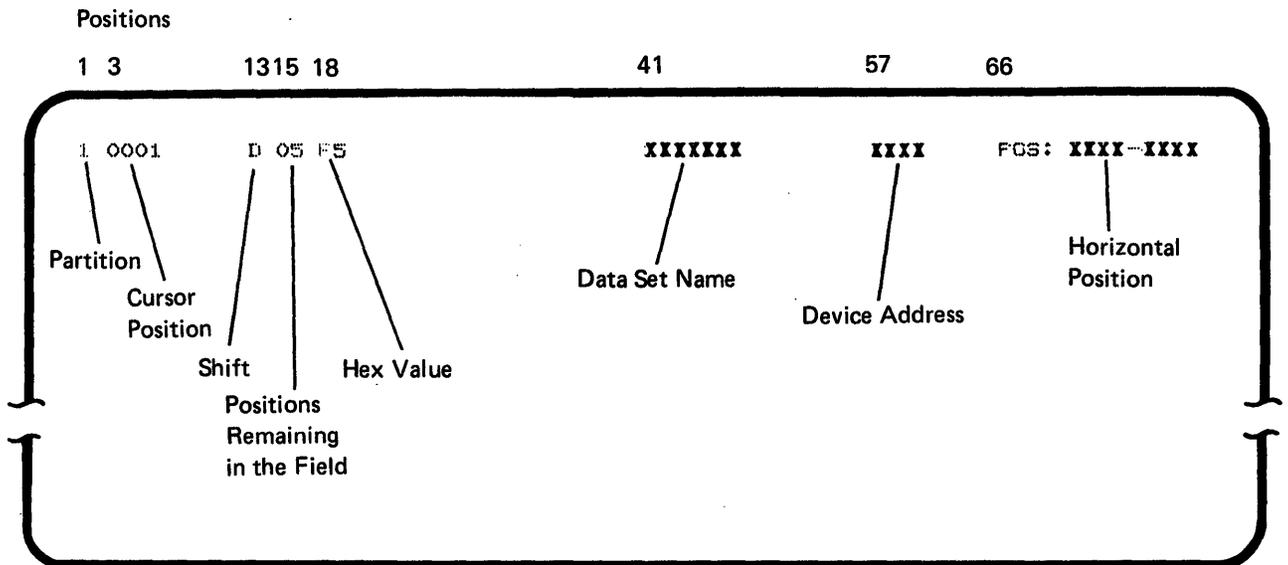
Scroll the maximum amount.

CMD: NEXT

Repeat the command to FIND 2500 24 30 GT.

The Data Set Display Utility Status Line

The status line for the data set display utility is as follows:



The following is a description of the contents of the status line:

| Position(s)  | Contents                                                                                                                                                                                                                                                                                                                                                          |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1            | Partition number                                                                                                                                                                                                                                                                                                                                                  |
| 2            | Blank                                                                                                                                                                                                                                                                                                                                                             |
| 3 through 6  | Cursor position from the beginning of the record.                                                                                                                                                                                                                                                                                                                 |
| 7 through 12 | Blank                                                                                                                                                                                                                                                                                                                                                             |
| 13           | Keyboard shift<br><ul style="list-style-type: none"> <li>A - alphabetic</li> <li>N - numeric</li> <li>D - digits only; displayed in prompts where option is selected.</li> </ul>                                                                                                                                                                                  |
| 14           | Blank                                                                                                                                                                                                                                                                                                                                                             |
| 15 and 16    | The number of positions remaining to be keyed in the field. This counter will increment or decrement, depending upon the cursor movement through the field. When the cursor is in the first position of the field, this counter represents the field length. When the cursor is in the last position of the field, this counter indicates one position remaining. |

| Position(s)   | Contents                                              |
|---------------|-------------------------------------------------------|
| 17            | Blank                                                 |
| 18 and 19     | The hexadecimal value of the current cursor position. |
| 20 through 40 | Blank                                                 |
| 41 through 48 | Data set name you are viewing                         |
| 49 through 56 | Blank                                                 |
| 57 through 60 | Device Address                                        |
| 66 through 79 | The horizontal position in the data set.              |

#### Data Set Display Utility Complete (40-78)

When you have ended the display utility with the Cmd, End-of-Job key sequence, the utility completed prompt (40-78) is displayed. You may exit from the utility or restart the display utility. If you restart the utility, the data set type prompt (40-01) is displayed.

#### Data Set Display Utility Terminated (40-79)

If the display utility is terminated before normal completion, the utility-terminated prompt (40-79) is displayed, allowing you to exit from the utility or restart the display utility. If you restart the utility, the data set type prompt (40-01) is displayed.

## CHAPTER 15. THE MENU UTILITY (SYSTEMENU)

The menu utility (SYSTEMENU) allows you to display and access the SYSMCR (menu configuration record) data sets to load programs or procedures. The SYSMCR data sets are created and stored by the menu configuration utility (SYSMCU). See "Chapter 16. The Menu Configuration Utility (SYSMCU)" on page 16-1.

The menu utility has four basic prompts. There is one prompt for each of the 3 menu levels and one prompt that allows you to change the level 1 menu. Each level prompt has options you can select to reach the next lower level of menu and an option 99 that you can select to return to the previous menu level. (Option 99 is generated by the menu utility.)

You can load a program or procedure by selecting the proper option number in each level as the prompts appear, or you can skip menu levels.

When you enter a level 3 option number, the menu utility searches for the associated level 3 data set name on the diskette or disk. If a match is found, the menu utility attempts to load the program into a partition. The program is loaded into the partition that you specified in the menu configuration utility (SYSMCU) prompt 42-34.

- If you entered a blank in the partition field, the menu utility loads the program into the partition in which you are currently running the menu utility.
- If you specified automatic loading (an asterisk in the partition field), the utility loads the program into the smallest available background partition in which the program fits.

If you also specified a partition size, the utility loads the program into the smallest background partition that is at least as large as the size you specified.

- If you specified a specific background partition, the menu utility attempts to load the program into that partition.
- If you specified a specific foreground partition, an error will occur, unless you are currently operating the menu utility in that partition.

**Note:** If the program is loaded into the partition in which you are currently running the menu utility, you will not return to the menu utility.

## Notes:

1. The menu utility can access only programs and procedures that reside on the same diskette or disk as the SYSMCR data set.
2. The menu utility cannot access the following:
  - A SYSMCR data set that is on a volume-protected diskette
  - A SYSMCR data set that is a password-protected disk data set
  - A program or procedure that is a password-protected disk data set
  - An ASCII diskette.

## SKIPPING MENU OPTIONS

If you are familiar with your menu configuration, you can skip levels. You do this by entering the options you want, separated by a period, in the select option field. For example, if you enter "3.1.12" in the level 1 menu prompt, this is what you have selected: option 3 of the level 1 menu, option 1 of the level 2 menu, and option 12 of the level 3 menu.

You may also skip from any menu to any other menu. You do this by entering an equal sign followed by the sequence you would enter on the level 1 prompt. The sequence would be as follows:

```
=M
=M.S
=M.S.P
```

where M is the level 1 option, S is the level 2 option, and P is the level 3 option.

**Note:** If only one option is configured for a level 1 or level 2 menu, the utility selects that option automatically without displaying the menu. You must include the automatically-selected options when you skip menus. (Automatically-selected options are always 1.)

The following examples show how you may use skipping:

| Menu Configuration: |                                                     |                                                                                                  |                                              |
|---------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------|
| Level 1             | 1. Accounting Information                           | 2. System Diskette                                                                               |                                              |
| Level 2             | 1. Ledger                                           | 1. Utilities                                                                                     | 2. Procedures                                |
| Level 3             | 1. ACCTPAY<br>2. ACCTRCV<br>3. PAYROLL<br>4. ASSETS | 1. SYSINIT<br>2. SYSCOPY<br>3. SYSLIST<br>4. SYSKEU<br>5. SYSLABEL<br>6. SYSPRINT<br>7. SYSBROWS | 1. PROC1<br>2. PROC2<br>3. PROC3<br>4. PROC4 |

| Example entry:               |        |                                        |
|------------------------------|--------|----------------------------------------|
| Present menu                 | Entry  | Result                                 |
| Level 1                      | 2.2.2  | Load PROC2                             |
| Level 1                      | 1      | Display level 3 (Ledger) menu          |
| Level 1                      | 1.1    | Display level 3 (Ledger) menu          |
| Level 1                      | 1.1.4  | Load ASSETS                            |
| Level 1                      | 1.2.1  | Error                                  |
| Level 2 System Diskette menu | 1.2    | Load SYSCOPY                           |
| Level 2 System Diskette menu | =1.1   | Display level 3 (Ledger) menu          |
| Level 2 System Diskette menu | =2.1.7 | Load SYSBROWS                          |
| Level 3 Ledger Menu          | =2.2.4 | Load PROC4                             |
| Level 3 Ledger Menu          | =2.1   | Display level 3 (Utilities) menu       |
| Level 3 Ledger Menu          | =2     | Display level 2 (System diskette) menu |

## USING THE FUNCTION KEYS

**Home** You can press the Home (record backspace) key to return to the previous menu level.

**Cancel** If you press the Cncl key, the menu utility displays the change level 1 menu prompt (41-05). You may want to use the Cncl key if you have rearranged diskettes in the diskette drives or if you want to respecify SYSMCR data sets.

## OPERATION OF THE MENU UTILITY

### Load the Menu Utility (05-00)

To load the utility, respond to the following prompt:

```
0 0001 A 16 40
Program name:
Device address:
Partition number:
```

Press ENTER

05-00

1. If necessary, insert the diskette containing the utility into a diskette drive.
2. Enter SYSMENU as the program name.
3. Enter the device address.
4. Enter the number of the partition where the program will execute. (If a partition number is not entered, the number defaults to the number of the partition associated with the keyboard at which you are working.)
5. Press the Enter key.

The system loads the utility. The utility displays the SYSMENU in process prompt (41-77), while it searches the device drives for the level 1 menu options. (See "Change Level 1 Menu (41-05)" on page 15-9 for more information.) When the device drive search is successfully completed, the level 1 menu prompt (41-01) is displayed.

## SYSTEMENU in Process (41-77)

When the drives are being searched, the following prompt is displayed:

```
0
SYSTEMENU in process.
```

41-77

After the drive search is successfully completed, the level 1 menu prompt (41-01) is displayed. (If the level 1 menu has only one entry, the level 2 menu prompt (41-02) is displayed.)

**Note:** It is possible for errors to be displayed while this prompt appears. For example, if a drive is already being used and cannot be shared, the menu utility displays an error. If you press the Reset key, the menu utility does not access the diskette or disk in the drive that caused the error. If the diskette or disk has a SYSMCR data set on it and you want to access it with the menu utility, you must correct the problem and either restart the menu utility or press the Cncl key to change the level 1 menu.

## Level 1 Menu (41-01)

When the SYSMCR data sets have been located, a prompt similar to the following prompt is displayed:

```
0 0001 N 07 40
Select option: 1 | | | | | | | | LEVEL 1 DRIVE
1. ACCOUNTING INFORMATION 4000
2. SYSTEM DISKETTE 4400
3. SCHEDULES 4800
4. EMPLOYEE BENEFITS 4C00
5. COMMUNICATION PROGRAMS 5000
99. Exit
 Press ENTER 41-01
```

Select an option and press the Enter key:

- If you select a level 1 menu option, the level 2 menu prompt (41-02) is displayed.
- If you select option 99, the utility complete prompt (41-78) is displayed.

The level 1 menu options are the titles you have entered with the menu configuration utility (SYSMCU) in prompt 42-11.

The menu options are displayed in the order you enter them in prompt 41-05. If you have never entered SYSMCR data set names or device addresses in prompt 41-05, information is displayed from SYSMCR data sets named SYSMCR on each device.

### Notes:

1. If you rearrange the diskettes in the drives after the the menu utility is started or restarted, the level 1 menu will not be accurate. You must press the Cncl key to change the level 1 menu or restart the menu utility to display the current level 1 options.
2. When you have selected a level 1 option, the SYSMCR data set associated with that option remains open until you return to the level 1 prompt (41-01) or exit the menu utility.

## Level 2 Menu (41-02)

If you selected a level 1 menu option, a prompt similar to the following prompt is displayed:

```
0 0001 N 07 40
Select option: | | | | | | | |
1. UTILITIES
2. PROCEDURES
99. Return
 Press ENTER
 41-02
 DRIVE = XXXX
 LEVEL 2
```

Select an option and press the Enter key:

- If you select a level 2 menu option, the level 3 menu prompt (41-03) is displayed.
- If you select option 99, the level 1 menu prompt (41-01) is displayed.

The level 2 menu options are the titles you have entered with the menu configuration utility (SYSMCU) in prompt 42-22.

## Level 3 Menu (41-03)

If you selected a level 2 menu option, a prompt similar to the following prompt is displayed:

```
0 0001 N 07 40
Select option: | | | | | | | | LEVEL 3 DRIVE = XXXX
1. DISKETTE INITIALIZATION
2. SYSCOPY--DISKETTE COPY UTILITY
3. SYSLIST--DISKETTE LABEL LIST UTILITY
4. SYSKEU--KEY ENTRY UTILITY
5. SYSLABEL--DISKETTE LABEL LIST UTILITY
6. SYS$PRINT--DISKETTE PRINT UTILITY
7. SYSBROWS--DATA SET DISPLAY UTILITY
99. Return
 Press ENTER 41-03
```

Select an option and press the Enter key:

- If you select a level 3 menu option, the associated program or procedure is loaded.
- If you select option 99, the level 2 menu prompt (41-02) is displayed.

The level 3 menu options are the descriptions you have entered with the menu configuration utility (SYSMCU) in prompt 42-34.

**Note:** Up to 20 level 3 menu options plus option 99, Return, can be displayed on a 1920-character screen. Up to 8 level 3 menu options plus option 99, Return, can be displayed on a 960-character screen. (If you select a level 2 menu option with more than 8 level 3 menu options, on a 960-character screen, an error will occur. Press the reset key. The first 8 level 3 menu items will be displayed. You may select only from these 8 items.)

## Change Level 1 Menu (41-05)

When you press the Cncl key, this prompt or a prompt similar to this prompt is displayed:

```
O 0001 A 08 E2

SYSTEMU - MENU UTILITY
Enter information for menu configuration data sets.
Data set name: SYSMCR Device address: 4000
 SYSMCR 4400
 SYSMCR 4800
 SYSMCR 4C00
 SYSMCR 5000
 SYSMCR 5400
 SYSMCR 5800
 SYSMCR 5C00
```

Press ENTER

41-05

Make the name and address changes you want, and press the Enter key. The menu utility displays the menu utility in process prompt (41-77) while it searches the device addresses for the corresponding data sets displayed on this prompt. When the data sets are found, the level 1 menu prompt (41-01) is displayed. (If this prompt has only one menu data set, prompt 41-02 is displayed.)

The menu utility on the IBM-supplied utilities diskette has the defaults shown on the above prompt. (SYSMCR is the default data set name for each possible device address.) If you do not change this prompt, the menu utility searches each device address for a data set named SYSMCR.

When you change this prompt and press the Enter key, the changes you make are written to your menu utility. (The menu utility must be in the same device drive as the one you loaded the menu utility from.) When you restart the menu utility, the utility searches only for the device addresses and the data sets you specify. (It does not search each device address for data sets named SYSMCR.)

You can use this prompt for the following:

- Change default SYSMCR data set names to SYSMCR data set names you have defined
- Change device addresses and data set names to access more than one SYSMCR data set per device
- Blank out the SYSMCR data set names and device addresses you do not want the menu utility to access. (This speeds the operation of the menu utility.)

**Notes:**

1. If you enter a data set name that is valid, but not located on the specified device, no error is displayed and the data set specified is ignored. However, this slows the operation time of the menu utility. \*
2. Error 9946 is displayed if the utility does not locate any specified SYSMCR data sets. Press the Reset key, and then press the Cncl key to respecify the data set names and addresses.

**Menu Utility Complete (41-78)**

When SYSMENU is exited normally (via option 99), the utility-completed prompt (41-78) is displayed. You may exit from or restart the menu utility. If you restart the menu utility, the SYSMENU in process prompt (41-77), then the level 1 menu prompt (41-01) is displayed.

**Menu Utility Terminated (41-79)**

If the utility is terminated before normal completion, the utility-terminated prompt (41-79) is displayed, allowing you to exit from or restart the menu utility. If you restart the menu utility, the SYSMENU in process prompt (41-77), then the level 1 menu prompt (41-01) is displayed.

## CHAPTER 16. THE MENU CONFIGURATION UTILITY (SYSMCU)

The menu configuration utility (SYSMCU) allows you to prepare a menu data set structure through easy-to-use prompts. You can use this data set with the menu utility (SYSMENU) to access programs or procedures. You can allow the utility to automatically select the smallest available partition to load the program, or you can specify a particular partition in which to load the program.

All menu information is stored in a SYSMCR (menu configuration record) data set. The menu configuration utility prompts you to:

- Allocate and create a SYSMCR data set
- Add, modify, or delete menu information
- Store the SYSMCR data set
- Print the current SYSMCR data set.

You may have multiple SYSMCR data sets for a diskette or disk. However, each SYSMCR data set must have a unique data set name and be organized in these three levels:

1. Level 1 is a description or title. Only one level 1 title is allowed for each diskette or disk.
2. Level 2 consists of the titles or descriptions of groups of programs or procedures. You can have up to six level 2 titles for each level 1 title.
3. Level 3 consists of the programs, procedures, and comments you want to display or access. Each level 3 item consists of:
  - The data set name of a program or procedure
  - Your description of the program or procedure
  - The partition you want the program or procedure to be loaded into
  - The minimum partition size for the program or procedure.

You can have up to 20 level 3 items for each level 2 title in your SYSMCR data set. With the 960-character screen, you can access only the first eight level 3 items for the menu utility (SYSMENU).

## CREATING A NEW DATA SET

For each new data set the menu configuration utility will prompt you to allocate a SYSMCR data set. Using the appropriate prompts, build your SYSMCR data set in this sequence:

1. Name the SYSMCR data set.
2. Add the level 1 title.
3. Add all the level 2 titles.
4. Add all level 3 items for each level 2 title.
5. Store the SYSMCR data set.

## MODIFYING AN EXISTING DATA SET

If you are modifying an existing data set:

1. Choose the level you want to update.
2. Specify the add, update, or delete option.
  - To add new level 2 menus, follow the sequence of steps three and four in "Creating a New Data Set."
  - For other changes, follow the prompts as they appear.
3. Store the SYSMCR data set.

**Note:** To delete the entire data set, see "Chapter 3. The Label Maintenance Utility (SYSLABEL)" on page 3-1.

You can use the Cmd, End-of-job key sequence to terminate the menu configuration utility. If you are in levels 1, 2, or 3 the utility prompts you to either save or delete the information you have entered.

## VIEWING CHANGES TO A SYSMCR DATA SET

To look at changes you are making to a SYSMCR data set, load the menu configuration utility (SYSMCU) in one partition and the menu utility (SYSTEMENU) in another partition. You can use the menu utility to display the current level 2 or level 3 menu while you make changes with the menu configuration utility. After you have stored the SYSMCR data set, you can display the updated level 2 and level 3 menus.

**Note:** When you store a SYSMCR data set, the menu utility cannot be accessing a level 2 or a level 3 menu associated with that diskette

or disk drive. (Return to the level 1 menu or go to a level 2 or a level 3 menu of another drive.)

The following example shows how you can view and make changes to a level 2 menu:

### Partition X - Menu Utility

#### 1. Display level 2 menu

```
0 0001 N 07 40
Select option: LEVEL 2 DRIVE = 4400
1. UTILITIES
2. PROCEDURES
99. Return
Press ENTER 41-02
```

#### 4. Return to the level 1 menu (because 'Drive=4400' in prompt 41-02 is the same as 'Device address: 4400' in prompt 42-04.)

```
0 0001 N 07 40
Select option: LEVEL 1 DRIVE
1. ACCOUNTING INFORMATION 4000
2. SYSTEM DISKETTE 4400
99. Exit
Press ENTER 41-01
```

#### 7. Display updated level 2 menu

```
0 0001 N 07 40
Select option: LEVEL 2 DRIVE = 4400
1. UTILITIES
2. PROCEDURE A
3. PROCEDURE B
99. Return
Press ENTER 41-02
```

### Partition Y - Menu Configuration Utility

#### 2. Add a level 2 option

```
Enter title for Level 2 menu option 3:
PROCEDURE B
Press ENTER 42-22
```

#### 3. Modify a level 2 option

```
Enter title for Level 2 menu option 2:
PROCEDURE A
Press ENTER 42-22
```

#### 5. Store the SYSMCR data set.

```
The menu information is to be stored on diskette.
Insert menu configuration data set diskette and enter
Data set name: SYSMCR
Device address 4400
Press ENTER 42-04
```

#### 6. Utility complete

```
0 SYSMCU
Utility completed.
Options are
1. Restart
2. Exit
Select option: Press ENTER 42-78
```



## Load SYSMCR (42-01)

When the utility is loaded, the following prompt is displayed:

```
SYSMCU - MENU CONFIGURATION UTILITY
Insert menu configuration data set diskette and enter
Data set name: SYSMCR
Device address: U111
 Press ENTER
42-01
```

1. If necessary, insert the diskette with the menu configuration data set you want to use into a diskette drive.
2. Enter the name of the SYSMCR data set you are creating or modifying. (SYSMCR is displayed as a default.)
3. Enter the device address.
4. Press Enter.

If the SYSMCR data set is not found on the diskette or disk, the allocate SYSMCR prompt (42-02) is displayed.

If the SYSMCR data set is found on the diskette or disk, the menu configuration utility in process prompt (42-77) is displayed. Then the menu configuration options prompt (42-03) is displayed.

## Allocate SYSMCR (42-02)

If the SYSMCR data set is not found on the diskette or disk, the following prompt is displayed:

```
Data set XXXXXXXX not found on device XXXX.
Options are
 1. Allocate
 2. Reenter
Select option: 1 Press ENTER 42-02
```

1. Select an option.
2. Press the Enter key.

If you select option 1, the menu configuration utility in process prompt (42-77) is displayed. The data set is allocated and then the menu configuration options prompt (42-03) is displayed.

If you select option 2, no SYSMCR data set is allocated and the load SYSMCR prompt (42-01) is displayed.

## Menu Configuration Options (42-03)

If the SYSMCR data set has been found on the diskette or disk, the following prompt is displayed:

```
What do you want to do with menu information?
Options are
 1. Change Level 1 menu 4. Store menu on diskette
 2. Change Level 2 menu 5. Print menus
 3. Change Level 3 menu
Select option: Press ENTER
```

42-03

Select an option and press the Enter key.

- Enter a 1 to add or change level 1 menu information. The level 1 title prompt (42-11) is displayed.
- Enter a 2 to add or change level 2 menu information. The change level 2 menu options prompt (42-21) is displayed.
- Enter a 3 to add or change level 3 menu information. The specify level 2 menu prompt (42-31) is displayed.

**Note:** You must have a level 2 menu before you can add a level 3 menu item.

- Enter a 4 to store all of the added and changed menu information on the diskette or disk. The save SYSMCR prompt (42-04) is displayed.

Make all changes to the data set before selecting option 4.

- Enter a 5 to print the current menu information for this SYSMCR data set. The print SYSMCR prompt (42-41) is displayed.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).



## Change Level 2 Menu Options (42-21)

If you selected change level 2 menu in the menu configuration prompt (42-03), the following prompt is displayed:

```
Change Level 2 menu information. X - X of 6 menus are defined.
Level 1 menu option XXX
Options are
 1. Add a menu 3. Delete a menu
 2. Update a menu 4. Return
Select option: Press ENTER 42-21
```

Select an option and press the Enter key:

- Enter a 1 to add a new level 2 menu. The add level 2 menu prompt (42-22) is displayed.
- Enter a 2 to modify an existing level 2 menu. The specify update level 2 menu prompt (42-23) is displayed.
- Enter a 3 to delete an existing level 2 menu. The specify delete level 2 option menu prompt (42-24) is displayed.
- Enter a 4 if you have completed all the level 2 menu information. The menu configuration options prompt (42-03) is displayed.

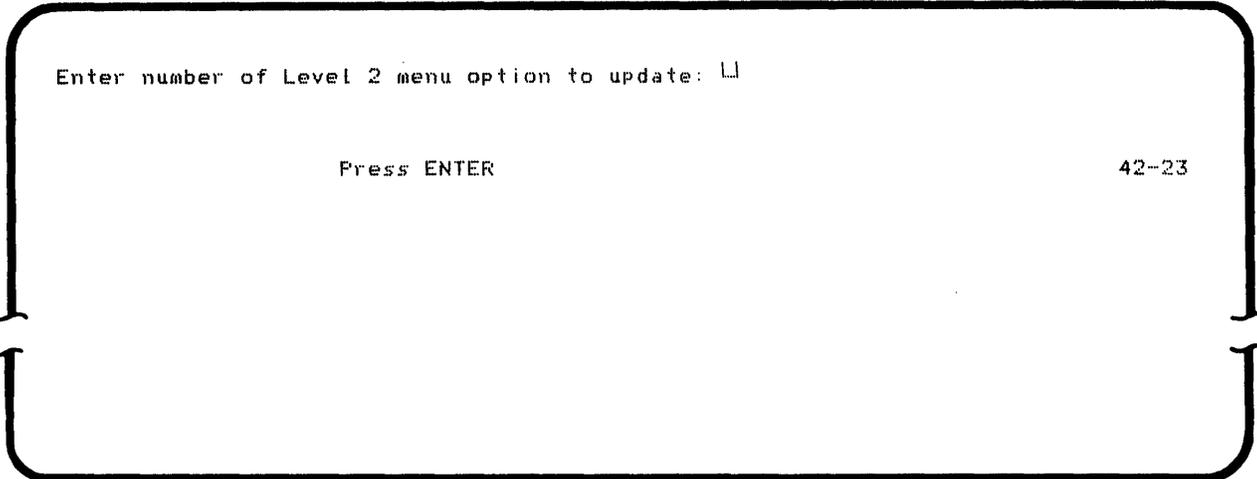
The first line of the display tells you the range of options that are now on this level 2 menu. For example, if you currently have three level 2 options, the display shows '1 - 3 of 6 menus are defined.'

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).



## Specify Update Level 2 Menu (42-23)

If you selected update a menu in the level 2 menu options prompt (42-21), the following prompt is displayed:



The screenshot shows a terminal window with a rounded rectangular border. Inside, the text reads: "Enter number of Level 2 menu option to update: |". Below this, centered, is "Press ENTER". To the right of the screen is the label "42-23".

Enter the option number of the level 2 menu you want to update and press the Enter key. The add level 2 menu prompt (42-22) is displayed.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Specify Delete Level 2 Menu (42-24)

If you selected delete level 2 menu in the change level 2 menu options prompt (42-21), the following prompt is displayed:

Enter number of Level 2 menu option to delete: LJ

Press ENTER

42-24

Enter the option number of the level 2 menu you want to delete and press the Enter key. The delete level 2 menu prompt (42-25) is displayed.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Delete Level 2 Menu (42-25)

If you have entered a number of a level 2 menu option in the specify delete level 2 menu prompt (42-24), the following prompt is displayed:

```
Level 2 menu option X was selected for deletion.
XX
Do you want the option deleted?
Options are
 1. Yes 2. No
Select option: Press ENTER
```

42-25

Select an option and press the Enter key.

The level 2 menu options prompt (42-21) is displayed.

If you select option 1, the displayed level 2 menu and any level 3 menus associated with it are all deleted. All of the remaining level 2 menu titles will be renumbered sequentially. For example, if you delete level 2 menu option number 3, the previous level 2 menu option number 4 is now the new level 2 menu option number 3.

If you select option 2, the displayed level 2 menu is not deleted.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Specify Level 2 Menu (42-31)

If you have selected change level 3 menu in the menu configuration prompt (42-03), the following prompt is displayed:

```
Level 3 menu information is to be changed.
Selecting a Level 2 menu option will access a Level 3 menu.
Enter number of a Level 2 menu option: U
```

Press ENTER

42-31

Enter the option number of the level 2 menu you need as the source structure for level 3 menu changes. Press the Enter key.

The level 3 menu options prompt (42-32) is displayed.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Level 3 Menu Options (42-32)

If you have entered the number of the level 2 menu option in the specify level 2 menu prompt (42-31), the following prompt is displayed:

```
Change Level 3 menu information. XX - XX of 20 items are defined.
Level 2 menu option XXX
Options are
 1. Add a menu item 3. Delete a menu item
 2. Update a menu item 4. Return
Select option: Press ENTER 42-32
```

Select an option and press the Enter key.

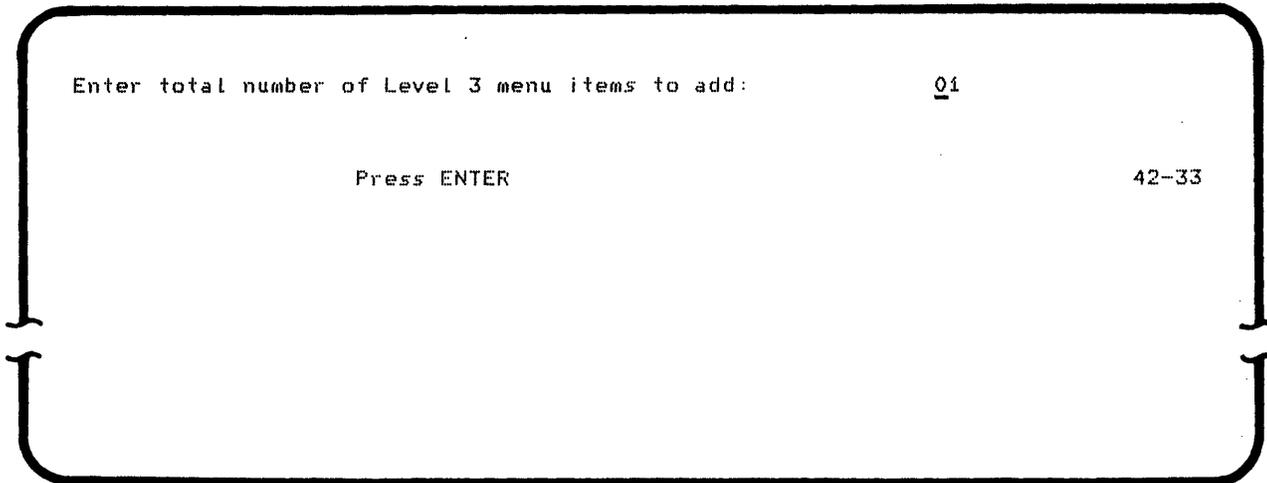
- Enter a 1 to add a new level 3 menu item. The specify repeat of adds prompt (42-33) is displayed.
- Enter a 2 to modify an existing level 3 menu item. The specify repeat of updates prompt (42-35) is displayed.
- Enter a 3 to delete a level 3 menu item. The specify delete program prompt (42-37) is displayed.
- Enter a 4 if you have completed all of the level 3 information for this level 2 menu option. The menu configuration options prompt (42-03) is displayed.

The first line of the display tells you the range of options that are now on this level 3 menu. For example, if you currently have six level 3 options, the display will show '01 - 06 of 20 items are defined.'

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Specify Repeat of Adds (42-33)

If you selected to add a menu in the level 3 menu option prompt (42-32), the following prompt is displayed:



The screenshot shows a terminal window with a rounded rectangular border. The text inside the window is as follows:

```
Enter total number of Level 3 menu items to add: 01
 01

 Press ENTER 42-33
```

Enter the total number of level 3 menu items you will add to the menu associated with the level 2 option number you specified in prompt 42-31. Press the Enter key.

The add program prompt (42-34) is displayed.

A default value of 1, for a single addition, is displayed. If you enter a number greater than 1, but not greater than the unused level 3 menu items available, prompt 42-34 will repeat the number of times you specify in this prompt.

**Note:** If you enter a number greater than the unused level 3 menu items available, error message 9405 is displayed. Press the Reset key; this prompt is redisplayed with a default value of the total number of available level 3 menu items.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Specify Repeat of Updates (42-35)

If you selected to update a menu item in the level 3 menu option prompt (42-32), the following prompt is displayed:

```
Enter total number of Level 3 menu items to update: 01
 01
 42-35
Press ENTER
```

Enter the total number of level 3 menu items you will modify at this time. Press the Enter key.

The specify update program prompt (42-36) is displayed.

A default value of 1, for a single modification, is displayed. If you enter a number greater than 1, but not greater than the number of available level 3 menu items, prompts 42-36 and 42-34 will continue to repeat the number of times you specify in this prompt.

**Note:** If you enter a number greater than the number of available level 3 menu items, error message 9405 is displayed. Press the Reset key; this prompt is redisplayed with a default value of the total number of existing menu items.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Specify Update Program (42-36)

If you have entered a number for specify repeat of updates prompt (42-35), the following prompt is displayed:

Enter number of Level 3 menu item to update:

Press ENTER to continue

42-36

Enter the option number of the level 3 menu item you want to update and press the Enter key.

The add program prompt (42-34) is displayed.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Add Program (42-34)

If you have entered add or update a level 3 menu, the following prompt is displayed:

```
Enter information for Level 3 menu item XX.
Name: □□□□□□□□□□□□□□□□
Description:
Partition: *
Partition size in K bytes:
Press ENTER to continue
```

42-34

1. Enter the data set name of the program or procedure to access with the menu utility (SYSMENU).
2. Enter the description of the program or procedure. The description can be from 0 to 50 characters and is displayed by the menu utility (SYSMENU) as a level 3 menu option in prompt 41-03. If you want the program name to be displayed in prompt 41-03, you should include it as part of the description.
3. Enter the partition you want the menu utility to load this program into. Valid entries are:
  - Blank: the utility will load the program into the partition in which the menu utility is active.
  - 0 through 7: the utility loads the program into the partition you specify. (Do not specify a foreground partition unless you will always use that partition for the menuutility.)
  - \* (asterisk): the utility automatically loads the program into the smallest available background partition in which it fits. If you are adding a level 3 menu item, an asterisk is displayed as a default.
4. Enter a partition size if this program or procedure requires more partition space to operate than to load. For example, a DE/RPG program may load into a 10K partition, but requires 13K to operate. In this case you would enter an asterisk in the partition field and 13 in the partition size field. (Valid entries are blanks or 06 to 64.)
5. Press the Enter key.

When you have added or updated the number of level 3 menu items specified in prompts 42-33 or 42-35, the level 3 menu options prompt (42-32) will be displayed.

**Note:** If you enter two asterisks as the name, the description is displayed by the menu utility (SYSMENU) as an information or comment line. (No program or procedure is available through selection of this option in the menu utility.)

The name and description fields are not checked for any syntactical or logical conventions. For example, the name field is not checked to determine if the data set name is present on the diskette or disk. (The name field cannot be left blank.)

If you are adding a new level 3 menu item, the option number, XX, is the next open sequential option number.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Specify Delete Program (42-37)

If you selected delete level 3 menu in the level 3 options prompt (42-32), the following prompt is displayed:

```
Enter number of Level 3 menu item to delete: 1

 Press ENTER 42-37
```

Enter the option number of the level 3 menu item you want to delete and press the Enter key. The delete program prompt (42-38) is displayed.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Delete Program (42-38)

If you have entered an option number of a level 3 menu item in the specify delete program prompt (42-37), the following prompt is displayed:

```
Level 3 menu item XX was selected for deletion.
XX
Do you want the item deleted?
Options are
 1. Yes 2. No
Select option: Press ENTER
```

42-38

Select an option and press the Enter key. The level 3 menu option prompt (42-32) is displayed.

If you select option 1, the displayed level 3 menu item is deleted. All of the remaining level 3 menu items are renumbered sequentially.

If you select option 2, the displayed level 3 menu item is not deleted.

The Cmd, End-of-Job key sequence displays the EOJ save SYSMCR data set prompt (42-06).

## Save Menu Configuration Records (42-04)

If you selected store menus on diskette or disk in the menu configuration prompt (42-03), the following prompt is displayed:

```
The menu information is to be stored on diskette.
Insert menu configuration data set diskette and enter
Data set name: SYSMCR
Device address:
 Press ENTER
```

42-04

1. If necessary, insert the diskette on which you want to store this menu record.
2. Enter the device address.
3. Press the Enter key.

The SYSMCR data set name and device address you entered on the load SYSMCR prompt (42-01) is displayed as a default.

If no SYSMCR data set has been allocated for this diskette or disk, the allocate SYSMCR prompt (42-02) is displayed.

Otherwise, the store SYSMCR prompt (42-05) is displayed.

## Store the SYSMCR Data Set (42-05)

If the SYSMCR data set is found on the diskette or disk, the following prompt is displayed:

```
Data set XXXXXXX found on device XXXX.
Options are
 1. Store in existing data set
 2. Reenter
Select option: Press ENTER 42-05
```

Select an option and press the Enter key.

If you select option 1, the current menu information (with all of the menu information changes you have made) will be stored in the SYSMCR data set. While the utility is storing the menu information, the menu configuration utility in process prompt (42-77) is displayed. When the process is complete the menu configuration utility complete prompt (42-78) is displayed.

If you select option 2, the menu information is not stored and the save SYSMCR prompt (42-04) is redisplayed.

## EOJ Save SYSMCR (42-06)

If you terminate the utility with the Cmd, End-of-Job key sequence during menu information changes, the following prompt is displayed:

```
SYSMCU termination in process.
Do you want to save menu information?
Options are
 1. Yes
 2. No
Select option: Press ENTER
```

42-06

Select an option and press the Enter key.

If you select option 1, the save menu configuration utility prompt (42-04) is displayed.

If you select option 2, the current menu information you have entered is not saved. The menu configuration utility terminated prompt (42-79) is displayed.

## Print SYSMCR (42-41)

If you selected print menus, in the menu configuration options prompt (42-03), the following prompt is displayed:

```
Enter the following printer information.
Device address: 0111
Total lines per page (1 - 255): 066
Printed lines per page (1 - 255): 055
Press ENTER
```

42-41

1. Enter the printer device address.
2. Enter the printer control information to format the output:
  - The total number of lines per page (blank and printed)
  - The total number of printed lines per page.
3. Press the Enter key.

The printing begins and the menu configuration utility in process prompt (42-77) is displayed.

This prompt displays default printer control information. If you have previously entered printer control information, that control information is the current default.

**Note:** If you terminate the printing with the Cmd, End-of-Job key sequence, the printer continues to print until the printer buffer is empty.

### Menu Configuration Utility in Process (42-77)

When the utility is processing the SYSMCR data set records, the following prompt is displayed:

```
SYSMCU in process.
```

```
42-77
```

### Menu Configuration Utility Complete (42-78)

When the store menu process is completed, the utility completed prompt (42-78) is displayed, allowing you to exit from the utility or restart the menu configuration utility. If you restart the utility, the load SYSMCR prompt (42-01) is displayed.

### Menu Configuration Utility Terminated (42-79)

If the utility is terminated before normal completion, the utility-terminated prompt (42-79) is displayed, allowing you to exit from the utility or restart the menu configuration utility. If you restart the utility, the load SYSMCR prompt (42-01) is displayed.

**Note:** If prompt 42-79 appears, no input data has been saved.



## APPENDIX A. LANGUAGE/KEYBOARD CHART

|                  | Standard Character String |            |       | Multinational |            |       |
|------------------|---------------------------|------------|-------|---------------|------------|-------|
|                  | Typewriter                | Data Entry | Proof | Typewriter    | Data Entry | Proof |
| United States    | 1                         | 2          | 3     | 4             | 5          | 6     |
| Germany          | 7                         | 8          | 9     | 10            | 11         | 12    |
| France AZERTY    | 13                        | 14         | 15    | 16            | 17         | 18    |
| France QWERTY    | 19                        | 20         | 21    | 22            | 23         | 24    |
| United Kingdom   | 25                        | 26         | 27    | 28            | 29         | 30    |
| Italy            | 31                        | 32         | 33    | 34            | 35         | 36    |
| Japan/Katakana   | 37                        | 38         | 39    | 40*           | 41*        | 42*   |
| Spanish Speaking | 43                        | 44         | 45    | 46            | 47         | 48    |
| Canadian/English | 49                        | 50*        | 51*   | 52            | 53*        | 54*   |
| Canadian/French  | 55                        | 56         | 57    | 58            | 59         | 60    |
| ASCII            | 61                        | 62*        | 63*   | 64            | 65*        | 66*   |
| Austria          | 67                        | 68         | 69    | 70            | 71         | 72    |
| Belgium          | 73                        | 74         | 75    | 76            | 77         | 78    |
| Brazil           | 79                        | 80         | 81    | 82            | 83         | 84    |
| Denmark          | 85                        | 86         | 87    | 88            | 89         | 90    |
| Finland          | 91                        | 92         | 93    | 94            | 95         | 96    |
| International    | 97                        | 98         | 99    | 100           | 101        | 102   |
| Japan/English    | 103                       | 104        | 105   | 106           | 107        | 108   |
| Norway           | 109                       | 110        | 111   | 112           | 113        | 114   |
| Spain            | 115                       | 116        | 117   | 118           | 119        | 120   |
| Sweden           | 121                       | 122        | 123*  | 124           | 125        | 126*  |
| Portugal         | 127                       | 128        | 129   | 130           | 131        | 132   |

\*Not available



## GLOSSARY

**allocation.** Assigning space on a diskette for a data set.

**alphabetic shift field.** A field type in which all characters are valid. The keyboard shift is positioned to automatically select the lower symbol on each keytop.

**alphanumeric characters.** A character set that contains both letters and digits.

**alternate cylinder.** A cylinder on a diskette that is assigned by the system to replace a cylinder that is defective.

**backup.** A diskette or data set that contains information that was copied from another diskette or data set and is used in case the original information is unintentionally altered or destroyed.

**blank fill.** In a right-adjust field, the process of filling the positions to the left of the data with blanks.

**block.** A collection of contiguous records recorded as a unit.

**blocking.** Combining two or more records into one block.

**byte.** A sequence of 8 binary digits which could represent a character and may be operated upon as a unit.

**character string comparison.** The character strings are compared character by character, from left to right, based on the standard EBCDIC collating sequence (shown in the IBM 5280 DE/RPG Reference Manual, SC21-7787).

**comparison condition.** The way a specified key value is to be compared

with the contents of the key field in the record. Valid comparison conditions are: (1) greater than, (2) less than, (3) equal, (4) greater than or equal, (5) less than or equal, (6) not equal.

**compress.** To move any unused space that exists between data sets to one contiguous area following the last data set.

**copy.** To duplicate data from one place to another, leaving the original data unchanged.

**cylinder.** Two corresponding tracks, one on each side, of a diskette 2 or 2D, or four corresponding tracks of a disk.

**data exchange.** The ability to exchange diskettes and data recorded on them with a system or device different from the one recording the data.

**data set.** An organized collection of related data records treated as a unit. In other systems, this is sometimes referred to as a file.

**data set name.** The 8-character name associated with a data set. The first character must be alphabetic, and the remaining characters can be any combination of alphabetic or numeric characters. Blanks cannot appear between characters in a name.

**DE/RPG.** Data Entry with RPG subroutines. An IBM program product that provides a means for writing programs for the IBM 5280 system.

**default value.** A value automatically chosen by the system when a value is not specified by the user.

**device address.** Two EBCDIC characters (such as D1) or four hex characters (such as 4C00) used to identify an IBM 5280 input/output device such as a diskette or disk drive, printer, or magnetic stripe reader.

**disk.** A round flat plate coated with a magnetic substance on which data is stored. A disk is located in a disk storage drive.

**disk drive.** See disk storage drive.

**disk storage drive.** The unit that contains a disk and the mechanism used to read and write data on the disk.

**diskette.** A thin, flexible magnetic disk and a semi-rigid protective jacket, in which the disk is permanently enclosed.

**diskette drive.** The mechanism used to read and write a diskette.

**EBCDIC.** Extended binary-coded decimal interchange code.

**field.** One or more bytes of related information in a record.

**field length.** The number of positions in a field.

**format 0 (zero).** A record format of single-character alphabetic shift fields. The length of the format is the record length of the opened data set.

**hexadecimal.** Pertains to a numbering system with a base of 16. (Valid digits range from 0 through F, where F represents the highest units position—15.)

**ID.** Identification.

**initial program load.** A sequence of events that loads the system programs and prepares the system for execution of jobs.

**IPL.** See initial program load.

**IPL data set.** A data set, on a diskette or disk, that contains the commands for the initial program load (IPL).

**IPL diskette.** A diskette containing the IPL data set that is used for the initial program load (IPL).

**logical identifier.** A two-character ID, in the resource allocation table, that is assigned to a physical device.

**logical relation.** The relationship among two or more comparison conditions. Valid logical relations are AND and OR. When the AND relationship is used, all comparison conditions must be met. When the OR relationship is used, one of the comparison conditions must be met.

**marked record.** A record that contains a mark that indicates that one or more fields in the record are incorrect or incomplete.

**maximum disk allocation table.** A table set up during system configuration to limit the available space allocated for a data set.

**menu.** A displayed list of items from which the operator makes a selection.

**multivolume data set.** A data set that uses more than one diskette or disk to physically store all the records in the data set.

**numeric shift field.** A field type in which all characters are valid. For data entry keyboards, the keyboard shift is positioned to automatically select the upper symbol on each data key. For typewriter keyboards, the keyboard shift is positioned to automatically select the lower symbol on each data key.

**open.** To prepare a data set for processing.

**partition.** A specified area of the IBM 5280's storage in which a program can execute.

**physical device.** A device used for input and/or output of data, such as a diskette drive or printer.

**prompt.** A message issued by a program; the prompt requests either information or an operator action to continue processing.

**record.** A collection of related data, treated as a unit.

**relative record number.** A number that specifies the location of a record in relation to the beginning of the data set.

**relative sector number.** A number that specifies the location of a sector in relation to the sequentially numbered sectors (0-129) on a disk. The IBM 5280 uses relative sector numbers for addressing on a disk.

**resource allocation table.** A table set up during system configuration to assign logical device identifiers to physical devices.

**reverse image.** Character(s) displayed as dark character(s) on a light background.

**scrolling.** The vertical or horizontal movement of data within a window (display screen).

**spanned record.** A record that is stored in more than one block.

**system configuration.** A process that specifies the various components and devices that form a particular operating system. System configuration combines user-specified options and parameters with IBM programs to produce a system having the desired form and capacity.

**wrap data set.** A data set that rewrites or overlays old information when the data set is filled.

**X.** Signifies a hexadecimal number.



## INDEX

### A

access prevention 1-12, 1-13, 1-14,  
3-2, 3-17  
accessibility field 3-2, 3-17, 8-16  
accessing programs  
    with SYSMENU 1-8, 15-1  
    restrictions 15-2  
adding data to data sets 2-3, 5-32  
additional directory information 4-7  
additional labels 8-3  
advancing records 2-3  
allocate maximum disk space 9-3  
allocating data sets 1-2, 1-21, 3-9  
    with SYSCOPY 5-33, 5-41, 5-49  
    with SYSKEU 2-14  
    with SYSLABEL 3-1, 3-8, 3-9  
    with SYS3740C 12-9  
allocating SYSMCR data set 16-6  
allocation, definition X-1  
alphabetic shift 2-6  
alphabetic shift field 2-27  
    definition X-1  
alphanumeric characters, definition X-1  
alternate cylinder 1-18  
    definition X-1  
ASCII diskettes 8-4, 8-10, 10-15

### B

backspacing records 2-3, 2-4  
backup 1-1, 1-4, 11-3  
    definition X-1  
basic exchange type 1-20  
beginning of extent 1-21  
blank fill, definition X-1  
block, definition X-1  
blocking, definition X-1  
BOE, see beginning of extent  
bypass field 2-27, 3-3, 3-19  
    description 2-27, 3-3  
    valid entries 3-19  
bypass indicator 3-3, 3-19  
    option selection 3-8, 3-19  
byte, definition X-1

### C

chaining formats 2-30  
changing data set labels 3-1, 3-2,  
3-19  
changing resource allocation  
    table entries 9-2  
changing volume labels 3-2, 3-16  
character string  
    locating with SYSBROWS 14-11  
character string comparison,  
    definition X-1  
clear utility 1-5, 7-1  
    operation 7-3  
        drop 7-4  
        free 7-4  
clearing data sets 7-5, 7-11, 7-15  
clearing diskettes 7-6  
clearing unexpired data sets 7-9,  
7-12  
clearing write-protected data  
    sets 7-8, 7-13  
Cmd, End-of-Job 1-17, 7-2  
column separators 1-9  
common function  
    name 10-14  
    options 10-2, 10-14  
    size 10-14  
comparison conditions 5-50, 6-9  
    definitions X-1  
compress utility 1-6, 11-1  
    operation 11-2  
    restrictions 11-8  
compress, definition X-1  
contents of utility diskette 1-1  
continuation characters, field 2-28  
control characters 2-32  
convert IBM 3740 programs utility 1-7  
convert 3740 programs utility 12-1  
    converting formats 12-7  
    loading programs 12-6  
    modifying before conversion 12-14  
    operation 12-3  
    retain/clear formats 12-13  
converting formats 12-7  
copy summary chart 5-2  
copy utility 1-4, 5-1  
    comparison conditions 5-50  
    deleted records 5-26, 5-42

- logical relations 5-51
- operation 5-7
- options 5-2, 5-8
  - data set 5-4, 5-24
  - image 5-3, 5-9
  - including 5-4, 5-25
  - inserting 5-4, 5-25, 5-27
  - single drive data set 1-4, 5-6, 5-55
  - specific key 5-5
  - specific record 5-5
  - specify key 5-47
  - specify record 5-39
  - volume 5-3, 5-15
- relative record numbers 5-43
- copy, definition X-1
- copying over data 5-11, 5-32
- copying protected data sets 5-15
- counters
  - data station 2-35
  - job 2-35
- creating formats 2-18, 2-20
- creation date 3-3, 3-19
- cylinder 1-18, 1-19
  - definition X-1

## D

- data entry job 2-1
- data entry operation 2-15
- data exchange, definition X-1
- data set 1-18
  - definition X-1
- data set access prevention 1-14
- data set allocation 1-21
- data set clear 7-1, 7-12
- data set copy 1-4, 5-1, 5-4, 5-24
- data set deletion 1-2, 1-21, 3-1, 3-12
- data set display utility 1-8, 14-1
  - operation 14-3
  - options 14-4
- data set drop 1-5, 1-22, 3-15, 7-1, 7-4
- data set extents 1-21
- data set free 1-5, 1-22, 3-15, 7-1, 7-4
- data set label 1-19, 3-2
  - list 4-1
  - modify 3-8, 3-18
  - print 4-5, 4-13
  - sample printout, names 4-14

- sample printout,
  - 128-character 4-14
  - sample printout, 80-character 4-13
- data set names 1-1, 3-3
- changing with SYSLABEL 3-19
- definition X-1
- requirements 3-3
- support 1-1
  - SYSCFA 1-1, 10-2, 10-14
  - SYSDPRT2 10-2
  - SYSFIGS 1-1
  - SYSHELP 1-1, 10-2, 10-14
  - SYSJJCFA 10-2
  - SYSUPO 1-1
- SYSIPLxx 10-1
- utilities 1-1
  - SYSBROWS 1-1, 1-8, 14-1
  - SYSCLEAR 1-1, 1-5, 7-1
  - SYSCOMP 1-1, 1-6, 11-1
  - SYSCOPY 1-1, 1-4, 5-1
  - SYSCPRNT 1-1, 1-7, 13-1
  - SYSINIT 1-1, 1-5, 8-1
  - SYSKEU 1-1, 1-2, 2-1
  - SYSLABEL 1-1, 1-2, 3-1
  - SYSLIST 1-1, 1-3, 4-1
  - SYSMCU 1-1, 1-8, 16-1
  - SYSTEMENU 1-1, 1-8, 15-1
  - SYSPRINT 1-1, 1-4, 6-1
  - SYSRAU 1-1, 1-5, 9-1
  - SYSSTAT 1-1, 1-6, 10-1
  - SYS3740C 1-1, 1-7, 12-1
- data set print 1-4, 6-1
- data set protection 1-14, 3-6, 3-10
- data set-protected prompt 1-14
- data station counters 2-35
- data station statistics 1-2, 2-1, 2-17, 2-37
- DE/RPG, definition X-1
- default value, definition X-1
- defective cylinders 1-18, 8-1, 8-19
  - on a disk 8-5
- define a record format 2-24
- definitions
  - cylinder 1-18
  - data entry job 2-15
  - data set 1-18
  - data set name 3-3
  - extent 1-21
  - format
    - for data entry 2-1
    - for diskette 1-19
  - sector 1-18
  - status line 1-10

- delete character 1-21, 3-6, 3-11, 3-19, 5-20, 5-34
- deleting data 1-20, 1-21
- deleting data sets 1-21, 3-1, 3-12, 3-15, 7-4
- deleting records 1-20
- deleting unexpired data sets 3-14
- device address 1-11
  - definition X-1
- device ID, logical 9-1
- digits field, exiting 1-9
- directory 4-3
  - listing 4-15
- directory information 4-7
- disk 1-22
  - cylinder 1-22
  - definition X-2
  - exchange type 1-22
  - format 1-22, 8-5
  - index cylinder 1-22
  - initialization 8-4
  - layout 1-22
  - volume label 1-22
- disk access prevention 1-13, 3-2
- disk data set access prevention 1-14
- disk drive, definition X-2
- disk format 8-5
- disk initialization 8-4
- disk storage drive, definition X-2
- diskette 1-18
  - ASCII 8-4, 8-10, 10-15
  - cylinder 1-18
  - definition X-2
  - EBCDIC 8-4, 8-10
  - extents 1-21
  - formats 1-19, 8-2
  - index cylinder 1-18, 1-19
  - layout 1-18
  - sector 1-18
  - sector sequence number 8-3
  - storage available 8-2
  - track 1-18
  - types 1-18
  - volume label 1-19, 3-2, 3-16
- diskette access prevention 1-12, 3-2
- diskette backup 1-1
- diskette clear 7-1, 7-6
- diskette compress 11-1
- diskette copy utility 5-1
- diskette drive address 1-11
- diskette drive, definition X-2
- diskette drop 7-1, 7-4
- diskette free 7-1, 7-4
- diskette label list utility 4-1

- diskette print 1-4, 6-1
- display IPL data set status 10-9, 10-14
- display prompts, general 1-9
- display system status 10-6
- display utility 14-1
  - operation 14-3
  - options 14-4
- displaying a data set 14-1
- displaying or changing a format 2-23
- drop 3-15, 7-4
- dup/skip field 2-28
- duplicate field 2-28

## E

- EBCDIC character, negative field 2-5
- EBCDIC diskettes 8-4, 8-10
- EBCDIC, definition X-2
- end of data 1-21
- end of extent 1-21
- end-of-format character 2-24, 2-29
- end-of-job key sequence 1-17, 7-2
- ending a data entry job 2-16
- enter mode 1-2, 2-1, 2-3, 2-11
- entry field 1-9
- EOD, see end of data
- EOE, see end of extent
- exchange types 1-20, 3-5, 3-19
  - changing 1-20, 3-19
- exiting fields 1-9
  - right adjust 1-9, 2-5
- exiting utility programs
  - after termination 1-17
- expiration date 3-4, 3-19
- extent 1-21

## F

- field continuation characters 2-28
- field definition characters 2-27
- field exit keys 1-9
  - field minus 2-5
  - field plus 2-5
- field length, definition X-2
- field totals 2-26
- field, definition X-2
- fill characters 2-27
  - verification 2-4, 2-5
- finding a character string 14-11
- format
  - for data entry 2-1

format control methods of print 6-5,  
6-9, 6-12  
format conversion utility 12-1  
operation 12-3  
format of disk 8-4  
format zero 2-18, 2-23  
definition X-2  
formats 2-18  
changing 2-23  
creating 2-20  
defining 2-24  
displaying 2-23  
for disk 8-5  
for diskette 1-19, 8-2  
loading 2-22  
saving 2-21  
selecting 2-23  
formats of diskettes 1-19, 8-2  
free 3-15, 7-4  
frequency of deleted records 5-28

## G

group copy 1-4, 5-1, 5-3  
group data set qualifier 1-15  
group drop 7-4  
group free 7-1, 7-4  
group print 6-1  
group qualifier 1-15

## H

H exchange type 1-20  
help screen  
for SYSBROWS 14-6  
hexadecimal print 1-4, 6-1  
example 6-17  
hexadecimal, definition X-2

## I

I exchange type 1-20  
image copy 1-4, 5-1, 5-3, 5-9  
include/omit 5-4, 5-27, 5-42  
including deleted records 5-4, 5-27,  
5-42  
index cylinder 1-19, 1-22  
initial program load, definition X-2  
initialization  
for disk 8-1, 8-4  
for diskette 8-1

initialization utility 1-5, 8-1  
operation 8-6  
inserting deleted records 5-4  
IPL 1-1  
IPL data set 1-1  
copying 5-1, 5-19  
definition X-2  
IPL data set name 10-1  
IPL data set status 10-1, 10-9  
IPL disk 1-5  
IPL diskette 1-5  
copying 5-1, 5-19  
copying to disk 5-1  
definition X-2  
IPL diskette status 10-1, 10-9  
IPL status 10-13  
displaying 10-1, 10-10  
printing 10-10  
sample printout 10-13

## J

job counters 2-35  
job statistics 2-1, 2-17, 2-35

## K

key copy 5-5  
key entry utility 1-2, 2-1  
formats 2-1, 2-18, 2-24, 2-32  
modes of operation 2-2  
operation 2-10  
shifts 2-6  
status line 2-7  
keyboard shifts 2-6  
alphabetic 2-6  
numeric 2-6

## L

label list utility 1-3, 4-1  
operation 4-2  
options 4-3  
label maintenance utility 1-2, 3-1  
operation 3-7  
options 3-8  
data set allocation 3-1, 3-9  
data set deletion 3-1, 3-12  
data set label  
modification 3-2, 3-8, 3-18

- volume label modification 3-2, 3-16
  - label modification
    - data set 3-2, 3-8, 3-18
    - volume 3-2, 3-16
  - label parameters
    - changing 1-3, 3-1
    - listing 1-3, 4-1
    - printing 1-3, 1-4, 6-1
  - language/keyboard chart A-1
  - listing labels 1-3, 4-1
  - loading a format 2-22
  - loading a program 15-1
    - with SYSMENU 15-1
      - specify partition 16-19
  - loading a utility
    - load prompt 1-11
  - logical device identifier (ID) 9-3
  - logical identifier, definition X-2
  - logical relations 5-51, 6-10
    - definition X-2

## M

- manual alphabetic field definition
  - characters 2-27
- manual fields 2-27
- manual numeric field definition
  - characters 2-27
- mark position 5-30
- marked records 5-4, 5-29
- marked records, definition X-2
- maximum disk allocation table 9-3
  - definition X-2
  - displaying partition entries 10-7
  - displaying system-shared entries 10-8
  - modifying 9-3
- menu
  - definition X-2
- menu configuration utility 1-8, 16-1
  - levels 16-1
  - operation 16-4
  - options 16-7
- menu data set (SYSMCR) 16-1
  - allocate 16-6
  - create 16-2
  - delete 16-2
  - modify 16-2
  - naming 16-5
  - printing 16-26
  - save 16-23, 16-25
  - store 16-24

- structure 16-1
    - viewing changes 16-2
  - menu facility, see menu configuration utility and menu utility
  - menu utility 1-8, 15-1
    - accessing programs and procedures 1-8, 15-1
    - loading a program 15-1
    - operation 15-4
    - skipping options 15-2
  - mode selection prompt 2-11
  - modes of operation 2-2, 2-11
    - primary
      - enter 2-3
      - update 2-3
      - verify 2-4
    - secondary 2-2
  - modifying data set labels 3-2, 3-8, 3-18
  - modifying volume labels 3-2, 3-16
  - multivolume data set 1-18
    - creating 5-6
    - definition X-2
  - multivolume indicator 3-4, 3-19
  - multivolume output support 5-22

## N

- names of support data sets 1-1
- names of utility data sets 1-1
- negative numbers
  - verifying 2-5
- new/replace 2-3, 2-11, 2-12
- nonblank diskette initialization 8-8
- number of formats available 2-19
- numeric shift 2-6
- numeric shift field 2-27
  - definition X-2

## O

- omit deleted records 5-4, 5-25
- omit marked records 5-4, 5-25, 5-29
- open, definition X-2
- operation of utilities
  - SYSBROWS 14-3
  - SYSCLEAR 7-3
  - SYSCOMP 11-2
  - SYSCOPY 5-7
  - SYS CPRNT 13-4
  - SYSINIT 8-6
  - SYSKEU 2-10

|                  |                 |       |                  |
|------------------|-----------------|-------|------------------|
| SYSLABEL         | 3-7             | 05-00 | 1-11             |
| SYSLIST          | 4-2             | 05-01 | 1-12, 1-13, 1-14 |
| SYSMCU           | 16-4            | 06-81 | 2-11             |
| SYSTEMENU        | 15-4            | 06-82 | 2-12, 12-5, 12-8 |
| SYSPRINT         | 6-3             | 06-83 | 2-13, 12-9       |
| SYSRAU           | 9-4             | 06-84 | 2-14, 12-10      |
| SYSSTAT          | 10-4            | 06-89 | 2-16             |
| SYS3740C         | 12-3            | 06-90 | 2-17             |
| owner ID default | 8-14            | 21-01 | 8-7              |
| owner identifier | 1-12, 1-13, 3-2 | 21-02 | 8-8              |
|                  |                 | 21-03 | 8-10             |
|                  |                 | 21-04 | 8-11             |
|                  |                 | 21-05 | 8-12             |
|                  |                 | 21-06 | 8-13             |
|                  |                 | 21-07 | 8-14             |
|                  |                 | 21-08 | 8-15             |
|                  |                 | 21-09 | 8-17             |
|                  |                 | 21-10 | 8-18             |
|                  |                 | 21-11 | 8-19             |
|                  |                 | 21-12 | 8-16             |
|                  |                 | 21-13 | 8-9              |
|                  |                 | 21-78 | 8-19             |
|                  |                 | 23-01 | 11-3             |
|                  |                 | 23-02 | 11-4             |
|                  |                 | 23-04 | 11-5             |
|                  |                 | 23-05 | 11-6             |
|                  |                 | 23-10 | 11-7             |
|                  |                 | 23-78 | 11-7             |
|                  |                 | 25-01 | 7-4              |
|                  |                 | 25-02 | 7-5              |
|                  |                 | 25-04 | 7-12             |
|                  |                 | 25-05 | 7-13             |
|                  |                 | 25-06 | 7-10, 7-14       |
|                  |                 | 25-07 | 7-11, 7-15       |
|                  |                 | 25-09 | 7-14             |
|                  |                 | 25-10 | 7-8              |
|                  |                 | 25-11 | 7-9              |
|                  |                 | 25-12 | 7-6              |
|                  |                 | 25-13 | 7-7              |
|                  |                 | 25-78 | 7-11, 7-15       |
|                  |                 | 27-01 | 3-8              |
|                  |                 | 27-02 | 3-9              |
|                  |                 | 27-03 | 3-10             |
|                  |                 | 27-04 | 3-11             |
|                  |                 | 27-05 | 3-12             |
|                  |                 | 27-06 | 3-13             |
|                  |                 | 27-07 | 3-15             |
|                  |                 | 27-08 | 3-16             |
|                  |                 | 27-09 | 3-17             |
|                  |                 | 27-10 | 3-18             |
|                  |                 | 27-11 | 3-19             |
|                  |                 | 27-12 | 3-14             |
|                  |                 | 27-78 | 3-20             |
|                  |                 | 29-01 | 12-4             |

## P

|                               |                     |
|-------------------------------|---------------------|
| partition                     |                     |
| definition                    | X-3                 |
| system status                 | 1-6                 |
| types                         | 10-1                |
| utilities size requirements   | 1-1                 |
| partition entries             | 9-1                 |
| partition entries for SYSRAU  |                     |
| permanent changes             | 9-7, 9-17           |
| temporary changes             | 9-19                |
| password                      | 1-14, 3-6, 3-19     |
| password protection           | 3-10                |
| password-protected prompt     | 1-14                |
| access                        | 1-14                |
| for initialization            | 8-9                 |
| permanent resource allocation |                     |
| table changes                 | 9-2, 9-6            |
| physical device address       | 9-2, 9-3            |
| physical device, definition   | X-3                 |
| positions used for format     |                     |
| chaining                      | 2-30                |
| primary mode menu             | 2-11                |
| primary modes                 | 1-2, 2-2            |
| print format control methods  | 6-1, 6-5, 6-9, 6-12 |
| print IPL status              | 10-11               |
| print utility                 | 1-4, 6-1            |
| characters per line           | 6-12                |
| formats                       | 6-5, 6-9, 6-12      |
| operation                     | 6-3                 |
| printer control information   | 6-12                |
| production statistics         | 2-1, 2-35, 2-36     |
| job                           | 2-35                |
| job station                   | 2-1                 |
| station                       | 2-35                |
| prompt numbers                | 1-10                |
| prompt, definition            | X-3                 |
| prompting format              | 2-1, 2-18, 2-32     |
| prompting message control     |                     |
| characters                    | 2-32                |
| prompts                       |                     |

|       |                                    |       |            |
|-------|------------------------------------|-------|------------|
| 29-02 | 12-7                               | 35-09 | 9-14       |
| 29-03 | 12-12                              | 35-10 | 9-17       |
| 29-04 | 12-13                              | 35-11 | 9-19       |
| 29-09 | 12-2                               | 35-12 | 9-11, 9-18 |
| 29-78 | 12-13                              | 35-13 | 9-12, 9-15 |
| 31-01 | 5-8                                | 35-78 | 9-21       |
| 31-06 | 5-11                               | 36-01 | 6-4        |
| 31-16 | 5-56                               | 36-02 | 6-5        |
| 31-22 | 5-21                               | 36-03 | 6-6        |
| 31-23 | 5-17                               | 36-04 | 6-7        |
| 31-24 | 5-18                               | 36-05 | 6-8        |
| 31-31 | 5-24                               | 36-06 | 6-9        |
| 31-32 | 5-25                               | 36-07 | 6-10       |
| 31-33 | 5-27                               | 36-08 | 6-11       |
| 31-34 | 5-28                               | 36-09 | 6-12       |
| 31-35 | 5-29                               | 36-10 | 6-13       |
| 31-36 | 5-30                               | 36-11 | 6-15       |
| 31-37 | 5-32                               | 36-12 | 6-14       |
| 31-38 | 5-36                               | 36-78 | 6-16       |
| 31-46 | 5-43                               | 36-79 | 6-16       |
| 31-51 | 5-50                               | 37-01 | 10-5       |
| 31-52 | 5-51                               | 37-02 | 10-9       |
| 31-61 | 5-9, 5-15                          | 37-03 | 10-10      |
| 31-62 | 5-10, 5-15, 5-16                   | 37-04 | 10-11      |
| 31-63 | 5-14, 5-58                         | 37-05 | 10-12      |
| 31-64 | 5-13, 5-57                         | 37-06 | 10-14      |
| 31-65 | 5-20, 5-34                         | 37-07 | 10-16      |
| 31-66 | 5-22, 5-37, 5-45, 5-53             | 37-08 | 10-17      |
| 31-67 | 5-23, 5-38, 5-46, 5-54             | 37-09 | 10-21      |
| 31-68 | 5-26, 5-42                         | 37-10 | 10-6       |
| 31-69 | 5-39, 5-47, 5-55                   | 37-11 | 10-23      |
| 31-70 | 5-31, 5-40, 5-48                   | 37-12 | 10-23      |
| 31-71 | 5-33, 5-41, 5-49                   | 37-13 | 10-24      |
| 31-77 | 5-12, 5-19, 5-35, 5-44, 5-52       | 37-14 | 10-23      |
| 31-78 | 5-14, 5-23, 5-38, 5-46, 5-54, 5-58 | 37-15 | 10-22      |
| 34-01 | 4-3                                | 37-16 | 10-15      |
| 34-02 | 4-4                                | 37-17 | 10-22      |
| 34-03 | 4-5                                | 37-18 | 10-19      |
| 34-04 | 4-8                                | 37-19 | 10-19      |
| 34-06 | 4-12                               | 37-20 | 10-20      |
| 34-07 | 4-6                                | 37-21 | 10-7       |
| 34-08 | 4-7                                | 37-22 | 10-8       |
| 34-09 | 4-9                                | 37-78 | 10-24      |
| 34-10 | 4-10                               | 39-01 | 13-5       |
| 34-78 | 4-12                               | 39-02 | 13-9       |
| 35-01 | 9-5                                | 39-03 | 13-10      |
| 35-02 | 9-6                                | 39-05 | 13-11      |
| 35-03 | 9-7                                | 39-06 | 13-12      |
| 35-04 | 9-8                                | 39-07 | 13-13      |
| 35-05 | 9-9                                | 39-08 | 13-14      |
| 35-06 | 9-10                               | 39-09 | 13-15      |
| 35-07 | 9-13                               | 39-10 | 13-16      |
| 35-08 | 9-16                               | 39-11 | 13-17      |
|       |                                    | 39-12 | 13-18      |

39-13 13-21  
39-14 13-22  
39-15 13-23  
39-16 13-24  
39-17 13-6  
39-18 13-7  
39-19 13-8  
39-20 13-19  
39-21 13-27  
39-22 13-26  
39-23 13-26  
39-24 13-25  
39-77 13-20  
39-78 13-28  
39-79 13-28  
40-01 14-4  
40-02 14-5  
40-03 14-6  
40-78 14-14  
40-79 14-14  
41-01 15-6  
41-02 15-7  
41-03 15-8  
41-05 15-9  
41-77 15-5  
41-78 15-10  
41-79 15-10  
42-01 16-5  
42-02 16-6  
42-03 16-7  
42-04 16-23  
42-05 16-24  
42-06 16-25  
42-11 16-8  
42-21 16-9  
42-22 16-10  
42-23 16-11  
42-24 16-12  
42-25 16-13  
42-31 16-14  
42-32 16-15  
42-33 16-16  
42-34 16-19  
42-35 16-17  
42-36 16-18  
42-37 16-21  
42-38 16-22  
42-41 16-26  
42-77 16-27  
42-78 16-27  
42-79 16-27

protected data set 1-14  
protected volume 1-12, 1-13

## R

rebuild maximum disk allocation  
table 9-11  
rebuild resource allocation table 9-8  
record advance 2-3  
record backspace 2-4  
record copy 5-5  
record delete character 5-20  
record format 2-18, 2-24  
record format codes 2-26  
record length 3-6, 3-19  
record mark 5-4, 5-29, 5-30  
record, definition X-3  
relative record number 5-43, 6-8  
definition X-3  
displaying 14-9  
relative sector number X-3  
resource allocation table  
definition X-3  
partition entries 9-1  
system-shared entries 9-1  
resource allocation table entries  
logical device identifier (ID) 9-1  
resource allocation utility 1-5, 9-1  
operation 9-4  
permanent changes 9-2, 9-6  
rebuild rebuild entire table 9-8  
table modification  
for logical device IDs 9-1  
for maximum disk allocation 9-3  
permanent 9-9, 9-13  
temporary 9-19  
temporary changes 9-3, 9-19  
restarting utility program  
after completion 1-16  
after termination 1-17  
reverse image, definition X-3  
right-adjust fields 2-5, 2-27

## S

saving formats 2-21  
SCP diskette 1-1, 10-1  
scrolling a data set 14-1, 14-7  
horizontally 14-9  
vertically 14-8  
scrolling, definition X-3  
SCS/BSC 3741 print utility 1-7, 13-1  
entry method 13-5  
operation 13-4

- print options 13-9
- printer format 13-14
- printer format record 13-29
- printer interrupt 13-25
- secondary modes 1-2, 2-2
- sector 1-18
- sector sequence number 8-3
- security, see volume-protection and data set protection 1-12
- selecting a format 2-23
- selecting modes 2-11
- self-check 2-26
- shifts
  - alphanumeric 2-6
  - numeric 2-6
- single drive data set copy 1-4, 5-1, 5-6, 5-55
- skip field 2-28
- spanned record, definition X-3
- specify key copy 1-4, 5-1, 5-47
- specify key print 1-4, 6-1, 6-9
- specify record copy 1-4, 5-1, 5-39
- specify record print 1-4, 6-8
- starter system IPL 10-1
- station statistics 2-1, 2-17, 2-35
- statistics for production 2-1, 2-35
- status line 1-10, 1-12
  - for SYSBROWS 14-13
  - for SYSKEU 2-7
- support data sets
  - SYSCFA 1-1, 10-2, 10-14
  - SYSFIGS 1-1
  - SYSHELP 1-1, 10-2, 10-14
  - SYSUPO 1-1
- SYSBROWS 1-1, 1-8, 14-1
- SYSCFA 1-1, 10-2, 10-14
- SYSCLEAR 1-1, 1-5, 7-1, 7-3
- SYSCOMP 1-1, 1-6, 11-1
- SYSCOPY 1-1, 1-4, 5-1
- SYSCPRNT 1-1, 1-7
- SYSDPRT2 10-2, 10-14
- SYSFIGS 1-1
- SYSHELP 1-1, 10-2, 10-14
- SYSINIT 1-1, 1-5, 8-1
- SYSIPLxx 10-1
- SYSJJCFA 10-2, 10-14
- SYSKEU 1-1, 1-2, 2-1
- SYSLABEL 1-1, 1-2, 3-1
- SYSLIST 1-1, 1-3, 4-1
- SYSMCR 16-1
- SYSMCU 1-1, 1-8, 16-1
- SYSMENU 1-1, 1-8, 15-1
- SYSPRINT 1-1, 1-4, 6-1
- SYSRAU 1-1, 1-5, 9-1

- SYSSTAT 1-1, 1-6, 10-1
- system configuration, definition X-3
- system date 3-3
- system disk 1-2
- system diskette 1-2
- system IPL 1-1, 10-1, 10-13
- system status 10-6
- system status utility 1-6, 10-1
  - operation 10-4
  - options 10-5
    - IPL data set 10-5, 10-9
    - system 10-5, 10-6
  - sample printout 10-13
- system-shared entries 9-1
  - permanent changes 9-10, 9-14
- SYSUPO 1-1
- SYS3740C 1-1, 1-7, 12-1

## T

- terminated prompt 1-17
- terminating a utility 1-17
- totals, field 2-26
- types of diskettes 1-18

## U

- unexpired data set 3-4
  - deleting 3-14
- update mode 2-3, 2-11
- user-defined IPL data set 1-1, 10-1
- utility load prompt 1-11
- utility-terminated prompt 1-17

## V

- variable fields 1-9
- verify 2-4
  - mismatch 2-5
  - mode 2-11
  - records 2-4
  - right-adjust fields 2-5
- verify mode 2-4
- verify/copy indicator 3-5, 3-19
- volume copy 1-4, 5-1, 5-3, 5-15
- volume ID 3-2
- volume ID default 8-14
- volume label 1-19, 3-2
  - listing 4-1, 4-16
  - modification 3-16
- volume protection

access 1-12, 1-13, 3-2  
clearing data sets 7-5  
creating 8-16  
volume sequence number 3-4, 3-19  
volume-protect field 3-2  
    modifying 3-17  
volume-protected prompt 1-12, 1-13

## W

wrap data set 14-4  
    definition X-3  
write-protect indicator 3-3, 3-19  
write-protected data sets 3-3  
    clearing 7-3, 7-8, 7-13  
    deleting 3-13

You may use this form to communicate your comments about this publication, its organization, or subject matter, with the understanding that IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you. Your comments will be sent to the author's department for whatever review and action, if any, are deemed appropriate.

*Note: Copies of IBM publications are not stocked at the location to which this form is addressed. Please direct any requests for copies of publications, or for assistance in using your IBM system, to your IBM representative or to the IBM branch office serving your locality.*

Possible topics for comment are:

Clarity      Accuracy      Completeness      Organization      Coding      Retrieval      Legibility

If you wish a reply, give your name, company, mailing address, and date:

---

---

---

---

PLEASE USE PRESSURE SENSITIVE OR OTHER GUMMED TAPE TO SEAL THIS FORM.

NOTE.

What is your occupation? \_\_\_\_\_

Number of latest Newsletter associated with this publication: \_\_\_\_\_

Thank you for your cooperation. No postage stamp necessary if mailed in the U.S.A. (Elsewhere, an IBM office or representative will be happy to forward your comments or you may mail directly to the address in the Edition Notice on the back of the title page.)

..... Cut or Fold Along Line .....

**Reader's Comment Form**

Fold and tape

Please Do Not Staple

Fold and tape



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

International Business Machines Corporation  
Department 506, Building 998  
11400 Burnet Rd.  
Austin, Texas 78758



Fold and tape

Please Do Not Staple

Fold and tape



International Business Machines Corporation  
General Systems Division  
PO Box 2150, Atlanta, Ga. 30055

IBM General Business Group/International  
421 Boston Post Road, Port Chester, N.Y., U.S.A. 10573

..... Cut or Fold Along Line .....



SC21-7788-4

IBM 5280 Utilities Reference/Operation Manual (File No. S5280-32) Printed in U.S.A. SC21-7788-4

