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IBM 5280 Distributed Data System

Utilities Reference/Operation Manual

Program Number 5708-UT1

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This is a major revision of, and obsoletes, SC21-7788-1 and incorporates TNL SN21-8199.

Because the changes and additions are extensive, this publication should be reviewed in its entirety. Major changes are:

SYSCOPY supports multivolume input support for data set copy.

SYSSTAT displays additional information from an IPL diskette.

This edition applies to release 3, 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 continually made to the information herein; changes will be reported in technical newsletters or in new editions of this publication.

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Preface

This manual is intended for *operators* and *programmers* who use the 5280 noncommunication 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 information in sequence.

Prerequisite Publications

- *IBM 5280 System Control Programming Reference/Operation Manual*, GC21-7824

Related Publications

- *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*, GA21-9182-2
- *IBM 5280 Message Manual*, GA21-9354

HOW TO USE THIS MANUAL

This manual contains 12 chapters and an appendix.

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

Chapters 2 through 12 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 is 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 5280 Utilities

The 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 with the IBM-supplied SCP (System Control Programming diskette) or a user-defined IPL diskette. 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 5280 utilities and 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	8 K bytes
SYSLABEL	Label maintenance utility	9 K bytes
SYSLIST	Label list utility	9 K bytes
SYSCOPY	Copy utility	9-11 K bytes
SYSPRINT	Print utility	9 K bytes
SYSCLEAR	Clear utility	9 K bytes
SYSINIT	Initialization utility	9 K bytes
SYSRAU	Resource allocation utility	9 K bytes
SYSSTAT	System status utility	9 K bytes *
SYSCOMP	Compress utility	9 K bytes
SYS3740C	3740 format conversion aid utility	9-11 K bytes

* 16 K bytes when the option to display IPL diskette contents is chosen.

Support Data Set	Description
SYSUPO	Utility programs overlay
SYSFIGS	SYSSTAT IPL diskette 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 the diskette initialization utility).

The utilities (and other programs) that are most frequently used can be copied to a user-created diskette known as a *system diskette*. Use of a system diskette 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 diskette 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 diskette 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.

THE LABEL LIST UTILITY (SYSLIST)

The label list utility lists (prints or displays) the contents of each data set label or volume label. The list can be used to determine what data sets are written on a diskette 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 diskette 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 are copied to another diskette of the same type and initialization.

- Volume Copy: The entire contents of a diskette are copied to another diskette of the same or a different type and initialization. You can copy to an empty diskette, you can add data sets to existing data sets on a diskette, or you can copy over existing data sets on a diskette.

- 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 DISKETTE PRINT UTILITY (SYSPRINT)

The following print types are available:

- Diskette print: All data sets on a diskette 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.

In addition, you can specify the number of characters per printed line and the number of lines per printed page.

THE CLEAR UTILITY (SYSCLEAR)

The clear utility drops or frees a single data set or all the data sets on a diskette. 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.

THE INITIALIZATION UTILITY (SYSINIT)

The initialization utility formats a diskette. A diskette must be initialized (that is, formatted) before it can be used. *If the initialization utility is used with a diskette that contains data, the data will no longer be available.*

THE RESOURCE ALLOCATION UTILITY (SYSRAU)

The resource allocation utility changes the logical device identifier for a physical device in the 5280 resource allocation table.

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

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

- The name of the job loaded into the partition
- The partition type (foreground or background)
- The partition size

A status check for a user-defined initial program load diskette 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 to the beginning of the diskette. This places any unused space that exists between data sets into one contiguous area on the diskette. 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 3740 FORMAT CONVERSION UTILITY (SYS3740C)

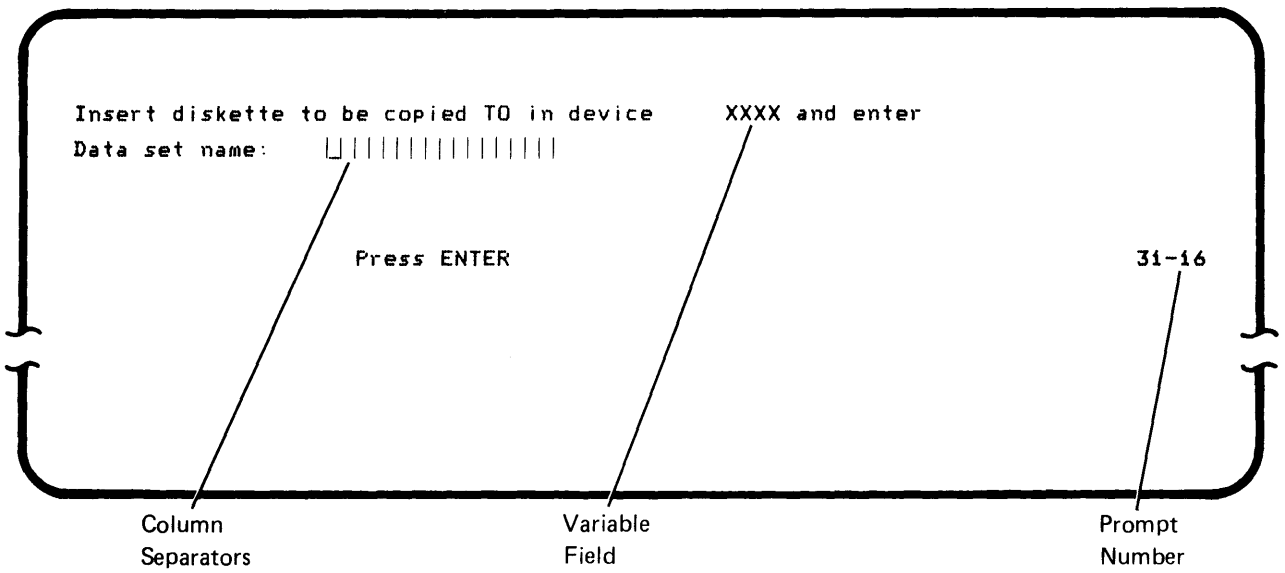
The 3740 format conversion utility converts existing 3740 format programs to DE/RPG specifications. The 3740 formats are loaded from a diskette into the system, converted to A and Z specifications, and written to a diskette.

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

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

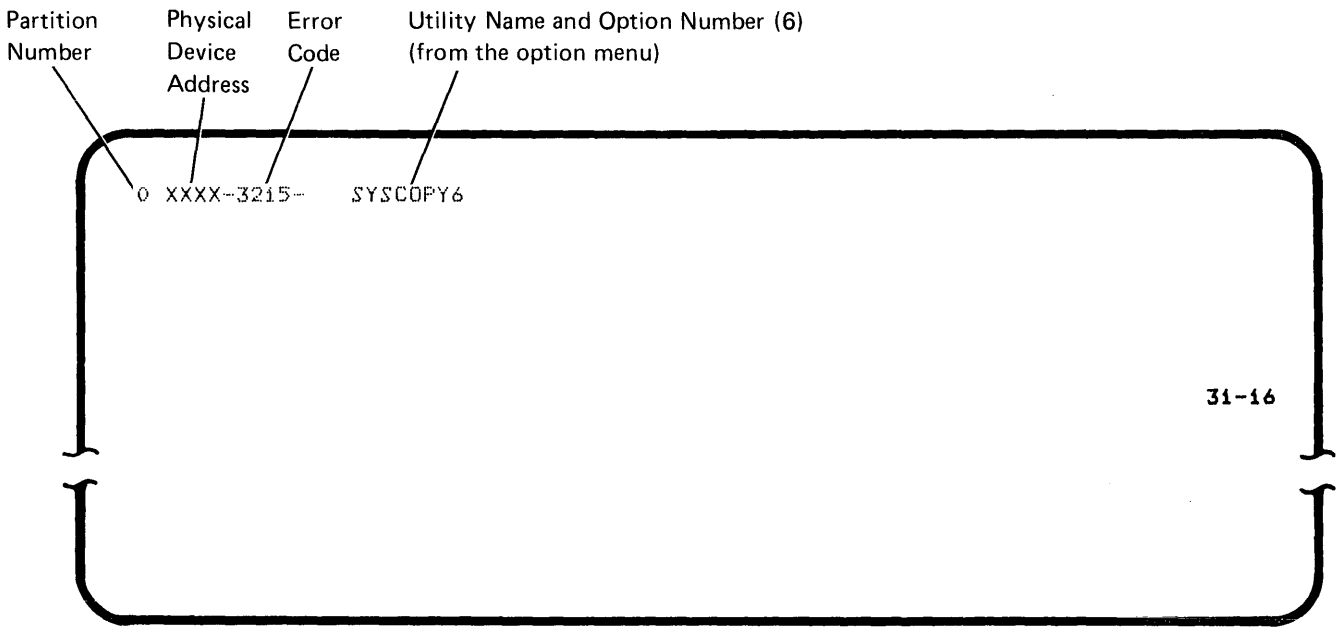
In the lower-right corner of each prompt is a four-digit number, such as 31-16 in the previous prompt. Except for a few prompts that are common to several utilities, the first two digits are unique to each utility. The second two digits identify the different prompts within the utility.

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.

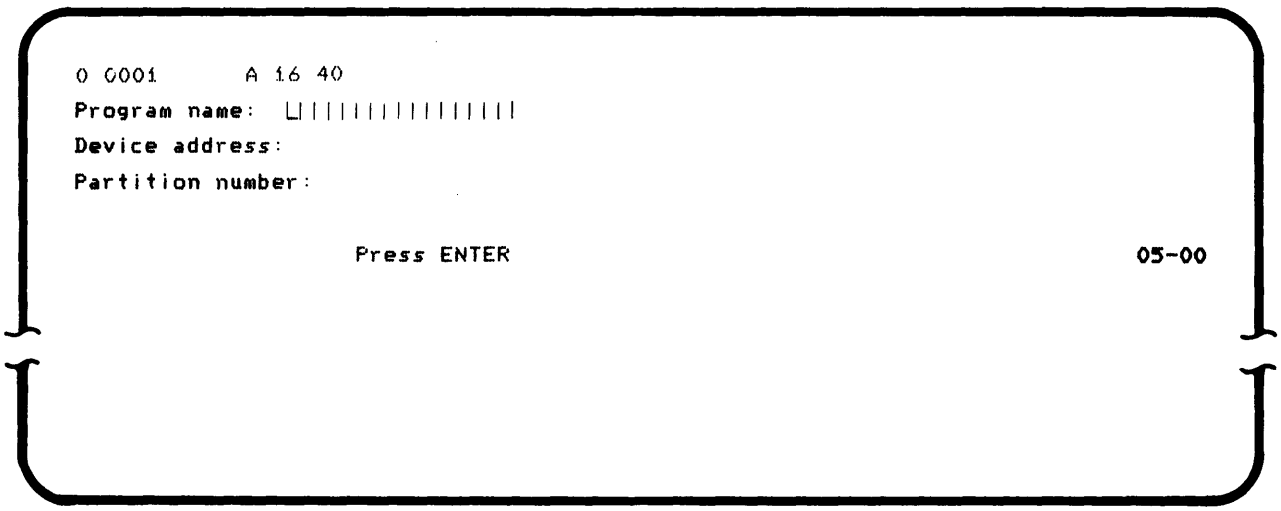
The utilities display the following information on the status line when an error occurs.



Note: See Chapter 2 for information about the status line that is displayed during use of the key entry utility.

The Load Prompt

A utility is loaded by your response to the following load prompt:



1. Insert (into the diskette drive) the diskette containing the utility.

2. Enter the program name of the utility (the name of the object code data set).

3. Enter the diskette drive address. This will be necessary only if the diskette drive address is different from the default, or if no default diskette drive address is displayed. Each diskette drive 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 5280 will load the program into the partition currently associated with the keyboard at which you are working.

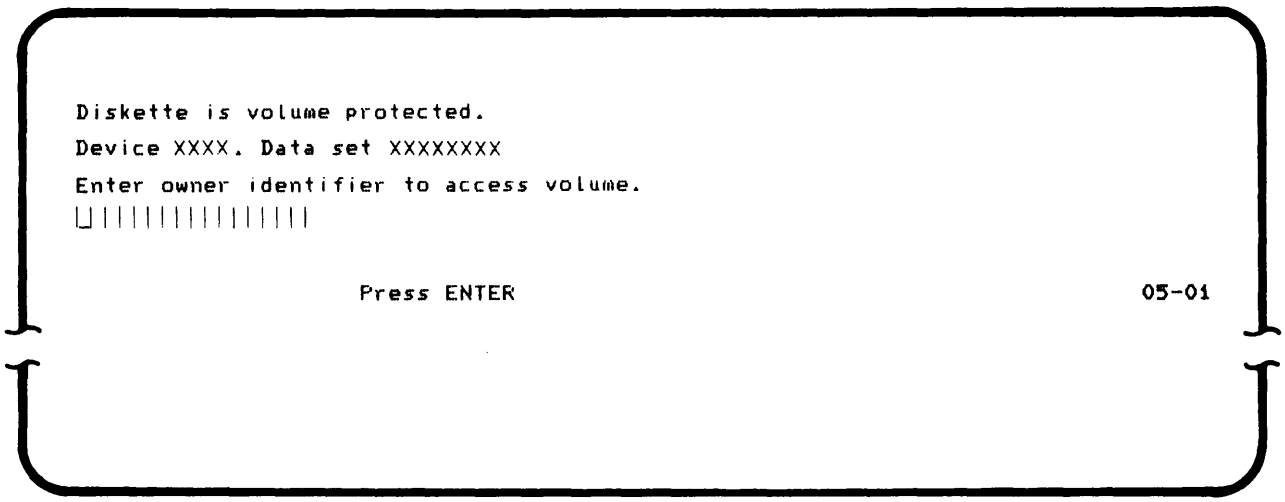
5. Press the Enter key.

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

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 Volume-Protected Prompt

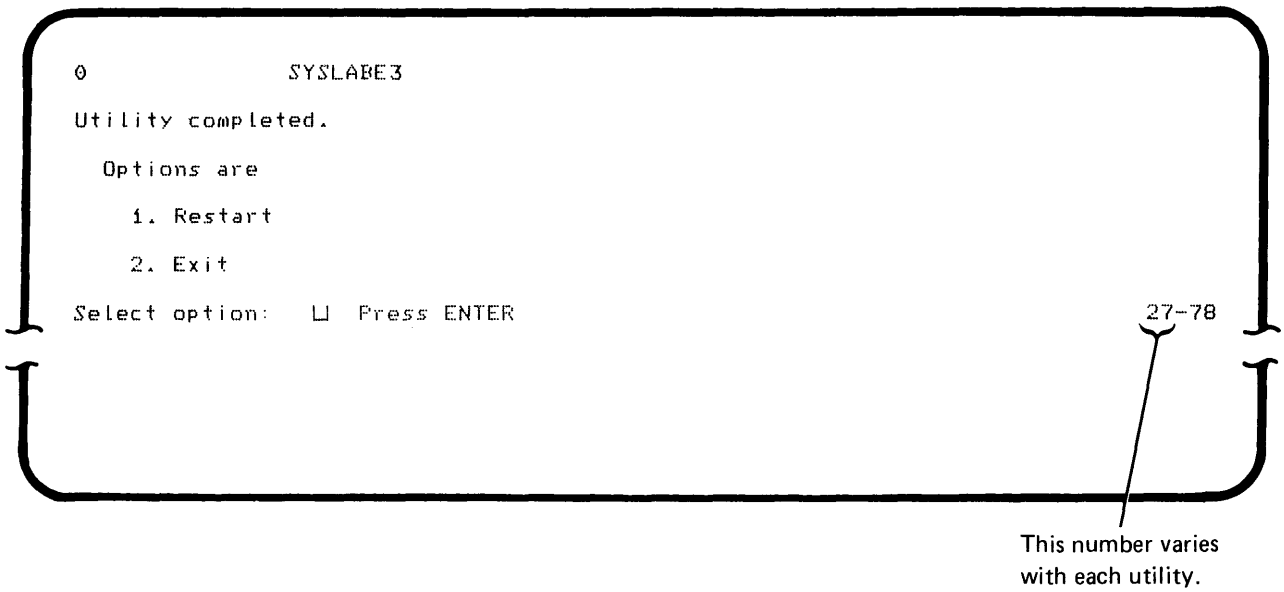
An input or output diskette may be protected against unauthorized use. (See Chapter 3 for information on how to protect volumes.) When you attempt to use a protected diskette volume, the volume-protected prompt is displayed. The following is an example of this prompt:



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

The Utility-Completed Prompt

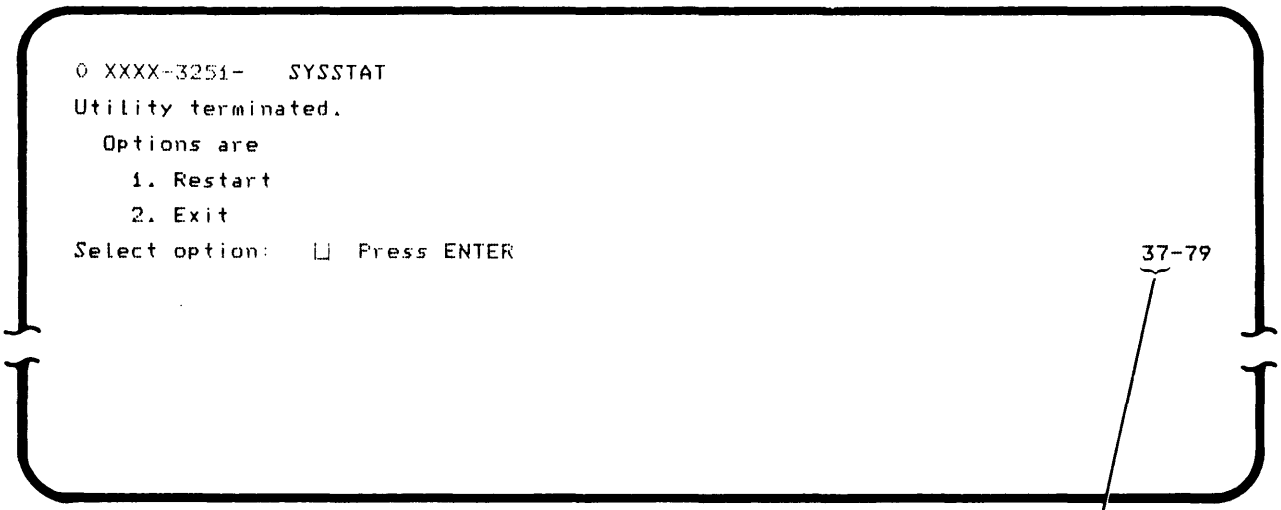
The status line shows the number of the partition in which the program was executed and the name of the utility program that was executed. (You might need this information because more than one program might have access to your keyboard.)



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:



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 DISKETTES

Diskette Types

The 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 5280 uses as replacements for defective cylinders when the diskette is initialized.

A 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 Chapter 8, *The Diskette Initialization Utility,* for more information about diskette formats.

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 Diskette Initialization Utility* 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.

HOW TO USE DATA SETS

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

Exchange Types

The 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 chararacters.

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.

Other Exchange Types

If you want to use the data in an existing data set, but the data set is not one of the three exchange types described above, 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 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 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 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 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 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 extend 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 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 diskette initialization utility to initialize a diskette that already contains data, all data sets are freed and new data sets must be allocated.

Chapter 2. The Key Entry Utility

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 data records already stored in 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* later in this chapter.

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 5280 system: job statistics and data station statistics. Job statistics are maintained by the 5280 system during the execution of a single data entry operation. Data station statistics are maintained by the 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 a 5280 system with at least an 8 K partition and common function option SYSCFA or SYSHELP.

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 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 and used 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.

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-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 the following subject heading.)

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 key 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 to 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 or the Field+ (Field Plus) key on the typewriter keyboard. If a verify-sign-mismatch error 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, it is displayed as the EBCDIC (extended binary-coded decimal interchange code) character that corresponds to one of the following digits.

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

KEYBOARD SHIFTS

The 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

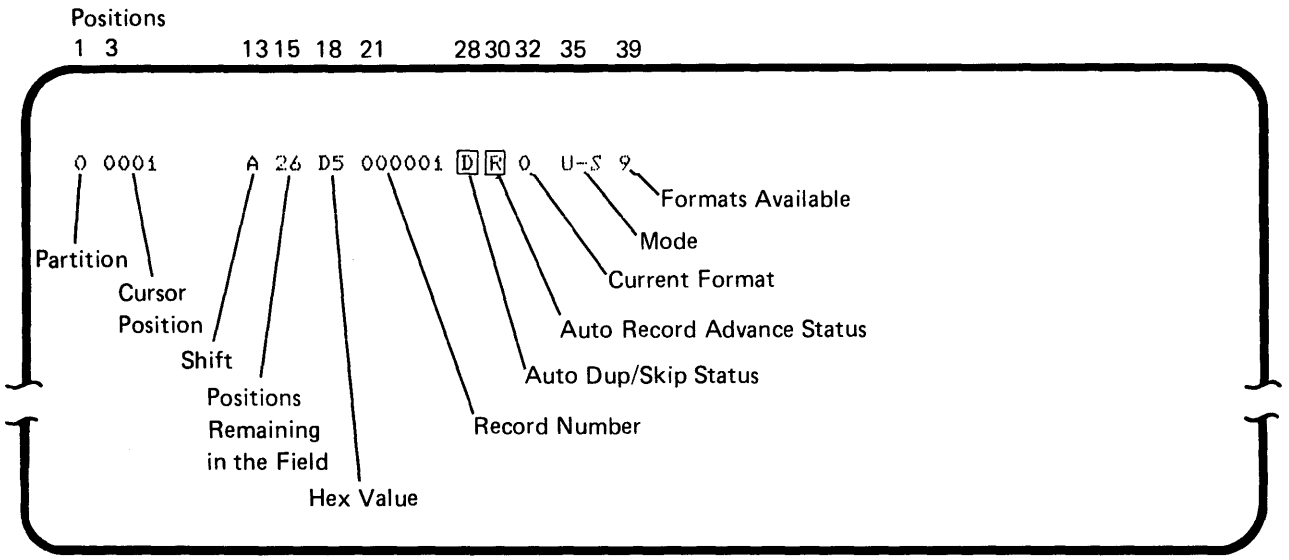
For data entry keyboards, numeric shift positions the keyboard to the upper symbol on each key. You can convert the keyboard to numeric shift when in an alphabetic shift field by pressing the Num (Numeric) shift key.

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 entry 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 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.
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.

Position(s)	Contents
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
35 through 37	The currently active mode:

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.

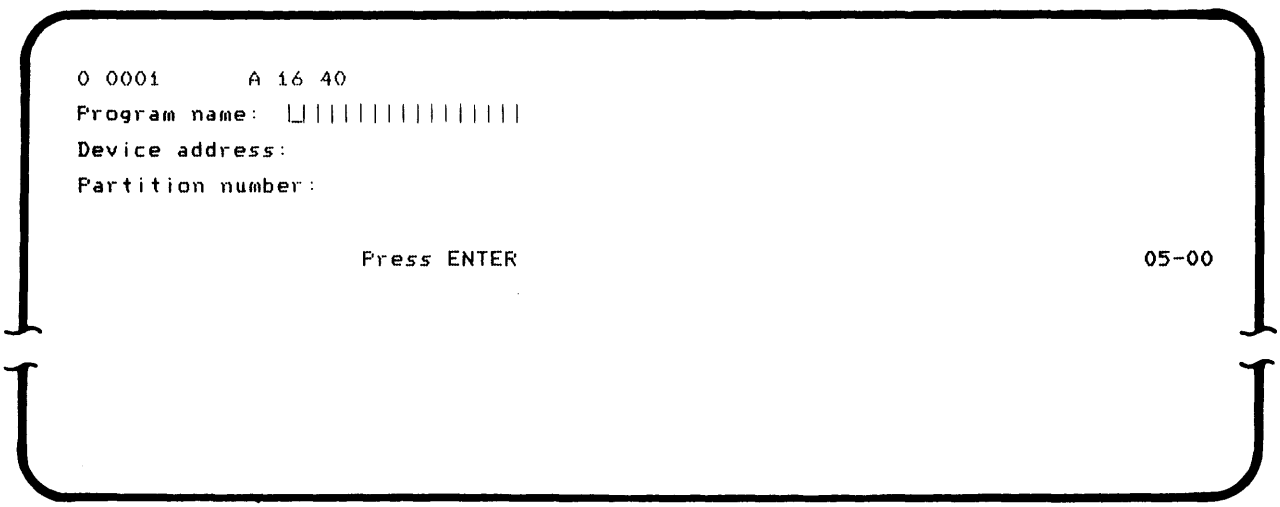
See the *Operator's Guide* for more information about the status line.

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:



1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYSKEU as the program name.
3. Enter the address of the diskette drive where the diskette is inserted.
4. Enter the number of the partition where the utility will execute.

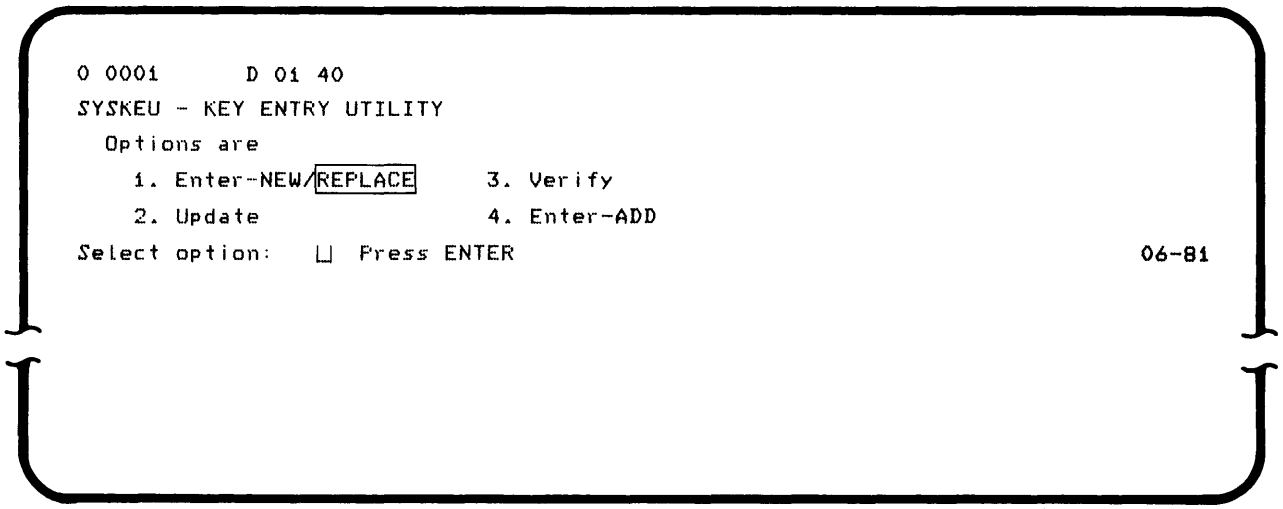
Note: It is necessary to specify a partition number only if you wish to load the key entry utility into a background partition.

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:



If you want to create a format at this time, see *Creating a Format*, later in this chapter. 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.

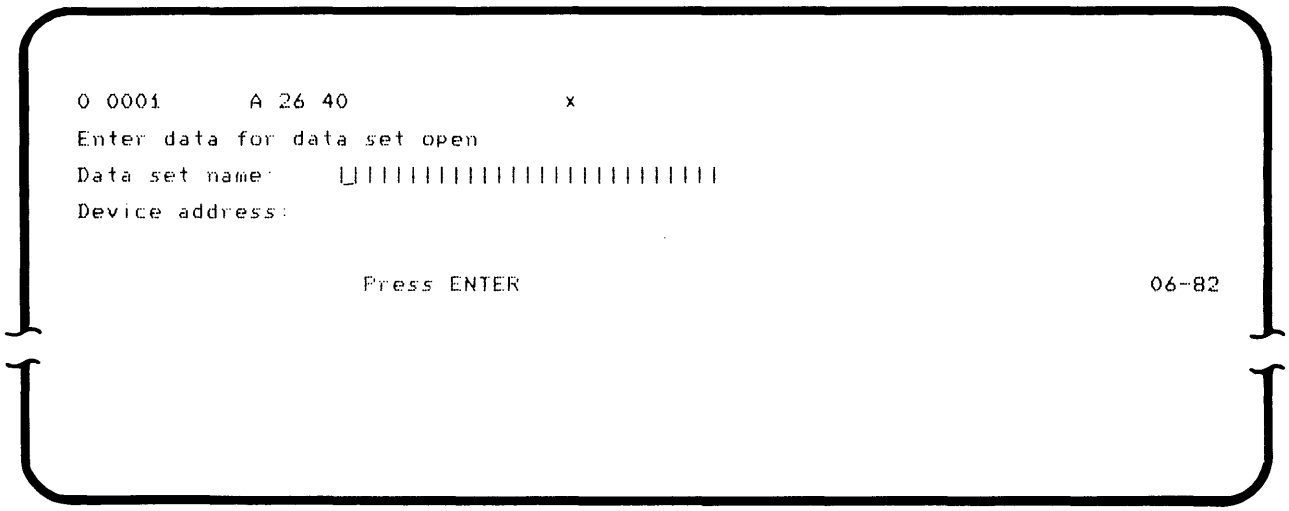
   Enter a 4 to add data at the end of previously entered data in a data set.

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* later in this chapter.)

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

Enter Data for Data Set Open (06-82)



1. Insert the diskette that contains the data set you wish to use into a diskette drive. The data set can contain formats (see *Formats* later in this chapter), or it can be the data set used for your data entry job to enter, update, or verify data.

2. Enter the name of the data set to be used.

3. Enter the device address of the diskette where you inserted the diskette.

4. Press the Enter key.

After you press the Enter key, the system opens the data set unless one of the following conditions occurs:

- The diskette is volume-protected; in this case the volume-protected prompt (05-01) is displayed.

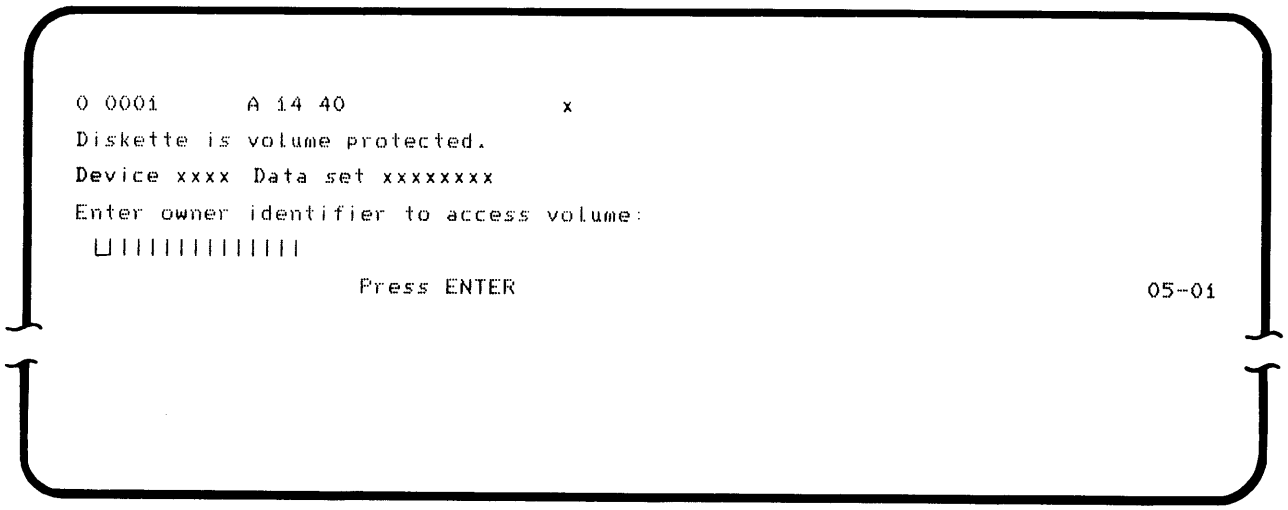
- The data set is not allocated on the diskette and you selected the enter-NEW/REPLACE mode from the primary mode menu; in this case the data set open failed prompt (06-83) is displayed.

- An error occurs; in this case an error code is displayed in the status line and the status line blinks. See the *Message Manual* for recovery procedure for the error code.

When the data set is successfully opened, the system positions the data set to the first record (or to the next available record if you selected enter-ADD mode). You can begin the data entry operation. (See *Data Entry Operation* later in this chapter.)

Diskette is Volume-Protected (05-01)

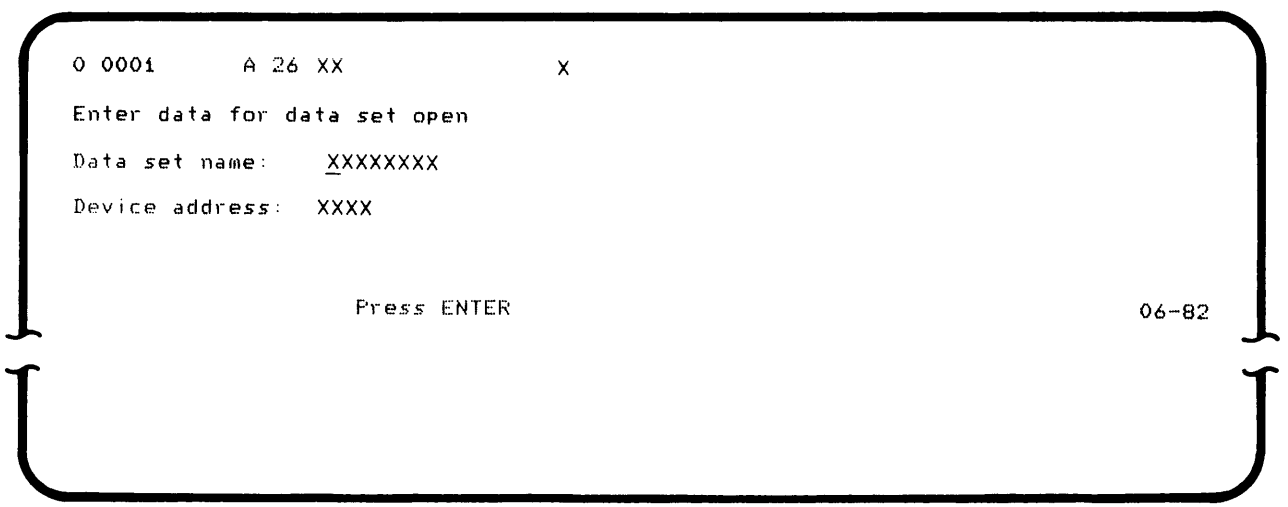
If the diskette is volume-protected, the following prompt is displayed:



1. Enter the matching owner identifier for the diskette. (Otherwise, access to the diskette is prohibited.)

2. Press the Enter key.

The data set open prompt is redisplayed with the information you entered previously.



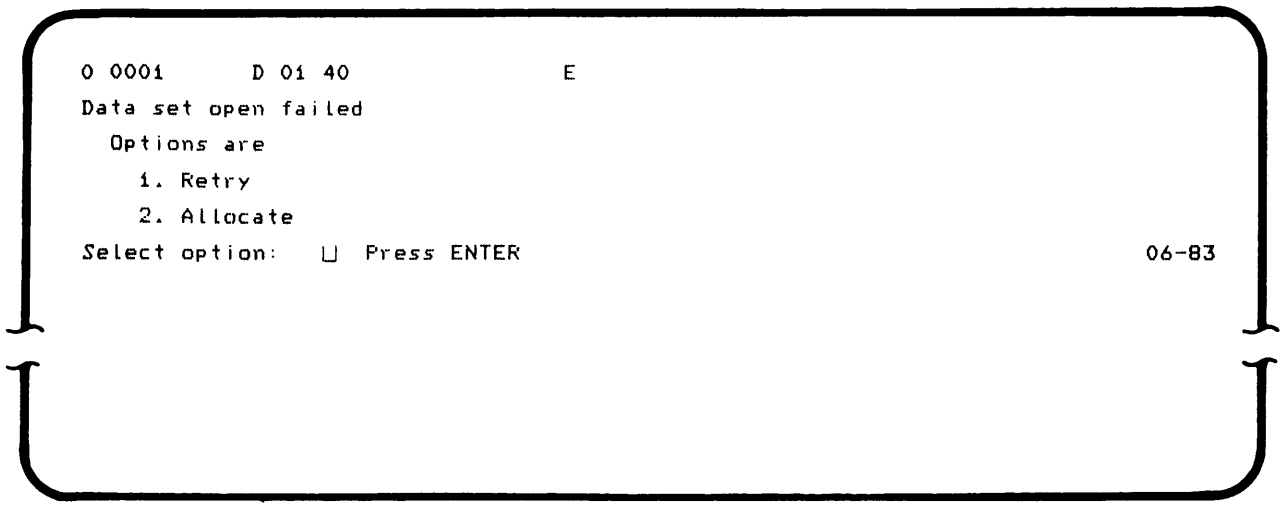
Press the Enter key.

If you entered the correct owner ID, the data set is opened. If you did not enter the correct owner ID, the volume-protected prompt is redisplayed.

If you successfully open the data set, you can start the data entry operation. (See *Data Entry Operation* later in this chapter.)

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:



1. Select an option:

   Enter a 1 to retry the open.

   Enter a 2 to allocate space for the data set.

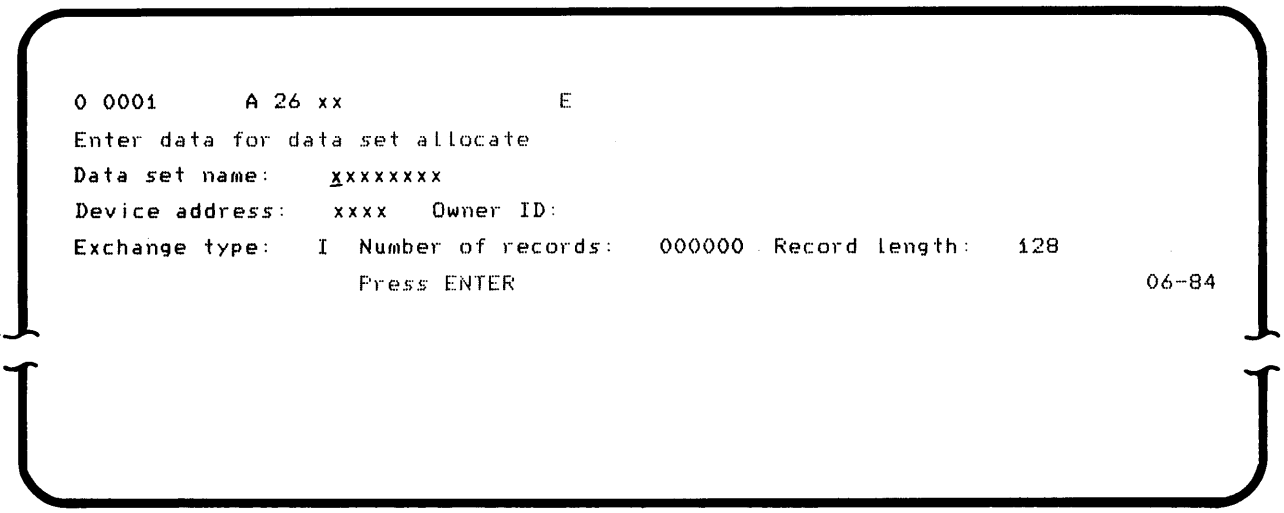
2. Press the Enter key.

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:



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)

3. The default exchange type (I exchange)

4. The default value for the number of records (000000)

Note: If the number of records value is zero, all the remaining space on the diskette will be allocated to this data set.

5. The default value for record 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, a H exchange data set is allocated. (See Chapter 1 for more information about exchange types.)

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

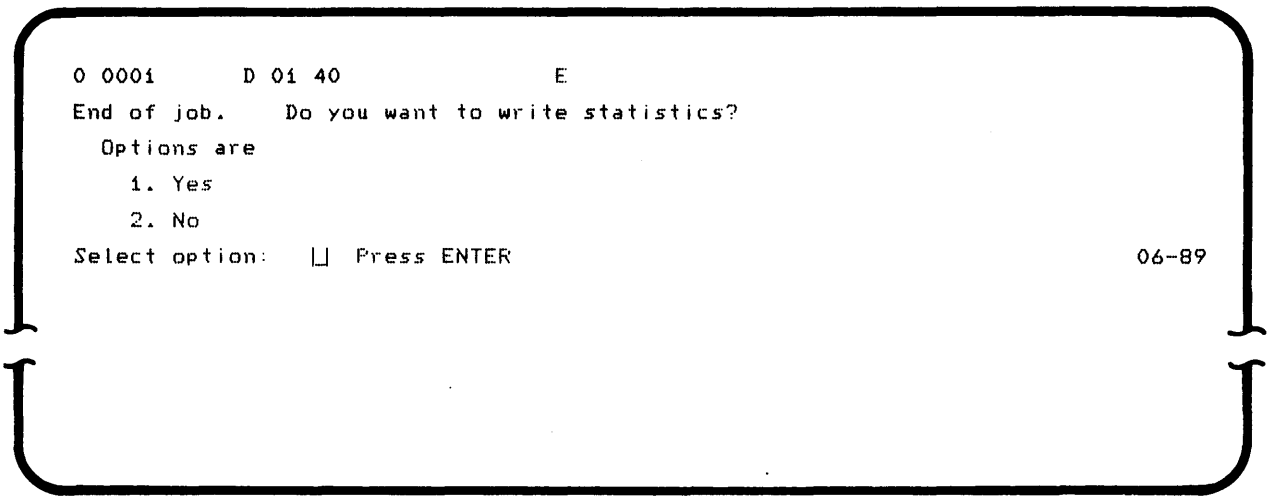
After your data set is successfully opened, the system positions the data set to a record. If you selected enter-ADD mode, the record is the next available record (that has not had data previously entered) in the data set. If you selected enter-NEW/REPLACE, verify, or update mode from the primary mode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

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 open[1], the following prompt is displayed:



1. Select an option.

2. Press the Enter key.

If you select option 1, the data set open prompt (06-82) is displayed. 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.

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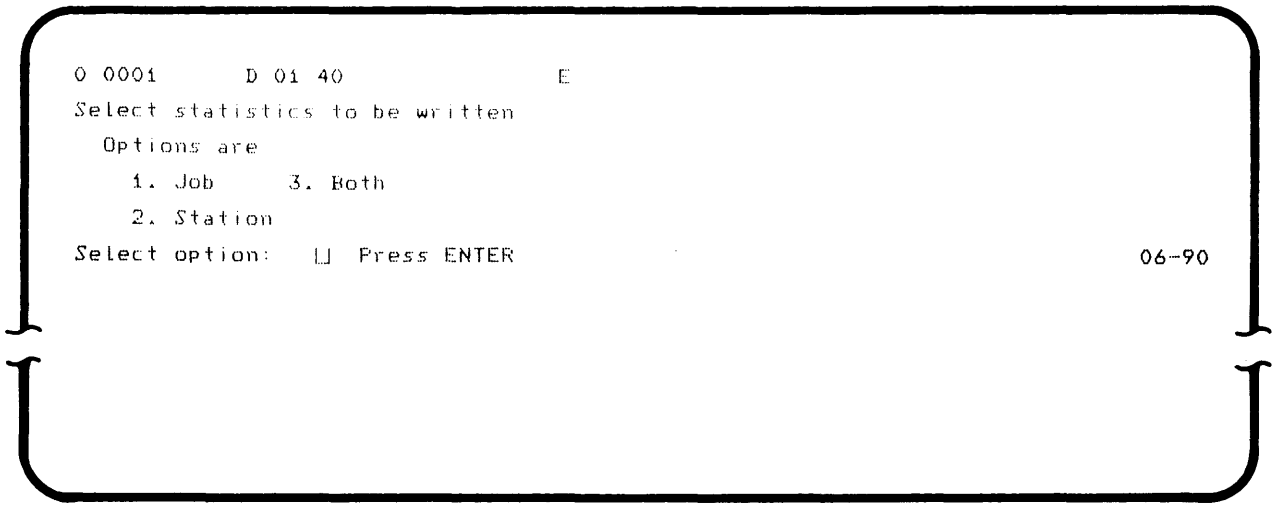
[1]If the data set is not open when you use the Cmd, End of Job key sequence, and if the primary mode menu is not being displayed, the system displays the primary mode menu.

Select Statistics (06-90)

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



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* later in this chapter.

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* later in this chapter.) 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 the next field is displayed.

Using the key entry utility, you can:

- Create formats
- Load formats into the 5280 as they are created
- Save formats on a diskette (except format 0)
- Load formats into the 5280 from a diskette
- Display formats
- Change formats (except format 0)
- Chain one 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 8 K bytes. For an I exchange data set, use the following chart to determine the maximum number of formats you can use.

Sector Size	Sector Size ÷ Record Length		Partition Sizes				
	Zero Remainder[1]	Nonzero Remainder[2]	8 K	9 K	10 K	11 K	12 K
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	–	5	9	9	9
1024	X		–	5	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 8 K 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 5 formats are available for use in an 8 K partition.

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

[1]The sector size divided by the record length with a zero remainder.
[2]The 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 later in this chapter under *How to Define a Prompting Format* and *How to Define a Record Format*.

To create a format when the primary mode menu is displayed, follow these steps rather then 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 the 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 5280.

5. Press the Cmd key, then the End of Job key. The primary mode menu (06-81) is displayed.

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 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, press the Cmd key, hold down the shift key, then press the Display Data key to redisplay the record.

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 a diskette. 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.

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

1. 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 at 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.*)

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.

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 5280 system, do the following:

1. 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 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 clears the screen.

6. Repeat steps 4 and 5 to load more than one format into the 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 your 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 currect 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.

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 under *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.

To change a format, do the following:

1. If the format is not currently active, select the format using the procedure under *Selecting a Format.*

   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. Pressing 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. Press the Cmd key, hold down the shift key, then press the Display Data key to display the original data record.

6. To use the format that has been changed, select it by pressing 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.

Record Format Codes

The following chart lists the record format codes and their meanings:

	Format Codes	Keyboard Shift[2]	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 *Keyboard Shifts* earlier in this chapter.

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 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 a diskette.

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.

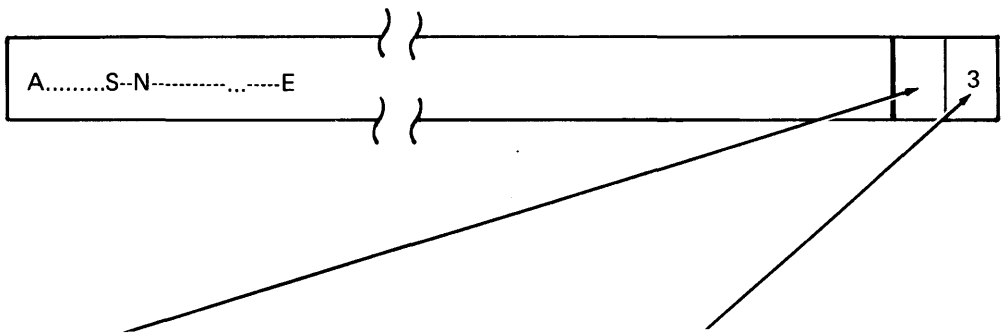
Any valid format number 0 through 9 can be placed into position 127 or 128 of the format.

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 Example

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

Format 1

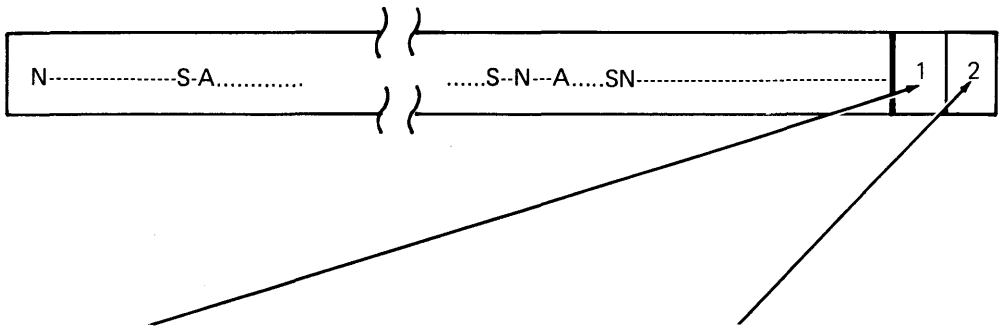


Position 127 contains no chaining character; therefore, when you perform a record backspace with the Home key, format 1 will continue to control the data record.

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

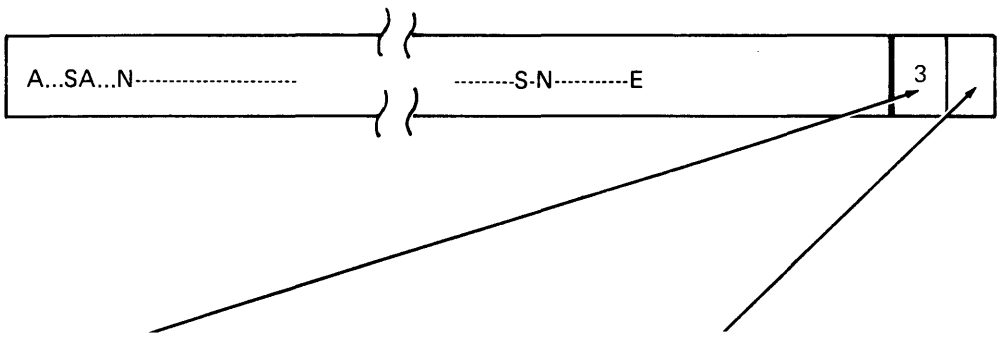


The 1 is in position 127. If a record backspace occurs with the Home key, format 1 will control the data record to which you are backspacing.

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:

1. Press the Cmd key, then the Hex key.

2. 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.

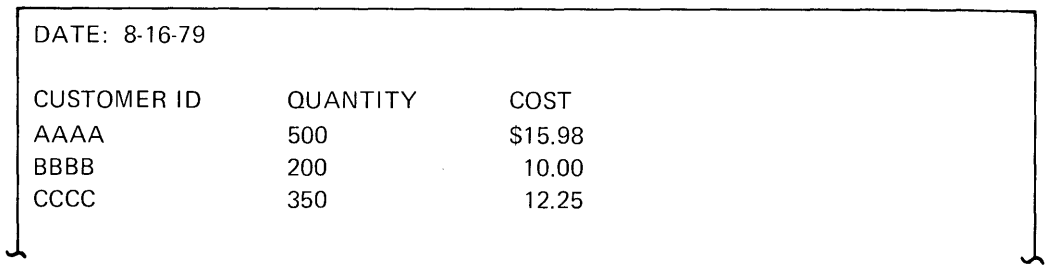
The hex 28 controls the display of the CUSTOMER IDENTIFICATION prompting message. When the prompting message is displayed, it will blink.

The hex 23 controls the display of the QUANTITY prompting message. The message will be displayed with high intensity and the image will be reversed.

Format Example

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

Source Document



DATE: 8-16-79

CUSTOMER ID	QUANTITY	COST
AAAA	500	$15.98
BBBB	200	10.00
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 in the verify correction keystrokes counter.

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*, in the Operation section of this chapter.

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 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.

[1]Always 0 for the key entry utility, except that station statistics may have a value.
[2]Always 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 keystroke 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 Diskette Label Maintenance Utility

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

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 is used to establish space for a new data set on a diskette. The data set space is allocated following the last previously allocated data set on the diskette. 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 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 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 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 5280 system in response to the volume-protected prompt, to access a volume-protected diskette. It is a user-defined name of up to 14 alphameric characters.

See the *Volume-Protected Prompt* in Chapter 1 for more information.

Volume-Protect (Accessibility) Field

The volume-protect (accessibility) field restricts access to data on a diskette if any nonblank character appears in this field. Volume protection should not be used unless you want to prevent others from using the diskette. A protected volume cannot be accessed unless the owner identifier is known.

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

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 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 alphameric 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 diskette volume. A blank in this field indicates that a data set is contained wholly on this diskette. The character C in this field indicates that a data set is continued on another diskette. An L indicates that this is the last of two or more diskettes 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 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.

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.

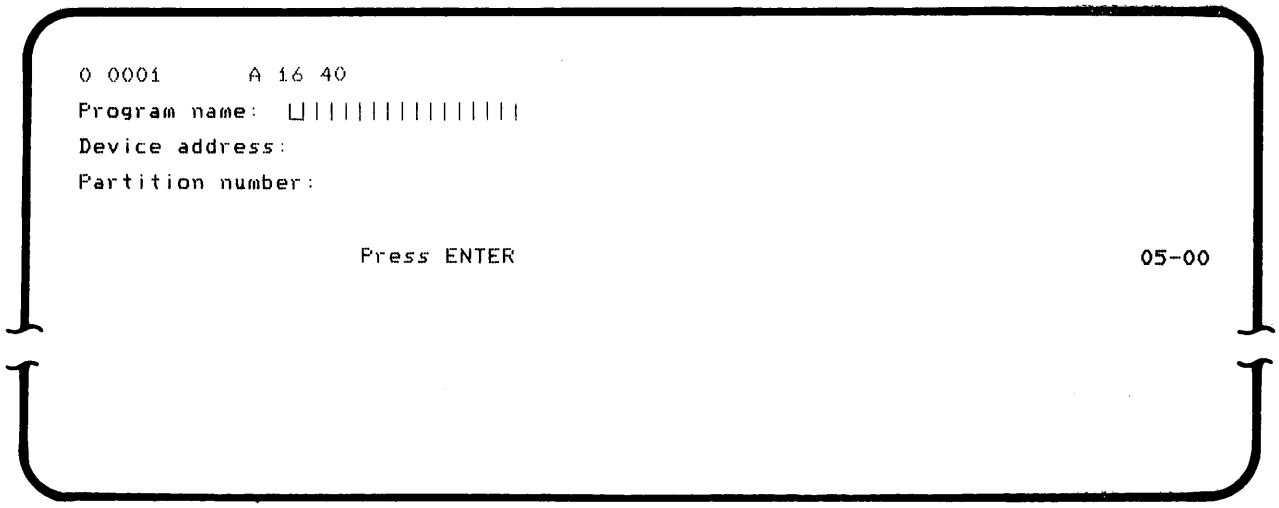
Because the 5280 places the delete character in the last data position in a record, select a delete character that is so unique as to never appear in the last position of a valid record. Otherwise, a valid record may be unintentionally deleted.

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.

Operation of the Label Maintenance Utility

Load the Utility (05-00)

To load the utility, respond to the following prompt:



1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYSLABEL as the program name.
3. Enter the device address of the diskette drive where the utility is inserted.
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:

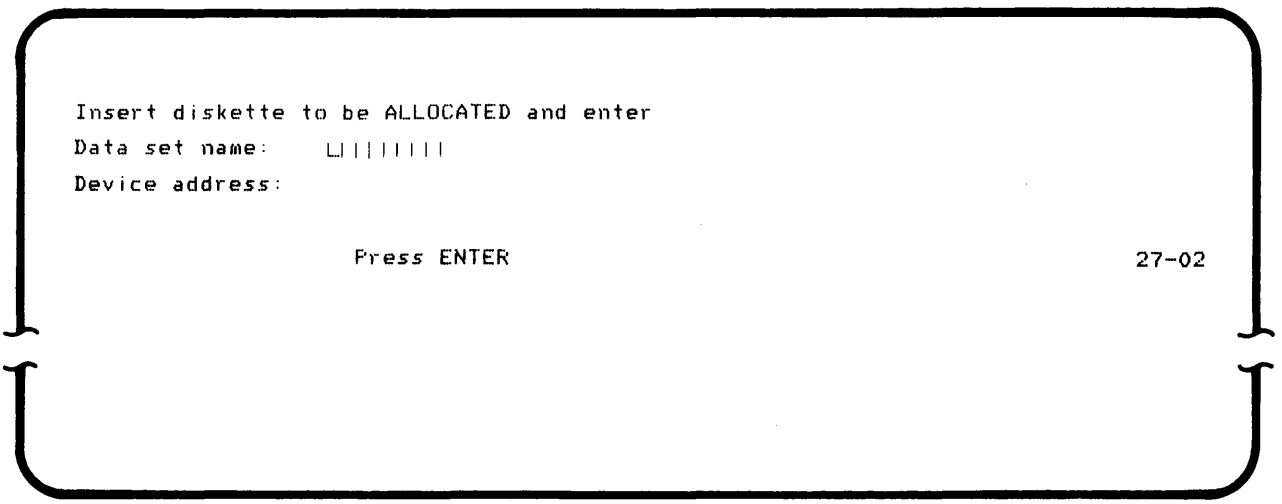
```
SYSLABEL - LABEL CREATE/MAINTENANCE UTILITY

  Options are

    1. Allocate        3. Modify volume label

    2. Delete          4. Modify data set label

Select option:  ␣ 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)

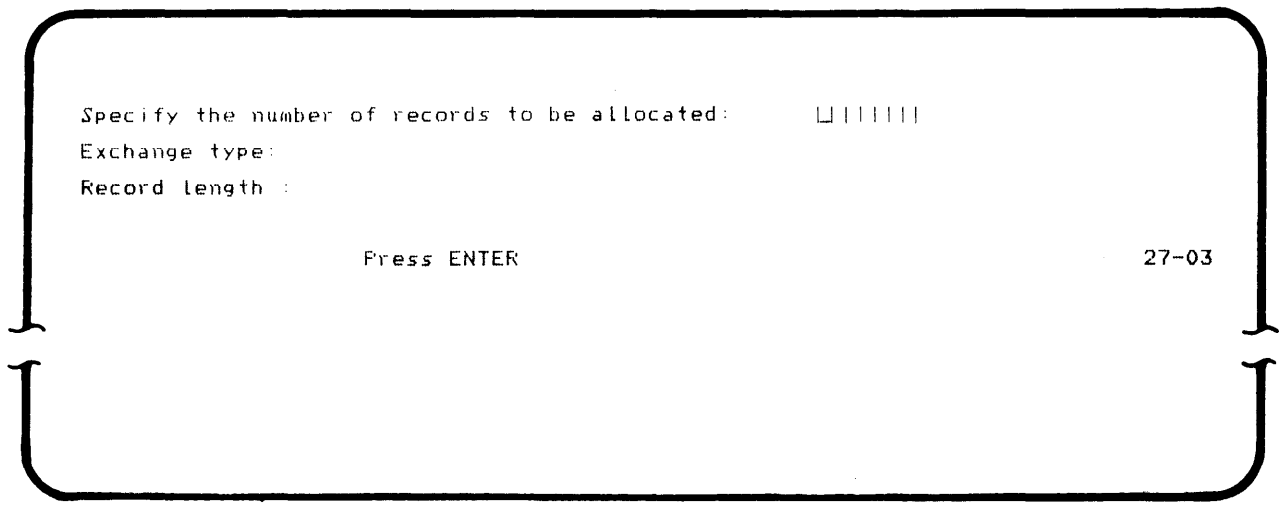
If option 1 is selected in the label maintenance option prompt (27-01), the following prompt is displayed:



Insert the diskette with the space to be allocated. Then enter the name of the data set to be allocated and the diskette 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:



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, all remaining space on the diskette will be allocated to this data set.

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.

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

basic	≤ 128
H	≤ 256
I	≤ 1024

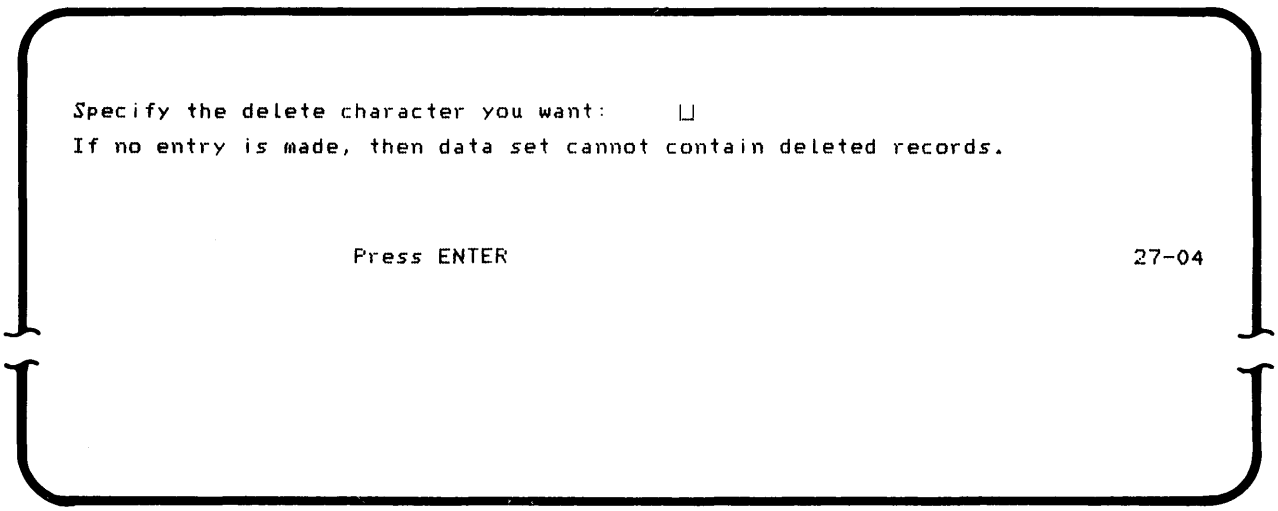
4. Press the Enter key.

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. The 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:



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

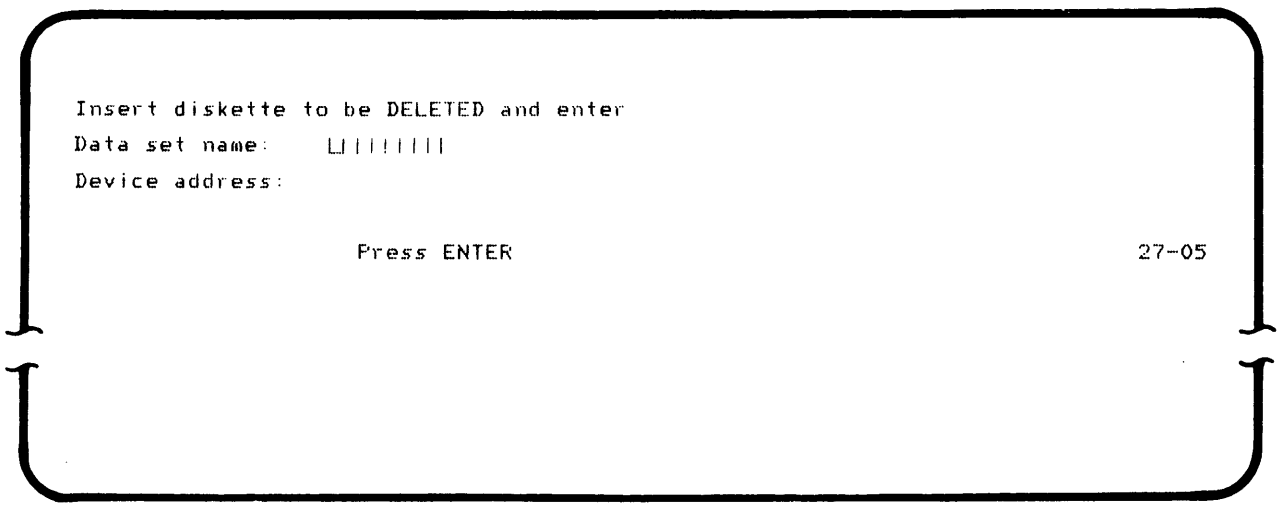
Specify the delete character. (This should be a character that will never appear in the last position of a valid record.) The delete character may be one of these: A through Z, 0 through 9, or . & $ * ; - , % # and @. Press the Enter key.

If the diskette 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, and the record length specified. The utility-completed prompt (27-78) is then displayed.

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:



Note: The label maintenance utility cannot clear the data portion of the diskette to hex 00, whereas the clear utility can with the data set free option.

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

If the diskette is volume-protected, the volume-protected prompt is displayed. Enter the matching owner ID 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:

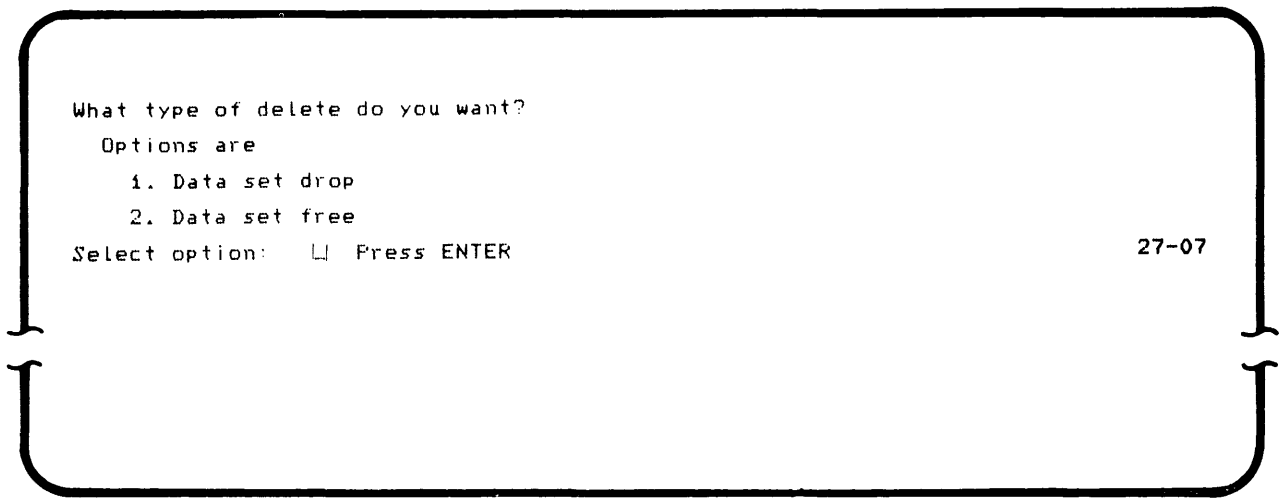
```
Data set is unexpired.
Do you want data set deleted?
  Options are
    1. Yes          2. No
Select option:      Press ENTER                                   27-12
```

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:



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.

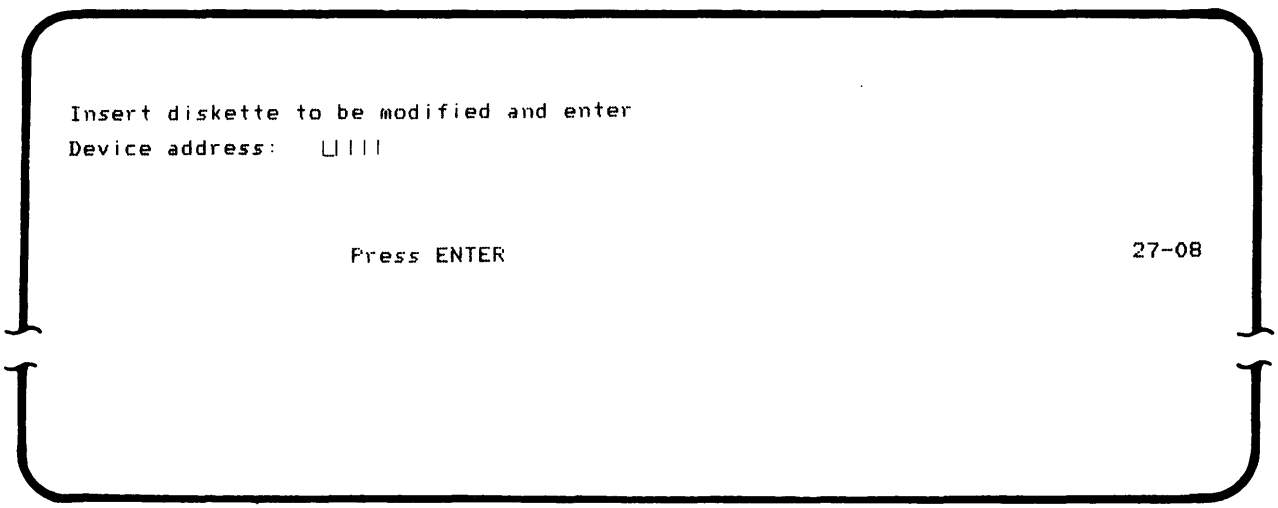
Data set free deletes both the data and the label. The data remains in place physically but is inaccessible because the labels are deleted. All reference to the data is removed as though it never existed.

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:



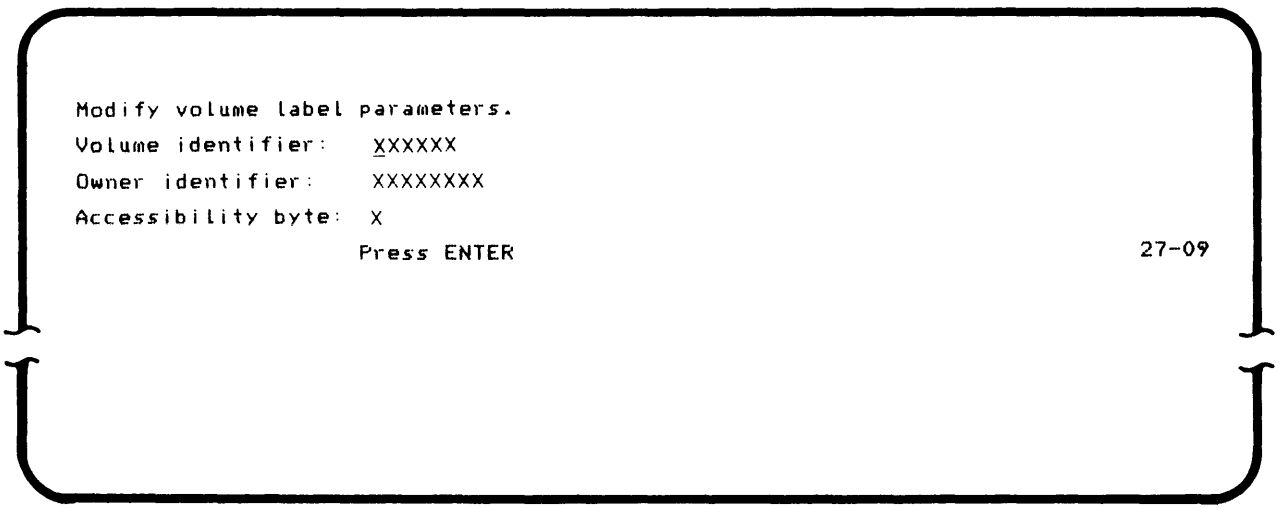
Insert the diskette containing the volume label to be modified. Enter the diskette device address, and press the Enter key.

If the diskette is volume-protected, the volume-protected prompt 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, the following prompt is displayed:



Note: A byte represents a character.

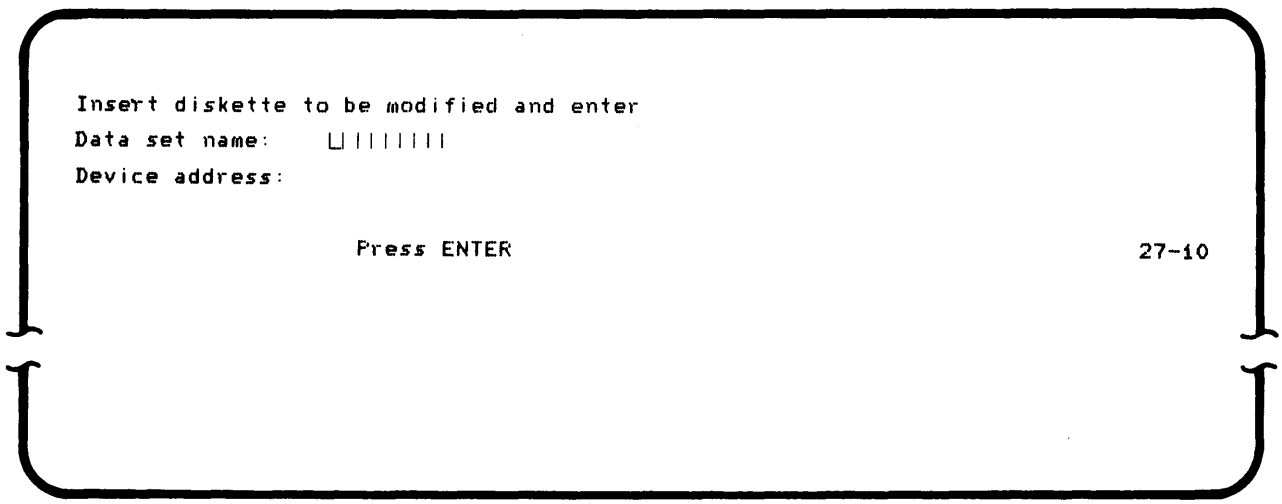
The display shows the current contents of these fields in the volume label. You can change any field or leave any field as it is. Use the → (Cursor Right) and ← (Cursor Left) keys, the |← (Field Advance) key, or one of the field exit keys to position the cursor at any field(s) to be changed.

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:



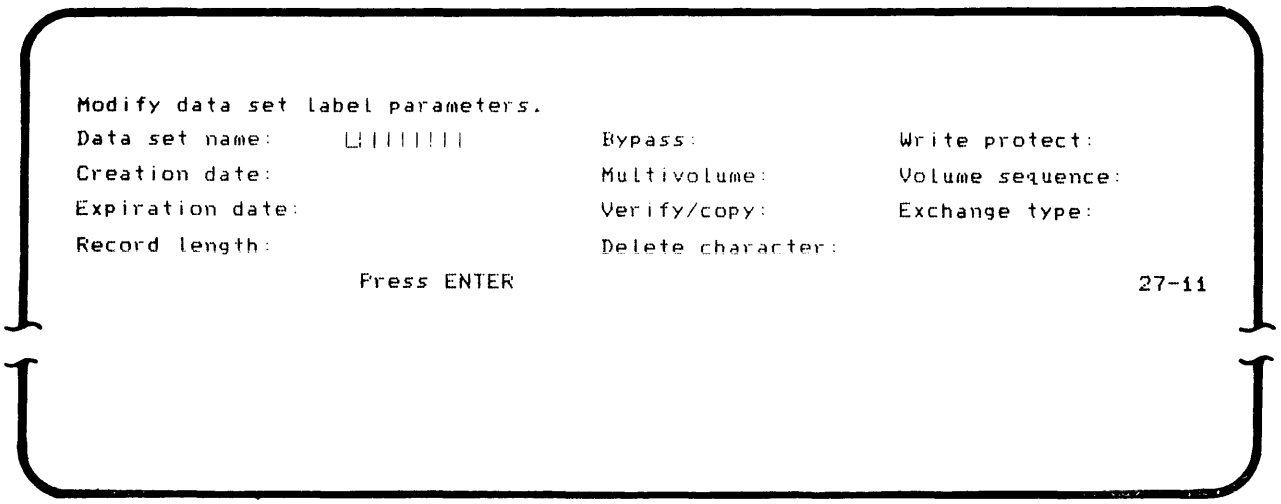
Insert the diskette with the data set label to be modified into a diskette drive. Enter the name of the data set and the device address, and press the Enter key.

If the diskette is volume-protected, the volume-protected prompt 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:



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 → (Cursor Right) and ← (Cursor Left) 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 alphameric
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
Delete character	A through Z, 0 through 9, . & $ * - ;, % # @

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. This will eliminate the defective sectors.

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 Diskette Label List Utility

The label list utility displays or prints listings of 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 diskette format number)

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

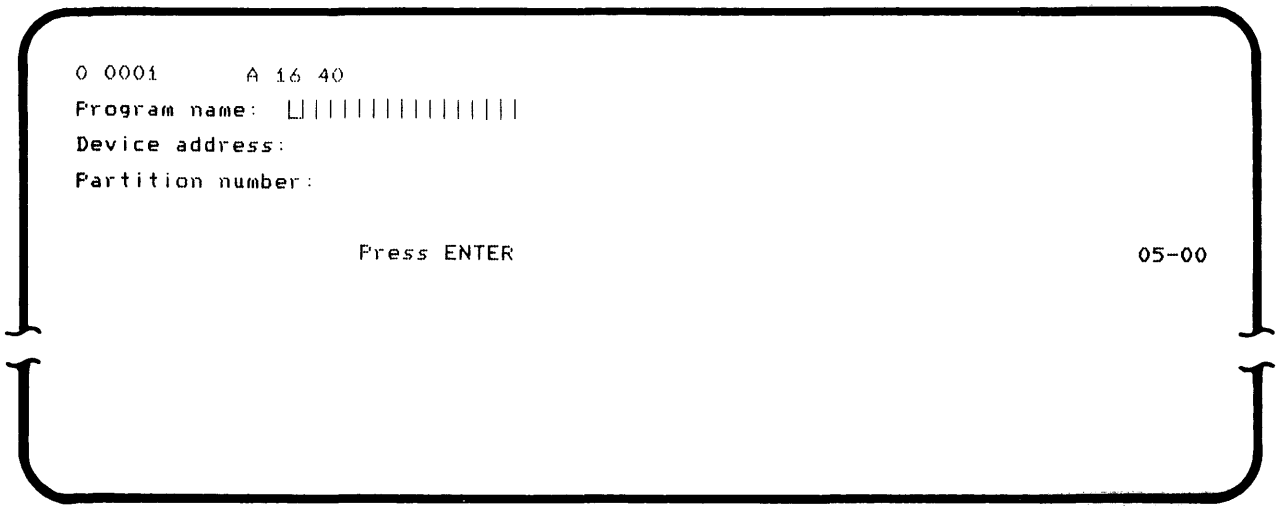
Labels on any volume-protected diskette can be displayed or printed only if the owner identifier is entered. The owner identifier is a user-defined name that is given to the diskette. (See the *Volume-Protected Prompt* in Chapter 1.)

If you list to the printer, all the labels on a diskette can be printed without operator intervention. You can, however, intervene and stop the printing 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.

Operation of the Label List Utility

Load the Label List Utility (05-00)

To load the utility, respond to the following prompt:

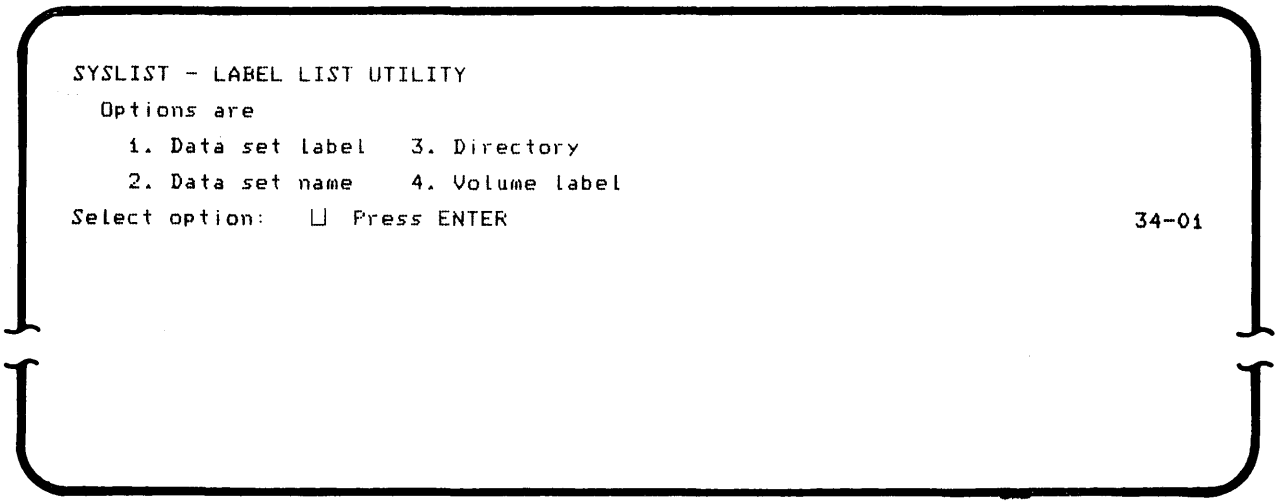


1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYSLIST as the program name.
3. Enter the device address of the diskette drive where the utility diskette is inserted.
4. Enter the number of the partition where the program will execute. (If a partition number is not entered, 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:



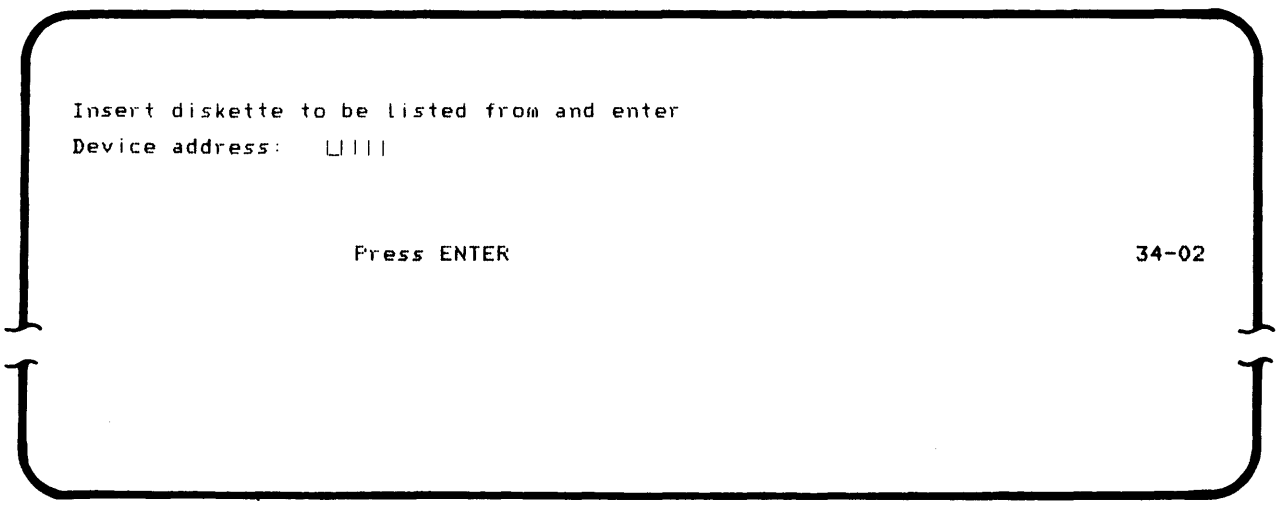
1. Select an option:
   - Enter a 1 to display or print the data set labels on a diskette.
   - Enter a 2 to display or print all the data set names on a diskette.
   - Enter a 3 to display or print a listing of the label directory.
   - Enter a 4 to display or print a volume label and format number.
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 the diskette to be listed from into a diskette drive. Enter the device address and press the Enter key.

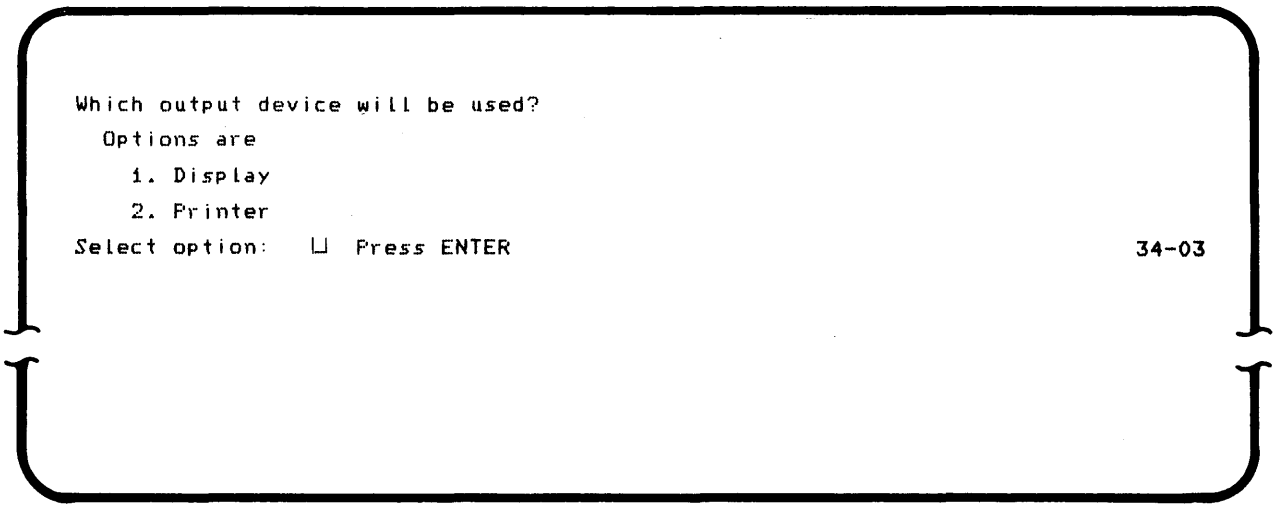
If the diskette to be listed from is volume-protected, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key.

If your system has a printer installed, the specify output device prompt (34-03) is displayed. Otherwise, the list of labels (34-07) is displayed.

If the diskette has no data set labels to be listed, an error occurs. After you press the Reset key, the insert diskette prompt (34-02) is redisplayed.

Specify the Output Device (34-03)

The following prompt is displayed if your system has a printer installed:



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.

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

The system displays only as many labels, data set names, or directory 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 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)

```
Remaining diskette space (K-bytes)        0124
Diskette format                              2

Press ENTER to continue                                    34-08
```

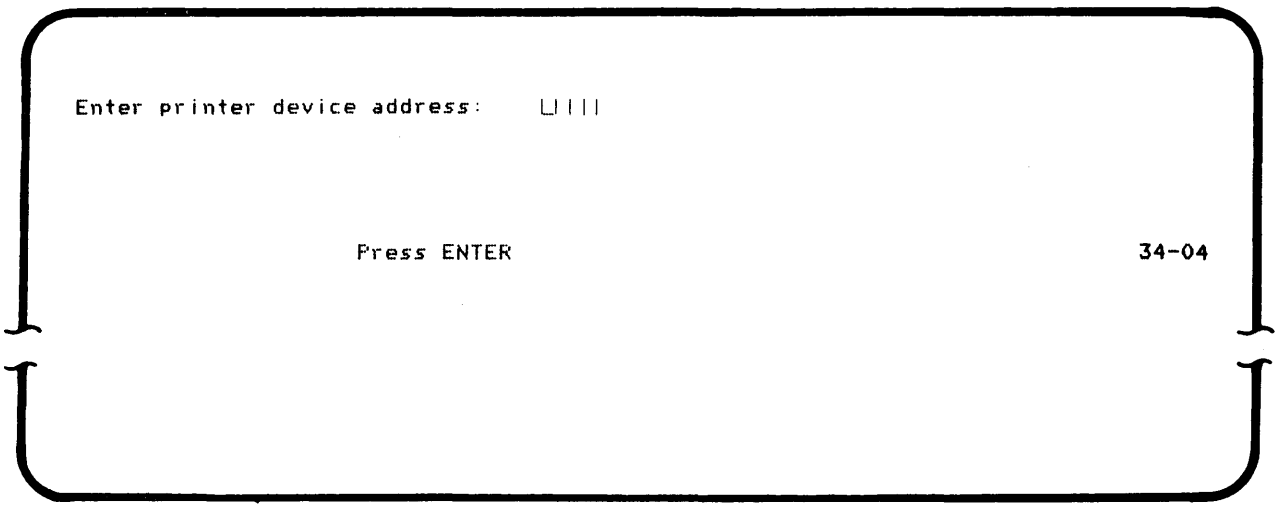
The first line of the prompt shows the total number of K bytes remaining to be used on the diskette. These bytes follow the last end-of-extent value (K = 1024).

The second line of the prompt shows the format number of the diskette. (See *Diskette Format* in Chapter 1.)

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:



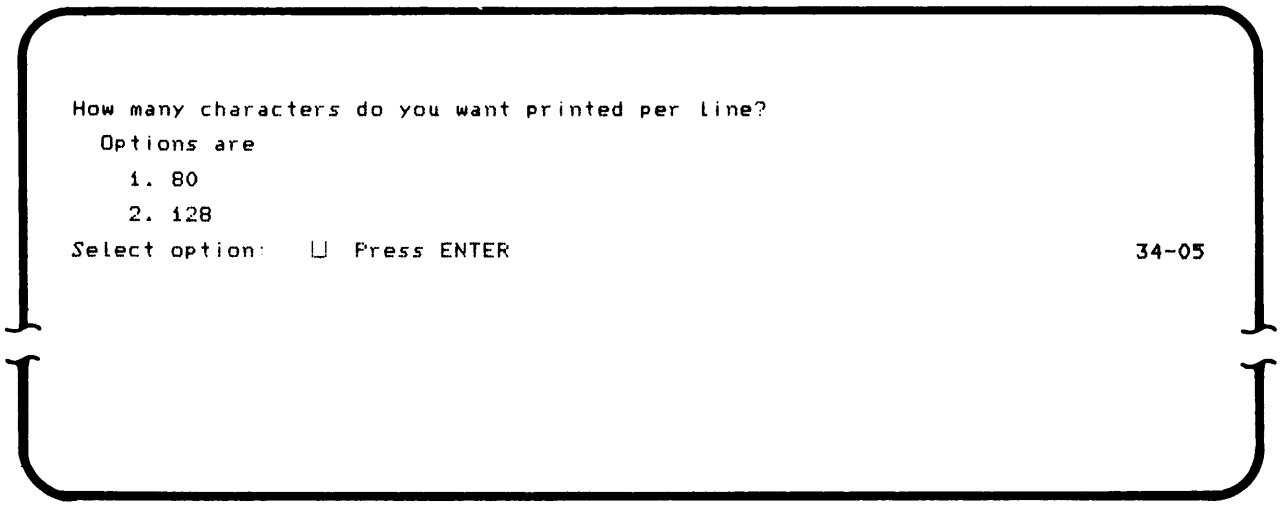
Enter the printer device address and press the Enter key.

If you are printing a list of the volume labels or the data set labels, the line length prompt (34-05) is displayed.

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.

Specify the Number of Characters to be Printed Per Line (34-05)

If you are printing a complete set of volume labels or data set labels, the following prompt is displayed:



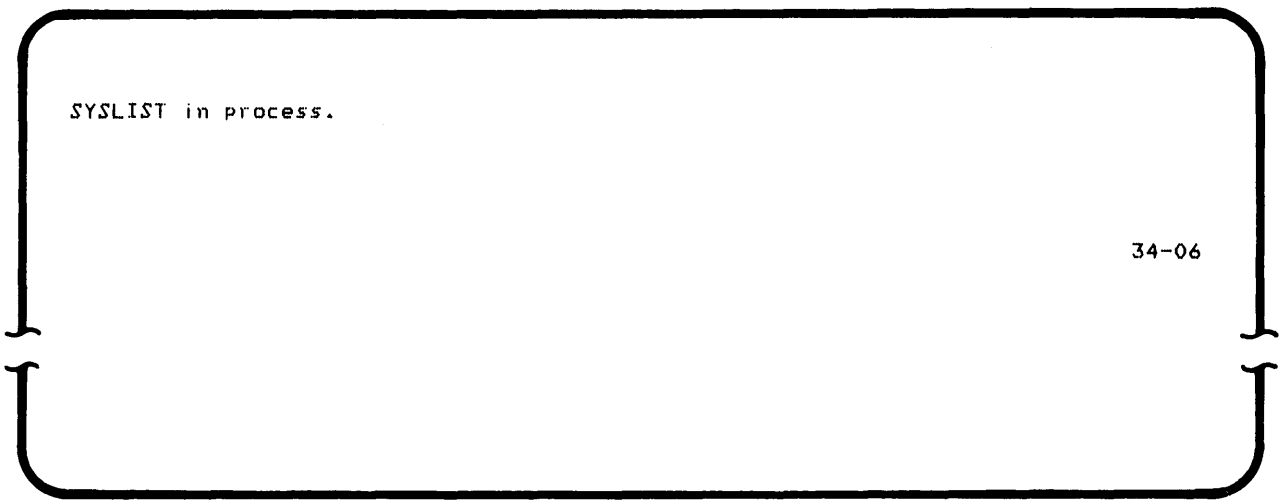
1. Select an option:
   - Enter a 1 to print 80 characters per line.
   - Enter a 2 to print 128 characters per line.
2. Press the Enter key.

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 system begins printing the listing and displays the listing in process prompt (34-06).

Listing in Process (34-06)

The following prompt is displayed while the listing is being printed:



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

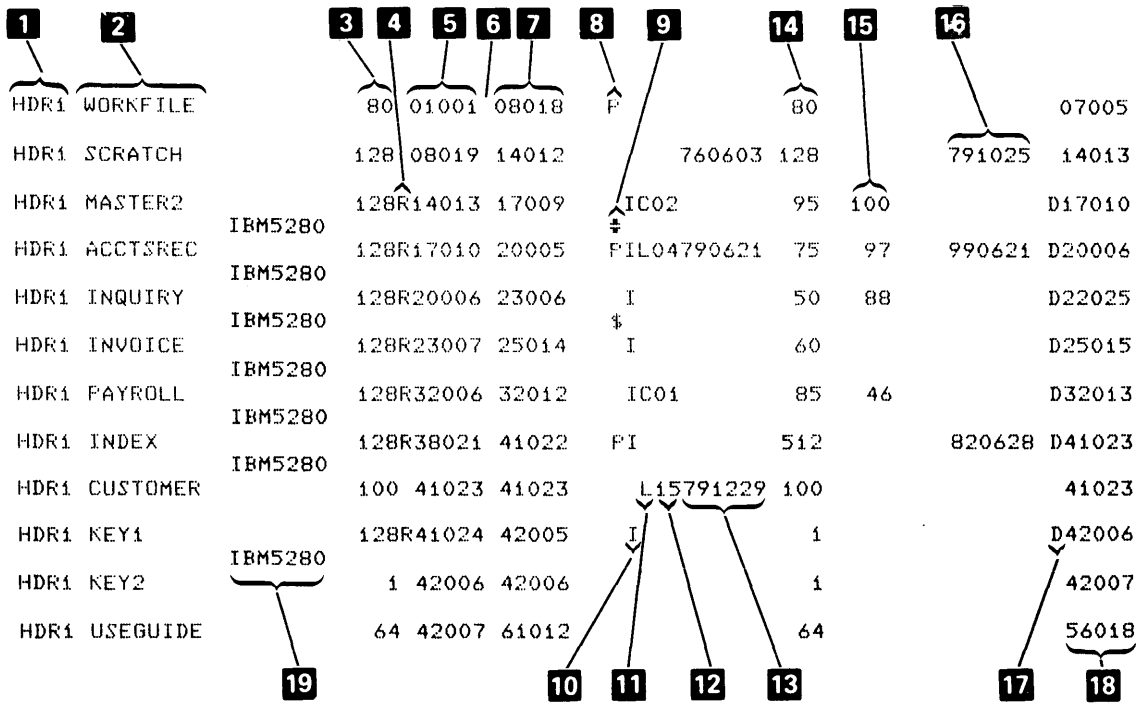
Utility Completed (34-78)

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 (3401) is redisplayed.

Label Listing Examples

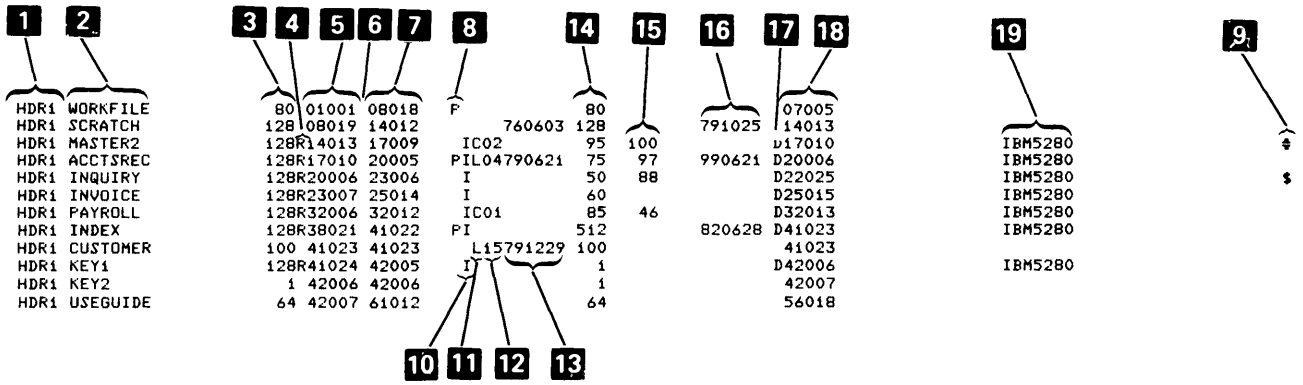
The following examples show the more commonly used fields of the labels. See the *Diskette General Information Manual* for more information about diskette labels.

Data Set Label Listing with 80-Character Lines



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

Data Set Label Listing with 128-Character Lines



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

Data Set Name(s) Listing

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

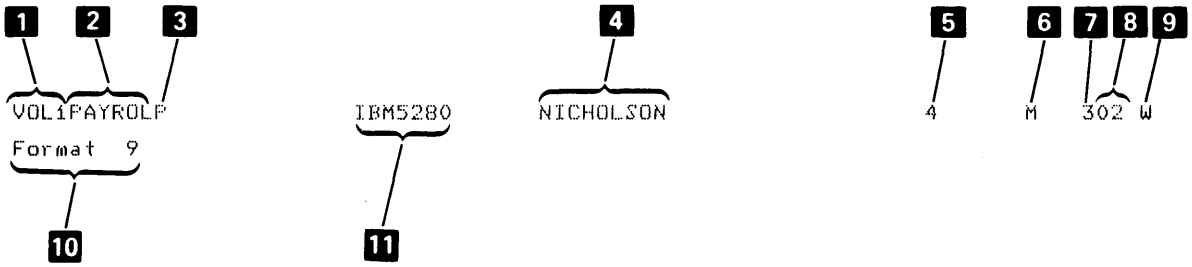
Directory Listing

1 DATA SET NAME	2 EX	3 BOE	4 EOD	5 EOE	6 WP	7 RECL	8 #REC	9 UNUSED
WORKFILE		01001	07005	08018	P	80	200	40
SCRATCH		08019	14013	14012		128	150	0
MASTER2	I	14013	17010	17009		95	101	1
ACCTSREC	I	17010	20006	20005	P	75	126	1
INQUIRY	I	20006	22025	23006		50	202	22
INVOICE	I	23007	25015	25014		60	128	0
PAYROLL	I	32006	32013	32012		85	10	0
INDEX	I	38021	41023	41022	P	512	20	0
CUSTOMER		41023	41023	41023		100	1	1
KEY1	I	41024	42006	42005		1	1024	0
KEY2		42006	42007	42006		1	1	0
USEGUIDE		42007	56018	61012		64	500	125

Remaining diskette space (K-Bytes) 0044
Diskette format 1

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

Volume Label Listing with 128-Character Lines



1. Label identifier
2. Volume identifier
3. Volume protected indicator
4. Owner identifier
5. Extended label cylinders
6. Diskette type indicator (M=2D)
7. Sector size indicator
8. Sector sequence number
9. Label standard version
10. Format
11. System identifier

Chapter 5. The Diskette Copy Utility

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

- Image copy: The entire contents of a single diskette are copied to another diskette of the same type and initialization.

- Volume copy: The entire contents of a diskette are copied to another diskette of the same or different type and initialization. You can copy to an empty diskette, you can add data sets to existing data sets on a diskette, or you can copy over existing data sets on a diskette.

- 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* in Chapter 1.

Note: If you copy an IPL diskette, use the image copy option. You can also use the volume copy option if the output diskette is empty or if you *copy over* existing data sets.

The following chart provides a summary of the copy options and their functions.

	Number of Drives Required	Type of Input/ Output Diskette	Input/ Output Data Set can reside on Same Diskette	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	All data sets	No	Yes	NA	Yes
Volume copy	2	S/D	NA	All data sets	Yes	Yes	Yes	Yes
Data set copy	1 or 2[1]	S/D	Optional	1 to 4 data sets[2]	Optional	Yes	Yes	Optional
Specify record copy	1 or 2	S/D	Optional	Part of a data set	Yes	Yes	Yes	Optional
Specify key copy	1 or 2	S/D	Optional	Part of a data set	Yes	Yes	Yes	NA
Single drive data set copy	1	S/D	Optional	Single data set	Yes	No	No	No

S = same diskette type.
S/D = the same or different diskette type.
NA = not applicable.

[1]You can use up to 5 drives.
[2]Provides multivolume input support.

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 9 K 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 12 K 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).

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 that requires more storage than is currently available on a single output diskette or data set. For example, you can copy data from a diskette 2 or 2D to several diskette 1's. Any additional output diskettes 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. Any additional output diskettes used for a volume copy must have the same sector size and initialization as the first output diskette.

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.

IMAGE COPY

Image copy copies all labels and data tracks 1 through 74 on one diskette to another diskette 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 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 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 insert another output diskette.

VOLUME COPY

Volume copy copies the entire contents of one diskette to another of the same or different format. For example, you can copy the entire contents of a diskette 2 or 2D to several type 1 diskettes. All records, including deleted records, are copied. Unlike image copy, volume copy does not copy defective sectors (areas where data cannot be written).

The input and output diskettes for volume copy can have different diskette types, sector sizes, interchange codes, sequencing, or number of extended labels. 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, it does not compress the data. With volume copy, unused spaces between data sets being copied are not copied to the output diskette.

The output diskette 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, any unallocated space that may exist between the previously existent data sets will not be compressed out. Both the input and output diskettes must be online (inserted into separate diskette drives) for the duration of the copy.

Note: 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, 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.

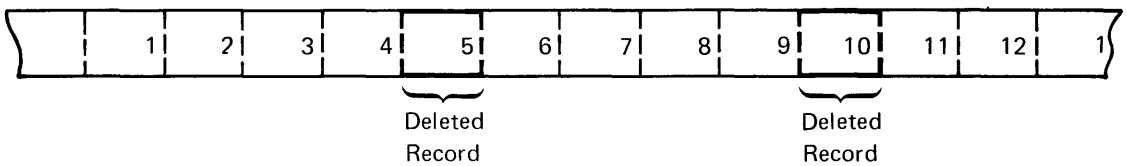
This copy function lets you combine data from up to four data sets and write the data to a single data set. A maximum of four input data sets can be specified and copied at one time. The data sets to be copied are combined in the order specified. Any of the four input data sets may be multivolume. Only one input data set and the output data set need by 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* in Chapter 1.

  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. The data set that is allocated by the copy utility is assigned the exchange type of the first input data set. 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 space 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 date 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 record 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 have *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

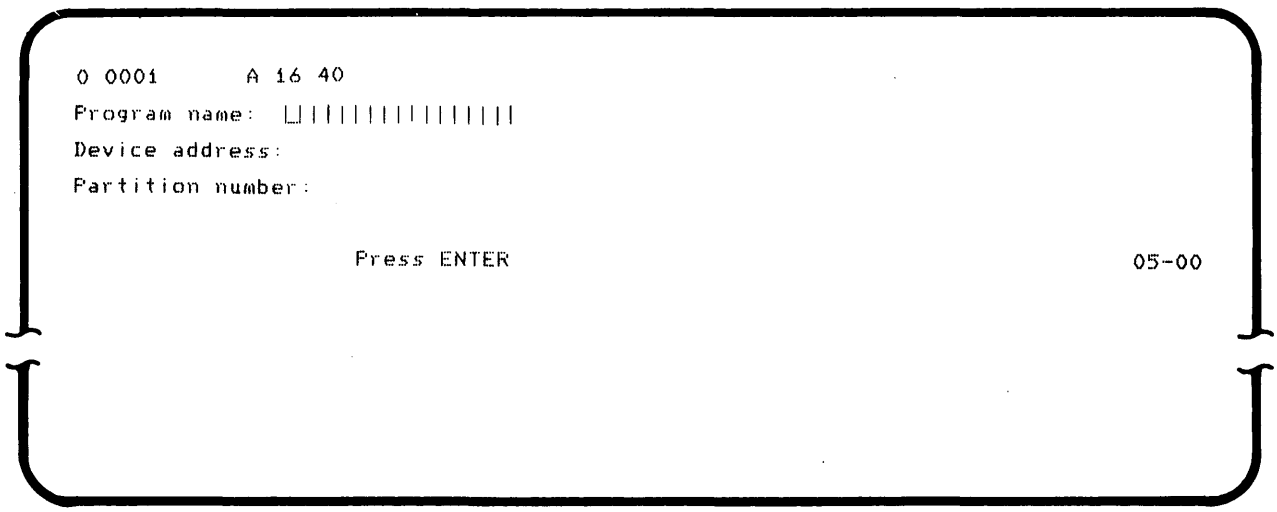
Single drive data set copy allows you to use one diskette drive to make a copy of a data set. Space for the output data set must be allocated before you execute the utility. See Chapter 3, *The Diskette Label Maintenance Utility* for information about data set space allocation. If the output data set 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.

Operation of the Copy Utility

Load the Utility (05-00)

To load the utility, respond to the following prompt:

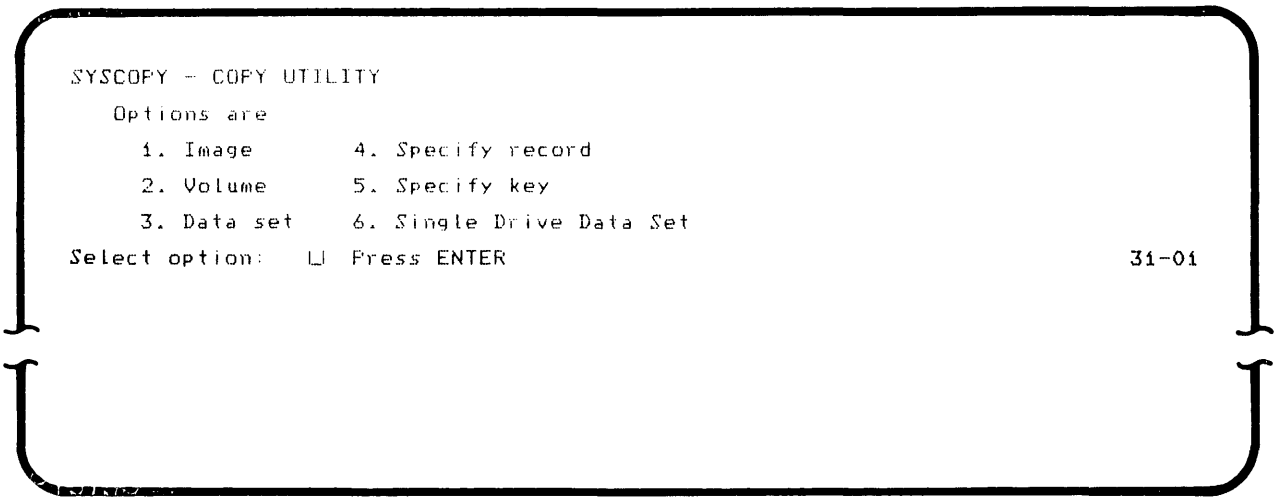


1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYSCOPY as the program name.
3. Enter the device address of the diskette drive where the utility is inserted.
4. Enter the number of the partition where the program will execute. (If a partition number is not entered, the number 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.



Select an option and press the Enter key:

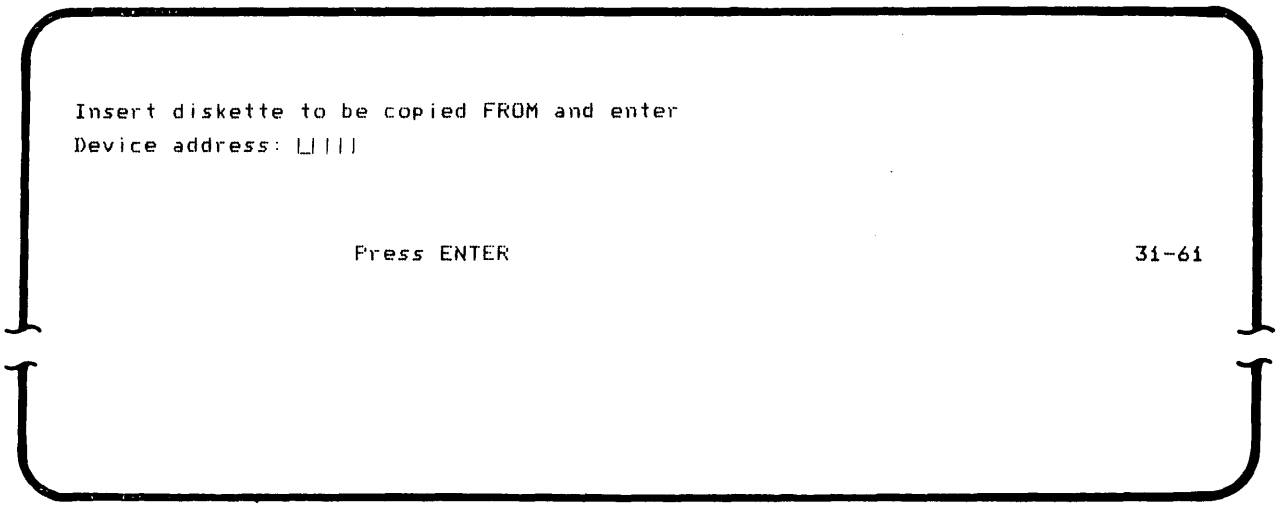
- Enter a 1 to use the image copy function and copy the entire contents of one diskette to another of the same type and initialization. The input diskette prompt (31-61) is displayed. See *Image Copy* to continue.
- Enter a 2 to use the volume copy function and copy the entire contents of one diskette to another of the same or different type and initialization. The input diskette prompt (31-61) is displayed. See *Volume Copy* 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* 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* 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* 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* 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:



1. Insert the input diskette into a diskette drive and enter the diskette device address.

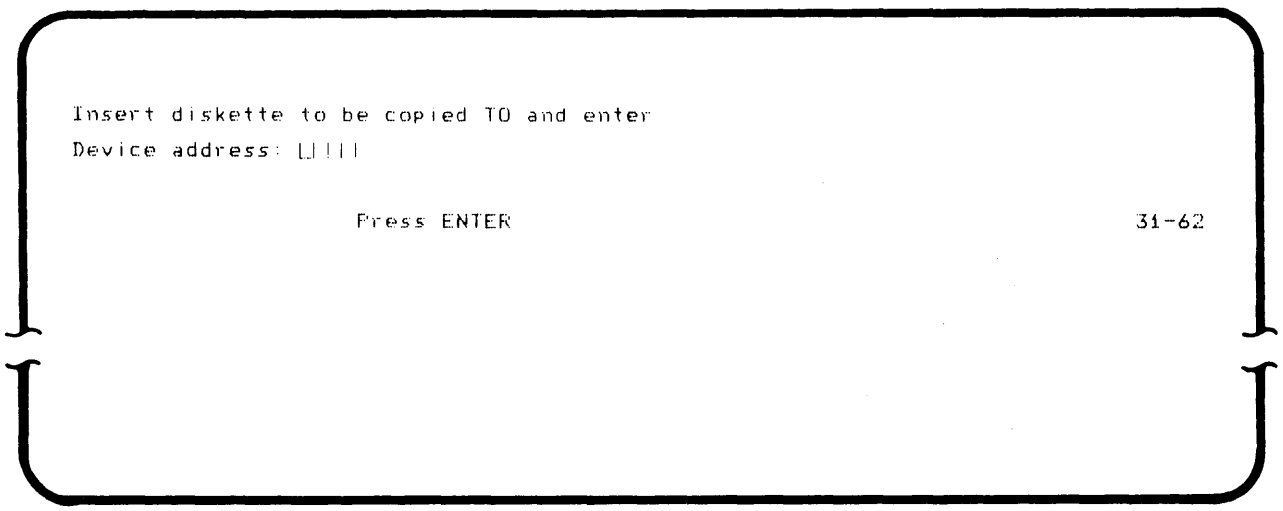
2. Press the Enter key.

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:



1. 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.)

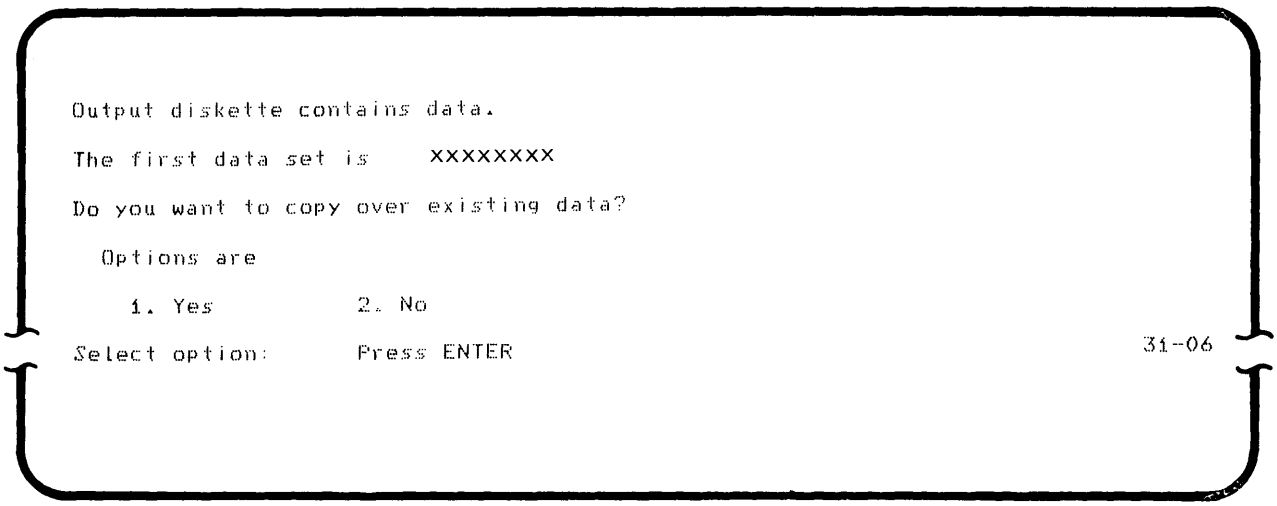
2. Press the Enter key.

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.

When the output diskette 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 insert input diskette prompt (31-64) is displayed.

Output Diskette Contains Data Sets (31-06)

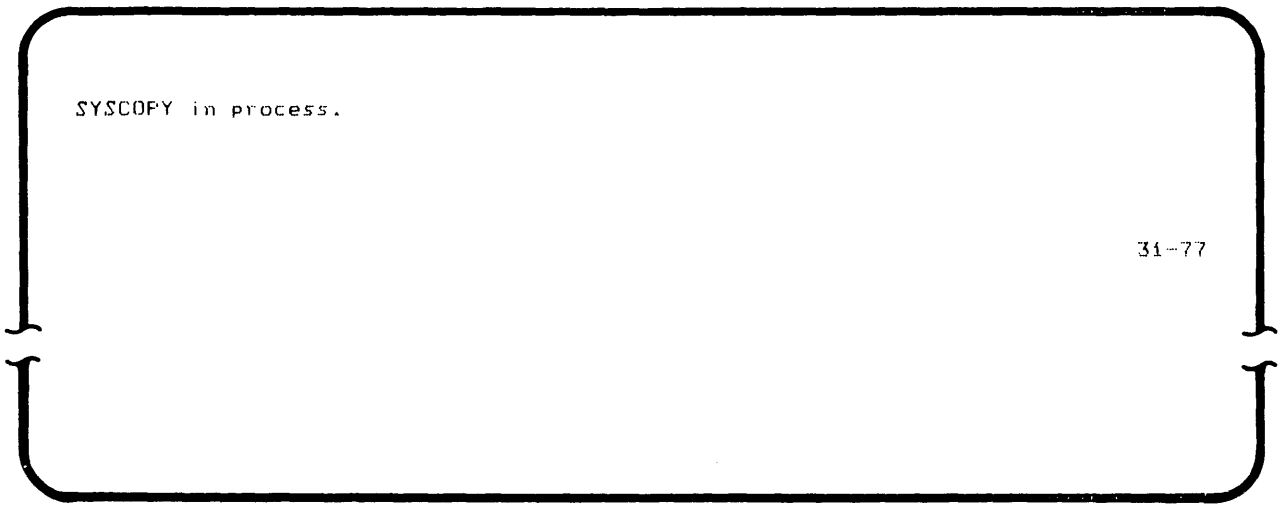


If you want to copy over the existing data sets, enter 1 and press the Enter key. The data sets are deleted from the diskette and the copy process begins.

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 diskette drives:

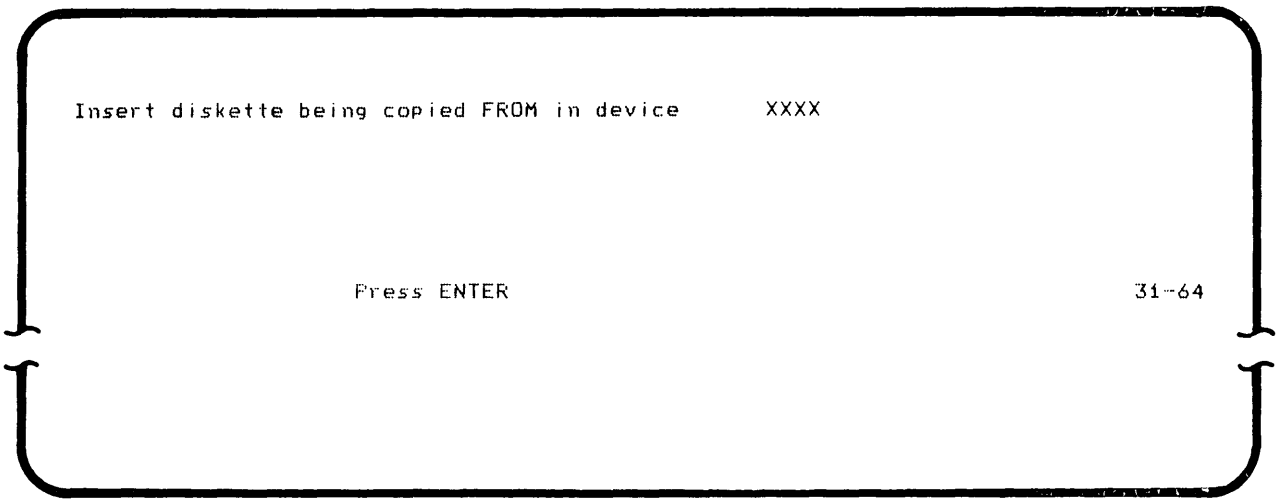


The message is displayed when the copy starts and remains displayed until it is completed. During the actual copy, all labels and the data on tracks 1 through 74 are copied to the output diskette.

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

Insert the Input Diskette (31-64)

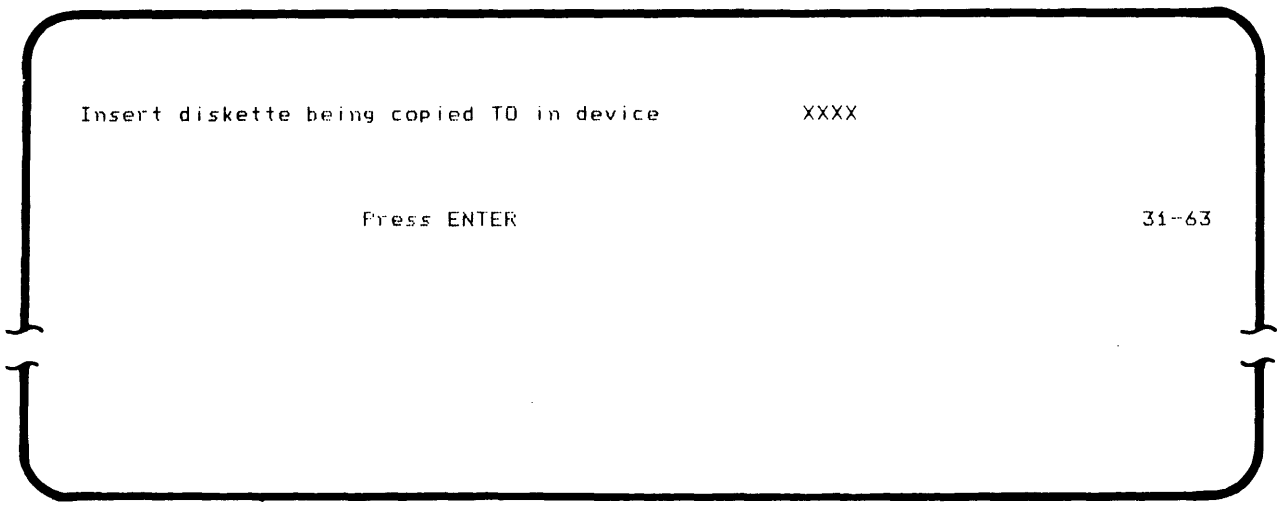
If you are using a single drive to make the copy, the following prompt is displayed:



1. Insert the input diskette at the address in the field indicated by the 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)



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)

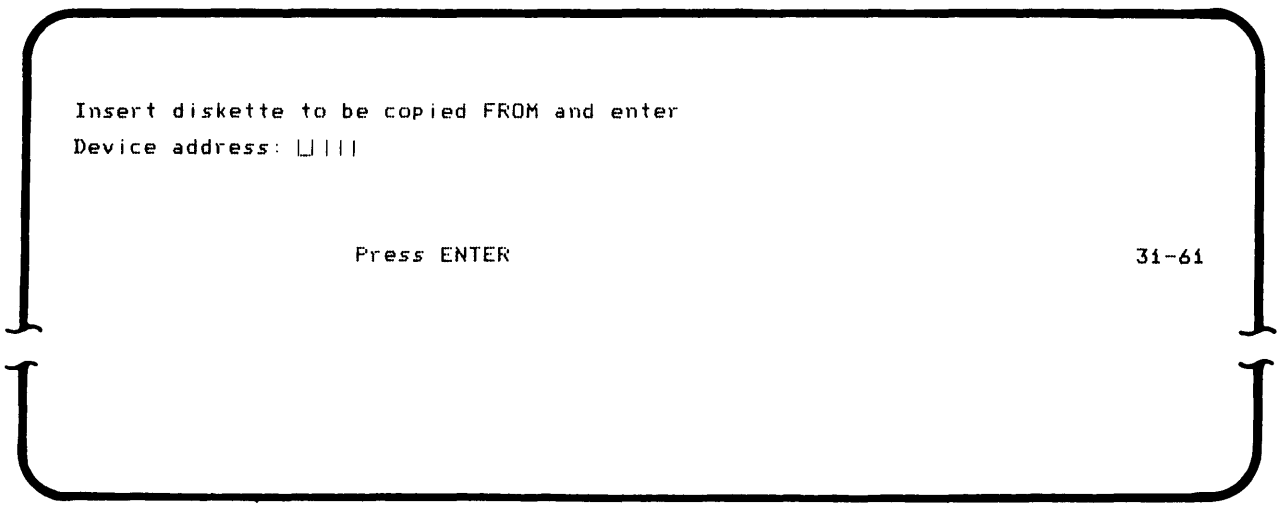
When the image copy is successfully completed, the utility-completed prompt (31-78) is displayed, allowing you to exit the utility or restart the image copy function. If you restart the image copy, the input diskette prompt (31-61) is redisplayed. If you want to perform a different type of copy, you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

VOLUME COPY

This copy function requires the use of two diskette drives.

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:



1. Insert the input diskette into a diskette drive and enter the diskette device address.

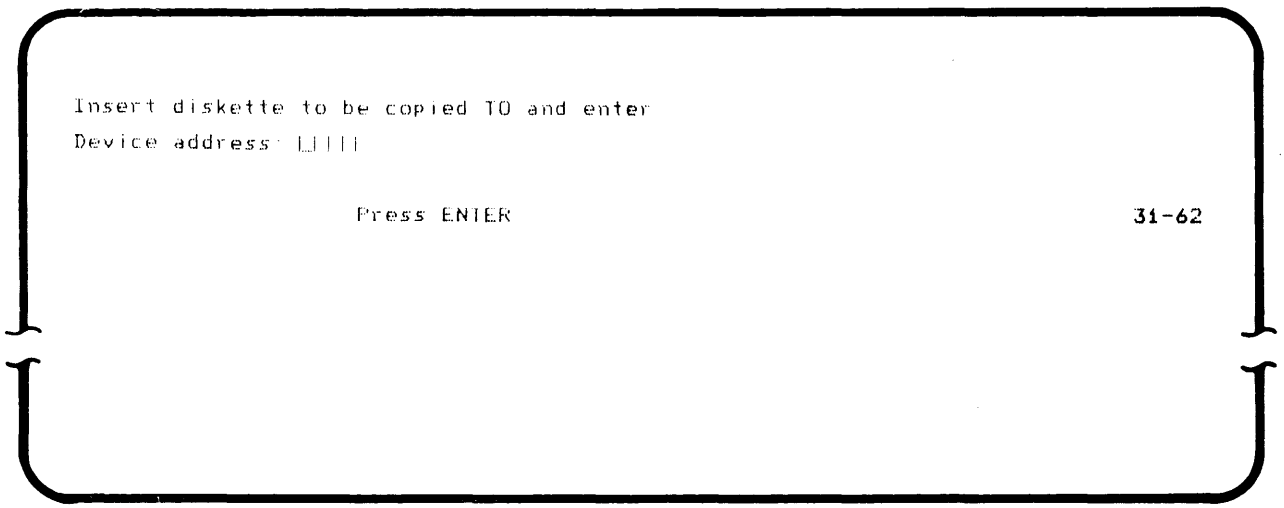
2. Press the Enter key.

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

When the input diskette is successfully accessed, the output diskette prompt (31-62) is displayed.

Insert the Output Diskette (31-62)

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



1. Insert the output diskette into a diskette drive and enter the diskette device address.

2. Press the Enter key.

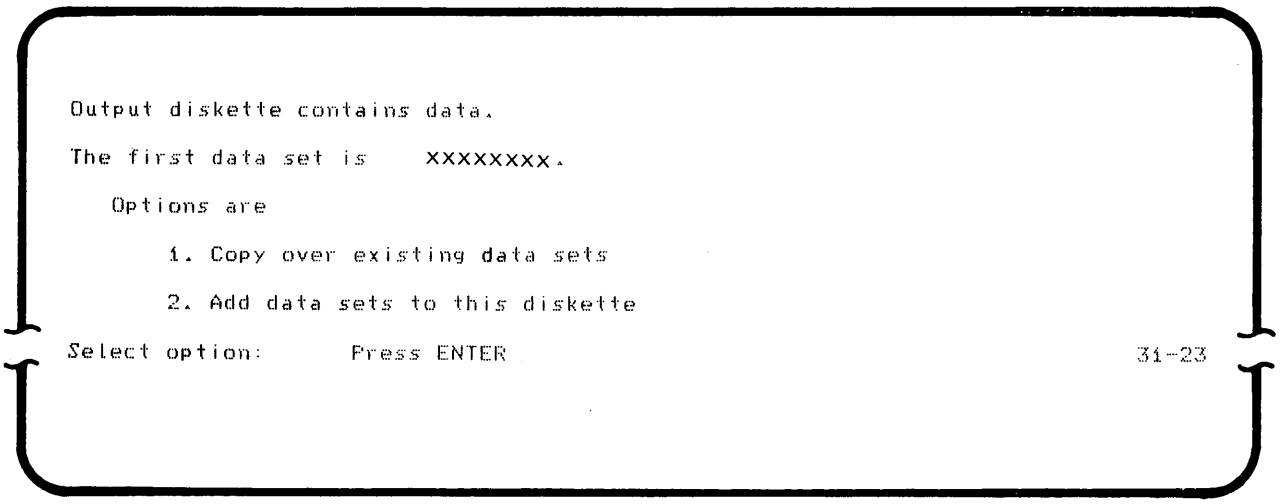
If the output diskette is volume-protected, and if the owner ID is different from the input diskette owner ID, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key to continue.

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

If the output diskette does not contain allocated data sets, the copy process begins. The copy in process prompt (31-77) is displayed.

Output Diskette Contains Data (31-23)

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



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

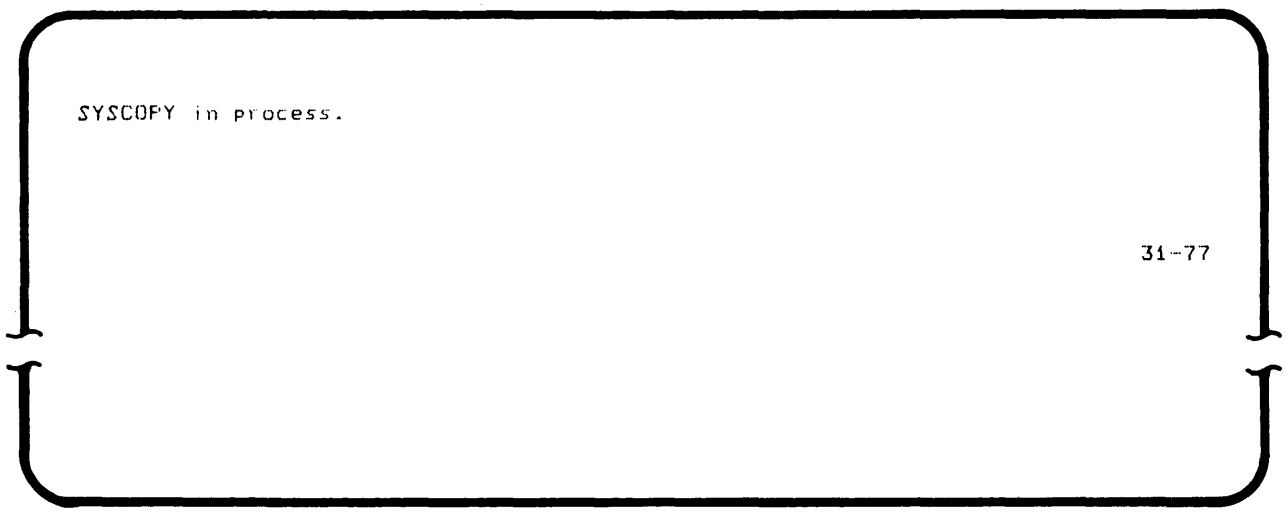
If you select option 1 to copy over existing data sets, the data sets on the output diskette are deleted. The copy begins, and the copy-in-process prompt (31-77) is displayed.

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

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

Volume Copy in Process (31-77)

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



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

Data sets are allocated on the output diskette while the copy is in process. The newly allocated data sets have the same record lengths as the corresponding data sets on the input diskette. The exchange types are also the same as for the data sets on the input diskette 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.

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.

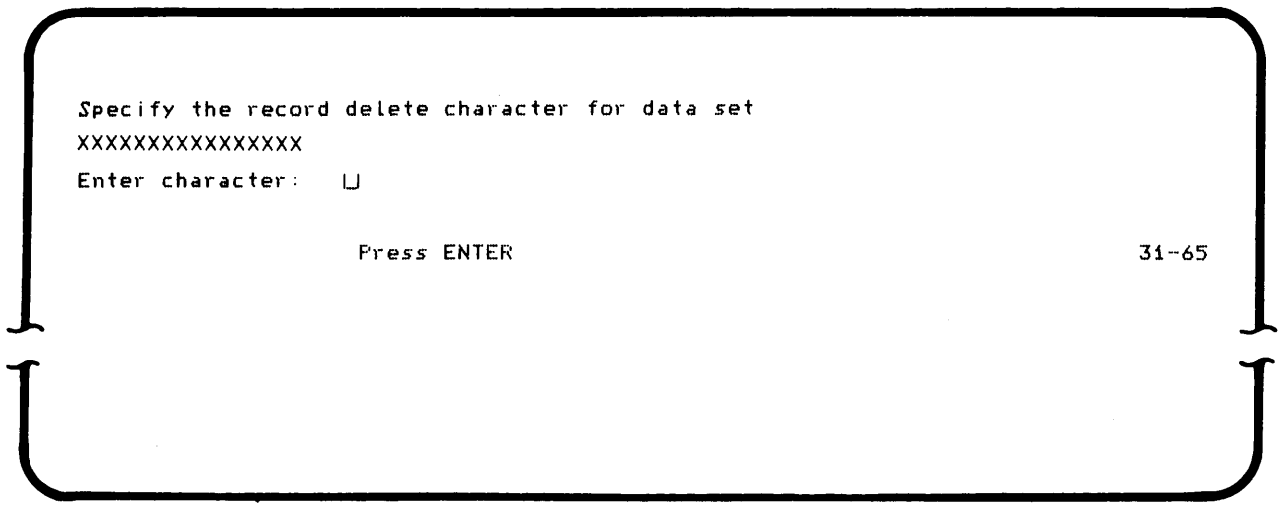
If the utility runs out of space on the output diskette while copying a data set, the multivolume prompt (31-66) is displayed. If there is not enough room to allocate a continued multivolume data set on the output diskette, an error occurs and the utility is terminated.

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

Note: An IPL diskette must be copied to an empty diskette because the IPL data sets must be the first data sets on the diskette.

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:



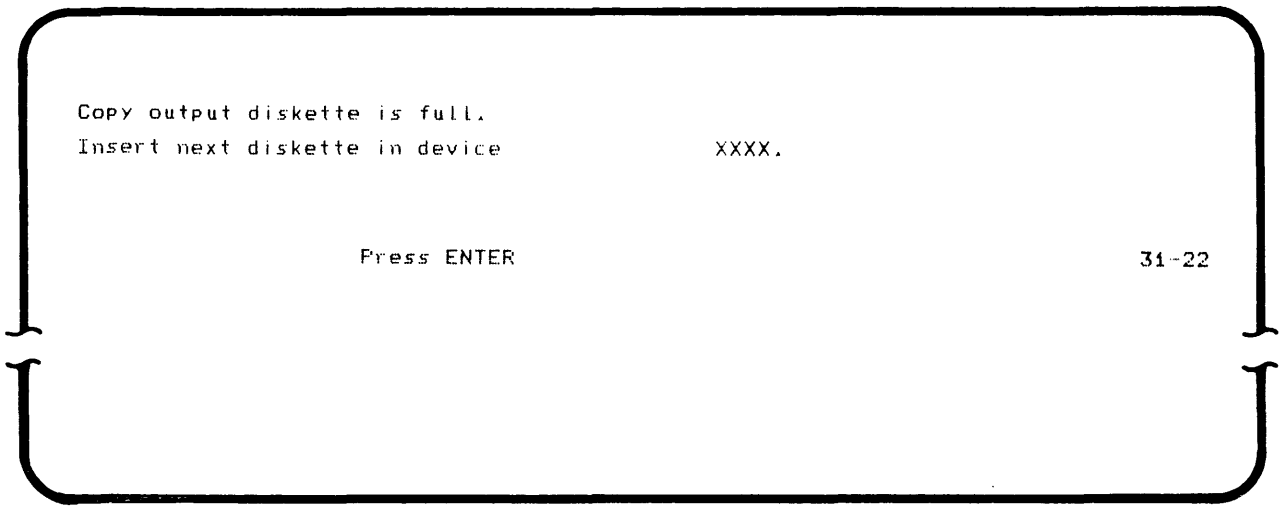
1. Specify a unique delete character, one that will never appear in the last position of a valid record. Valid delete characters are A through Z and . , ; & # * - @ $ % and 0 through 9. You can specify a blank (no entry) if there will be no deleted records.

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 while attempting to allocate an output data set, the following prompt is displayed:



1. Insert the next output diskette at the address in the field indicated by the Xs.

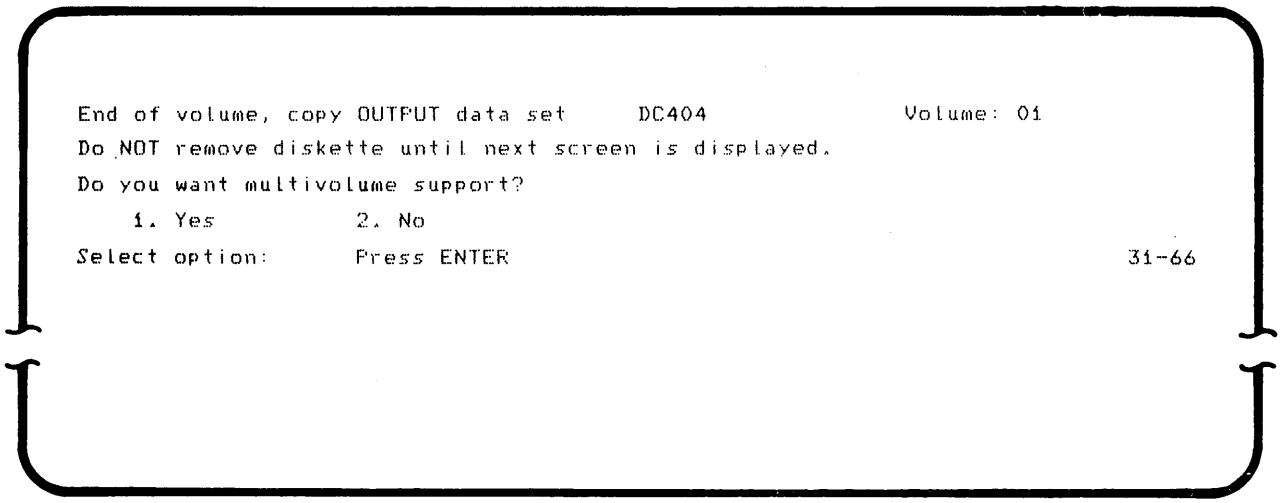
2. Press the Enter key.

If the diskette 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. 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 (for the output data set), the following prompt is displayed:



The first line one 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.

Do not remove the output diskette until the next prompt is displayed.

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

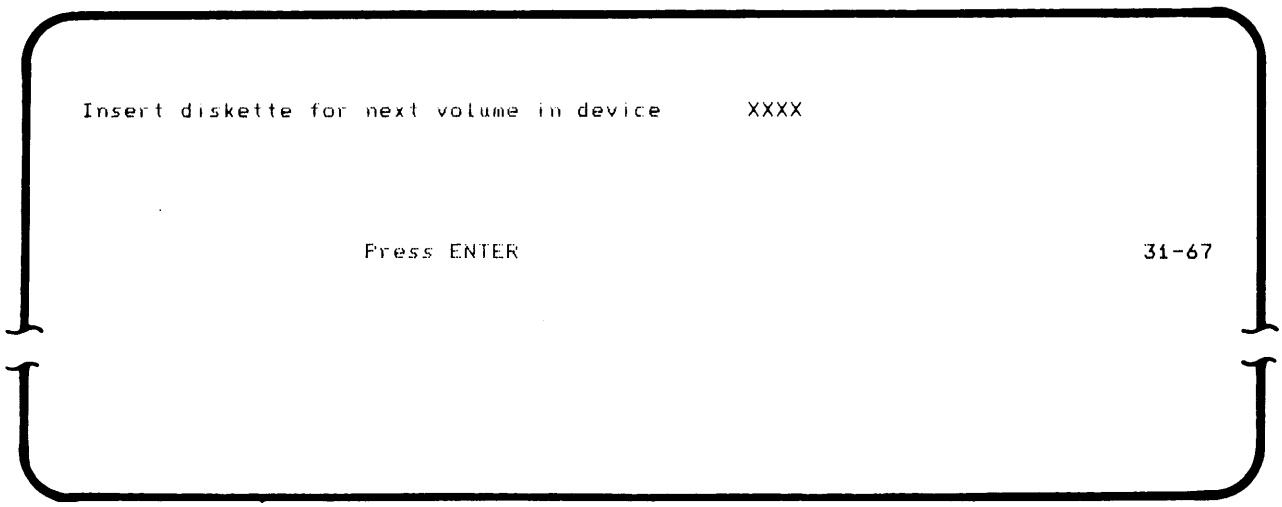
2. Press the Enter key.

If you select option 1, the data set is continued on the next diskette. 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 and the utility-terminated prompt (31-79) is displayed. Any data sets completely copied to the output diskette before termination are not deleted on the output diskette.

Insert Diskette for Next Volume (31-67)

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



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

1. Remove the full output diskette and insert the next output diskette at the address in the field indicated by the Xs.

2. 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, 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)

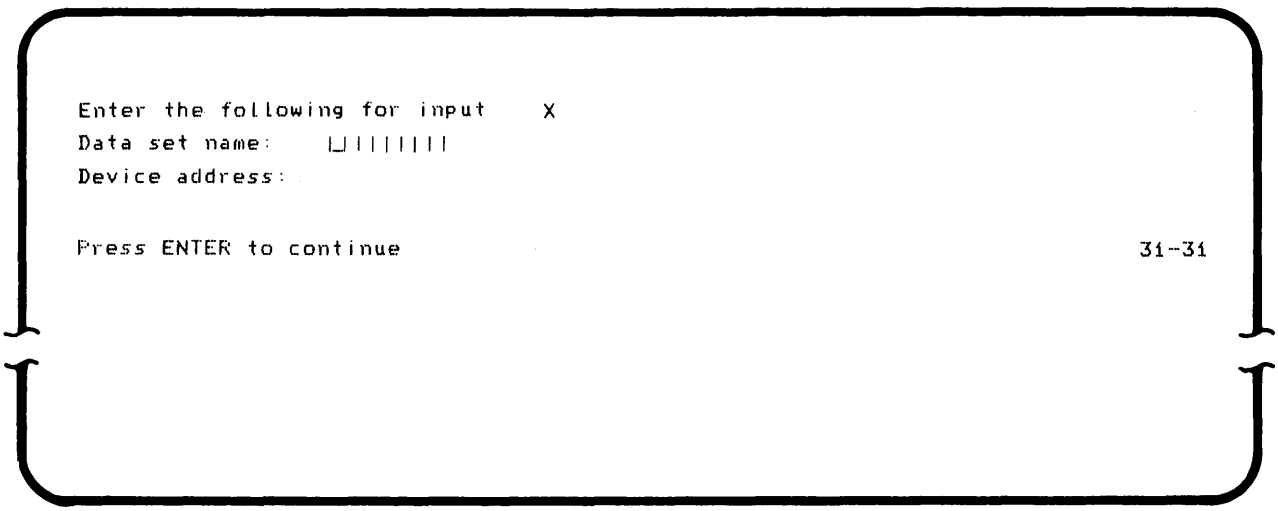
When the copy is successfully completed, the completed prompt (31-78) is displayed allowing you to restart another volume copy or exit from the utility.

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:



1. Enter the name of the input data set and the address of the diskette drive.

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.

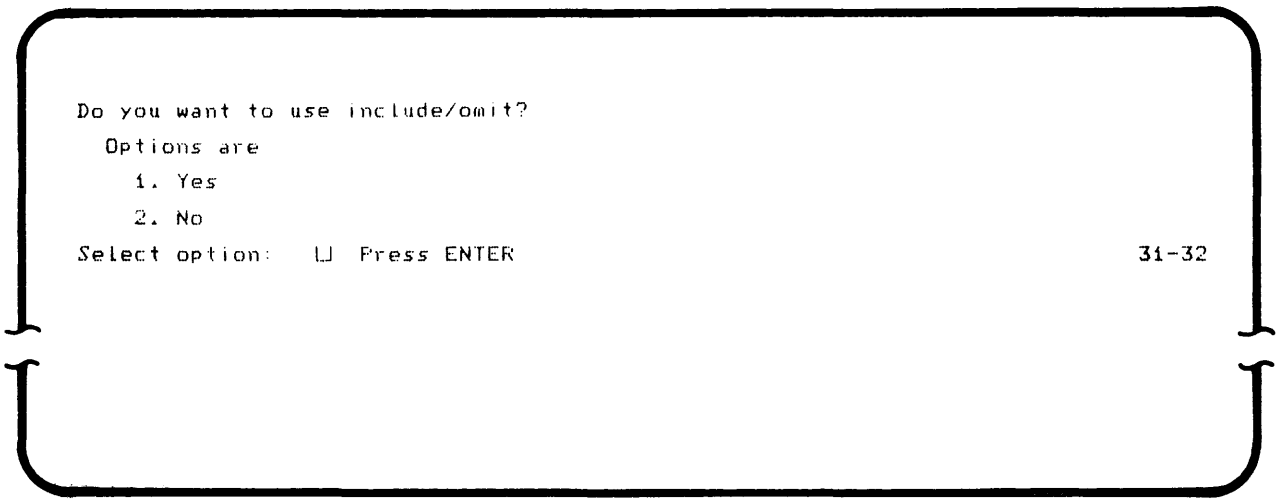
If less than four input data sets are to be copied when you have entered all your data sets, make no entries for the next prompt. The data set(s) already specified will be copied.

If the diskette is volume-protected, the volume-protected prompt is displayed. Enter the owner ID 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)

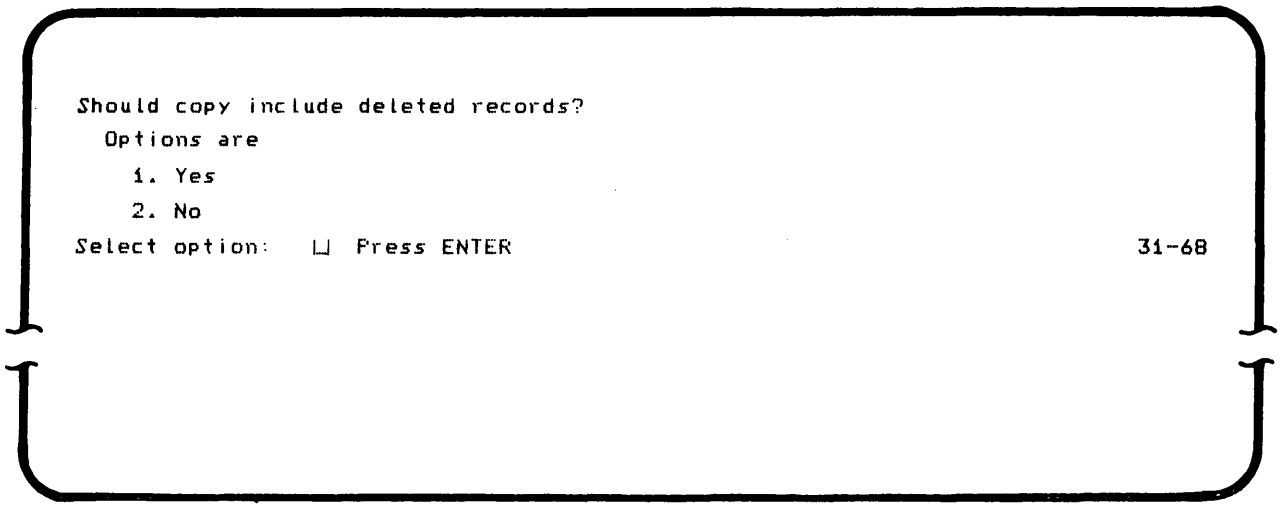
Once the first input data set is opened, the following prompt is displayed:



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)



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 onput data set.

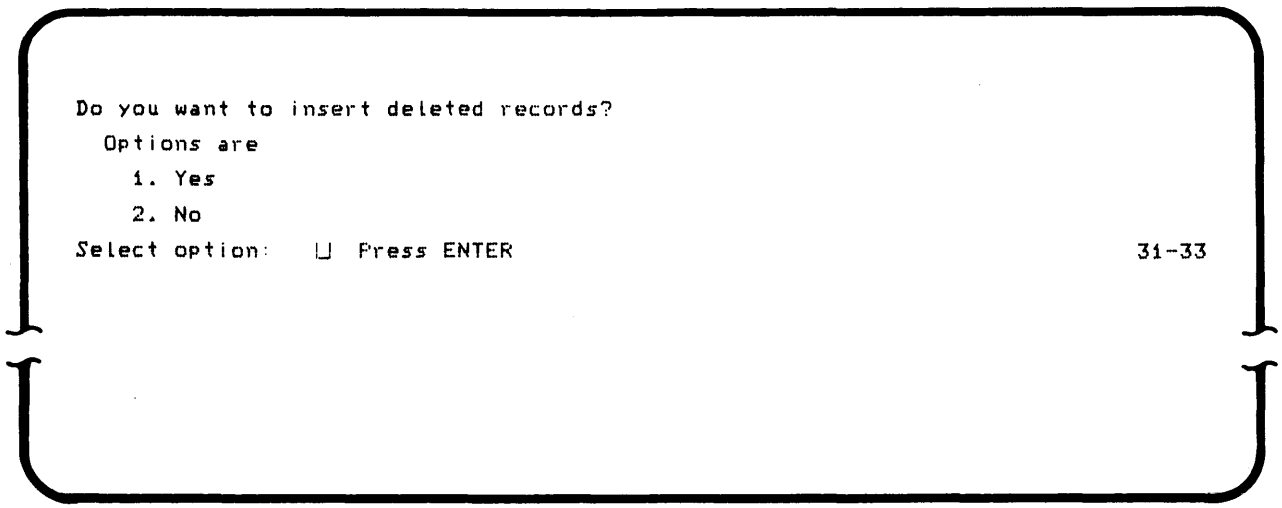
2. Press the Enter key.

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:

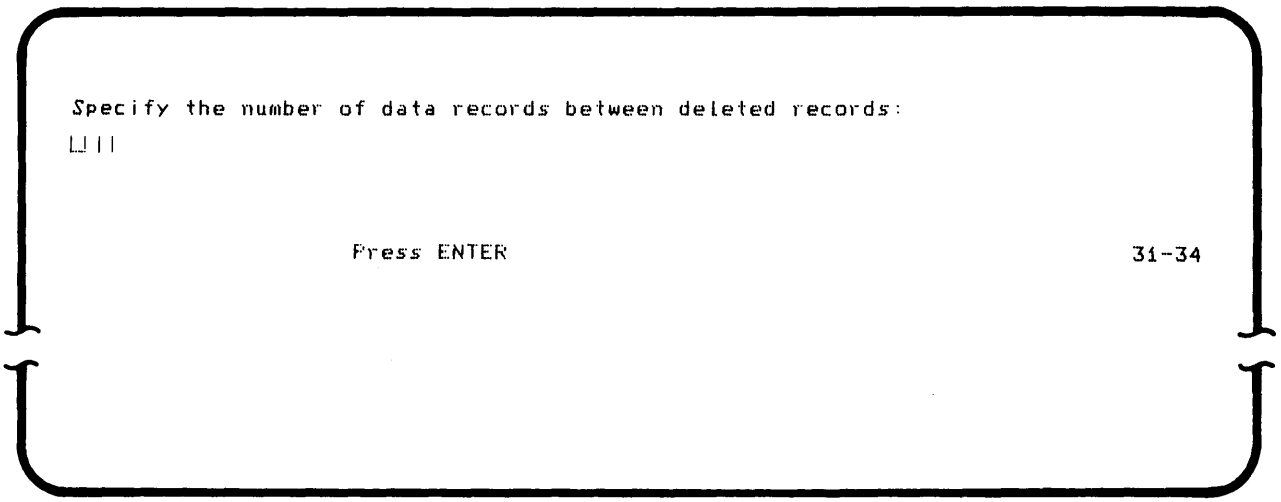


1. Specify whether to insert deleted records into the output data set.
2. Press the Enter key.

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:



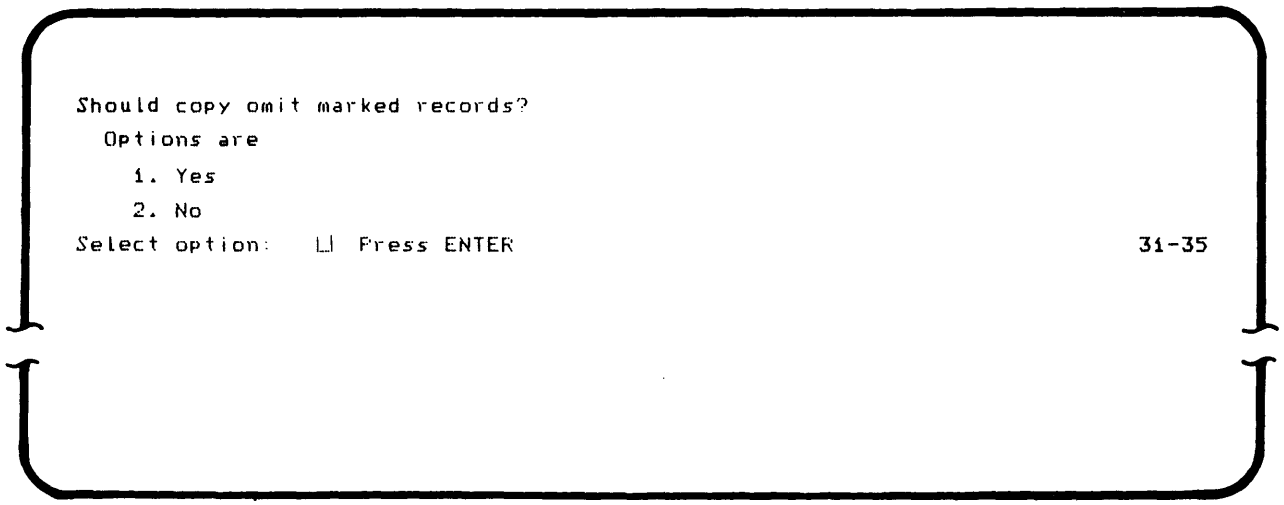
1. Specify the number of valid data records you want between each deleted record.

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)



1. Specify whether or not to omit marked records.

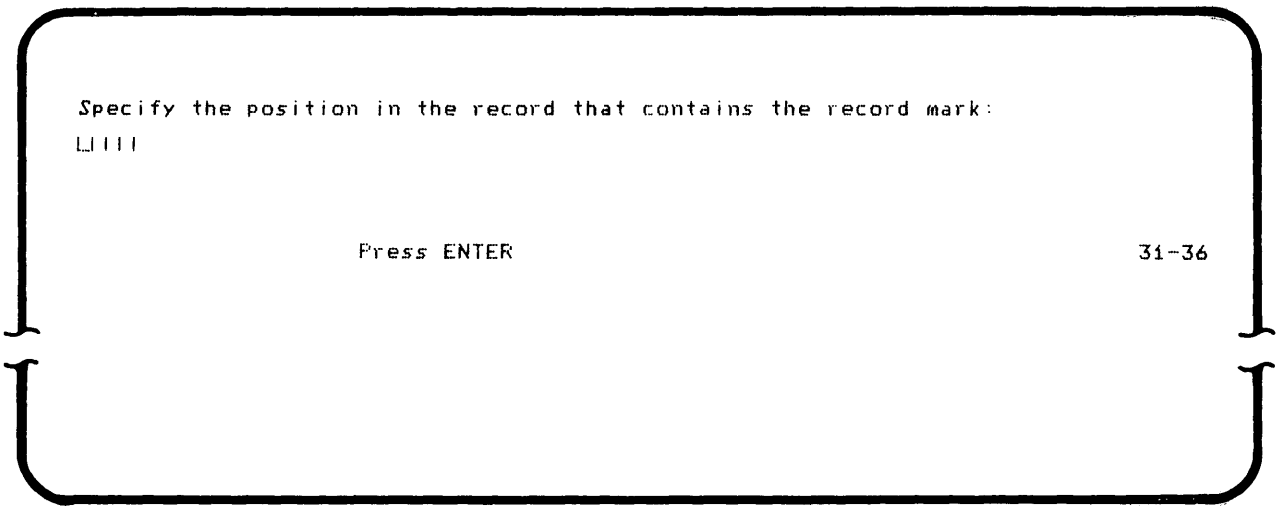
2. Press the Enter key.

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:

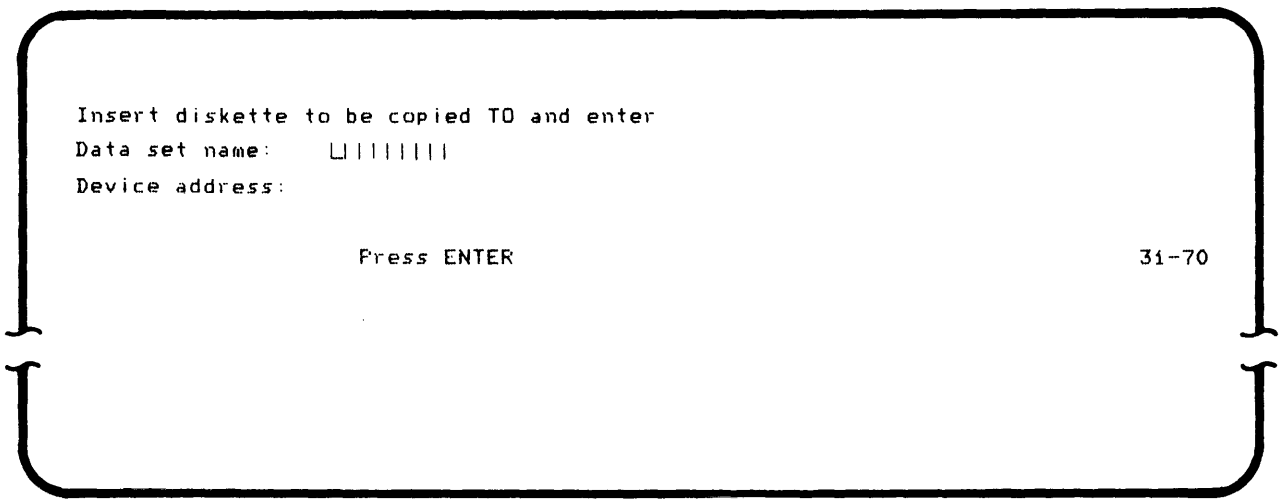


1. Specify the position in the record where the record mark can be found.
2. Press the Enter key.

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:



1. 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 on the diskette, it must have the same record length as the input data sets.)
3. Enter the device address for the output diskette.
4. Press the Enter key.

If the output diskette is volume-protected and has a different owner ID than the last owner ID specified, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key to continue.

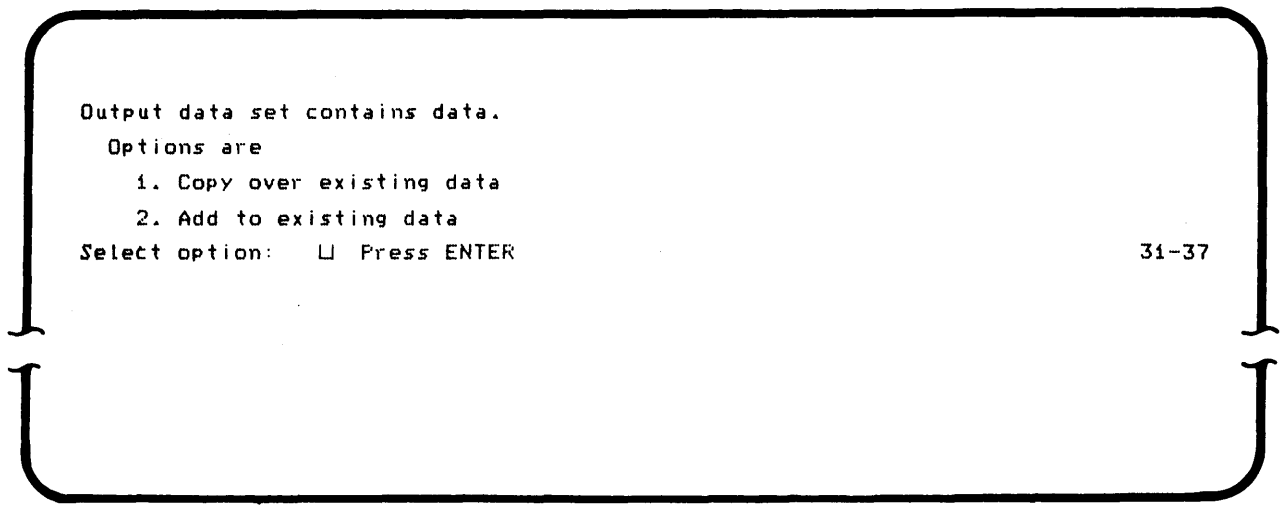
If the output data set contains data, the data set contains data prompt (31-37) is displayed.

If the output data set cannot be found on the diskette, 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:



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

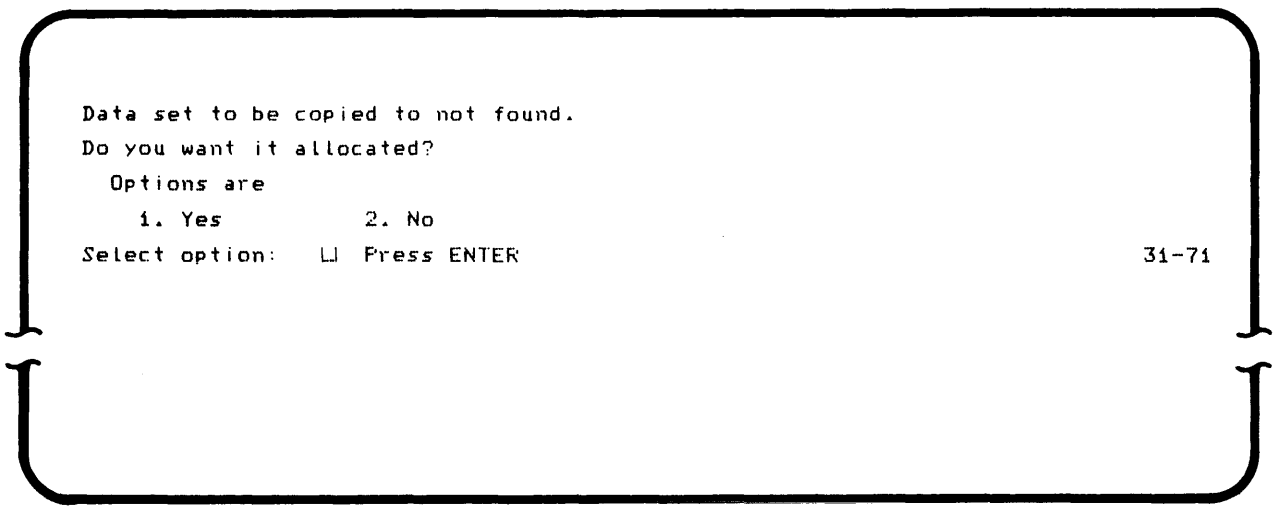
The preceding prompt warns you that the specified output data set contains data. If you select option 1, all the existing data will be dropped; the utility will write the output starting at the beginning of the data set. If you select option 2 to add to the existing data, the utility will write the output 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 diskette, the following prompt is displayed:



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 data set of a different exchange type is needed, you must allocate the data set before you start the copy. You can use the diskette label maintenance utility to preallocate the data set space.

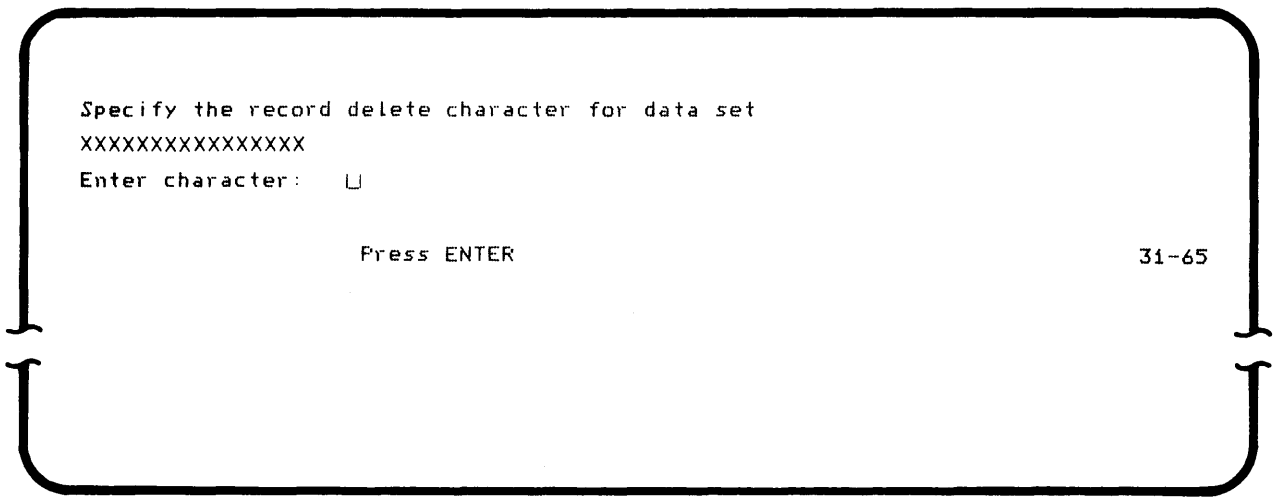
If you select option 2, the insert output diskette prompt (31-70) is redisplayed.

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.



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

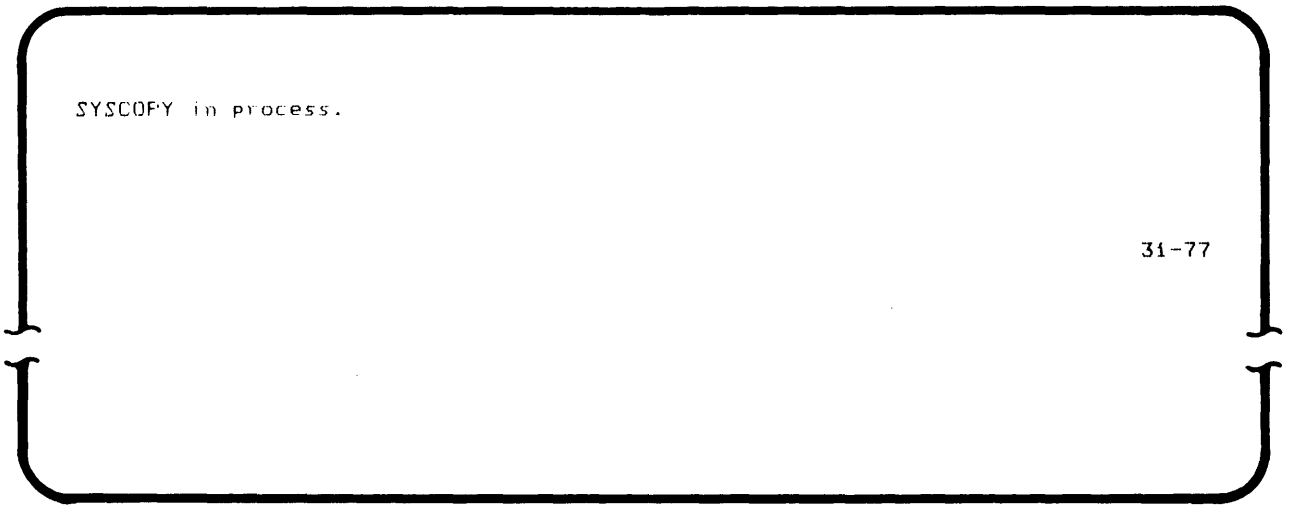
1. Specify a unique delete character, one that will never appear in the last position of a valid record. Valid delete characters are: A through Z and . , ; & # * - @ $ % and 0 through 9.

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 diskette 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:

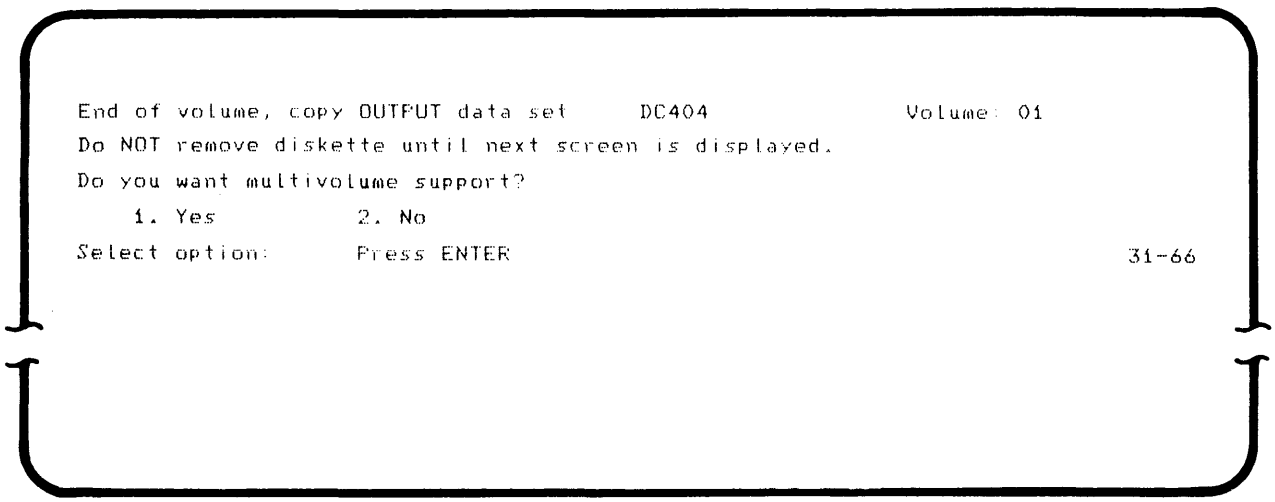
```
End of volume, copy INPUT data set      M1024A              Volume: 01
  Options are
    1. Insert diskette for next volume in device      4000
    2. Terminate input for data set
Select option:      Press ENTER                                        31-38
```

If you do not wish to copy other volumes of this data set, enter 2 and press Enter. 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.

If you want to copy other volumes, insert the diskette containing the next sequential volume in the diskette drive specified in the prompt. Enter 1 and press Enter. 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.

Specify Whether to Use Multivolume Output Support (31-66)

When the data set on the current output diskette is filled and there is more data to be copied, the following prompt is displayed:



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.

Do not remove the current output diskette until the next prompt is displayed.

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

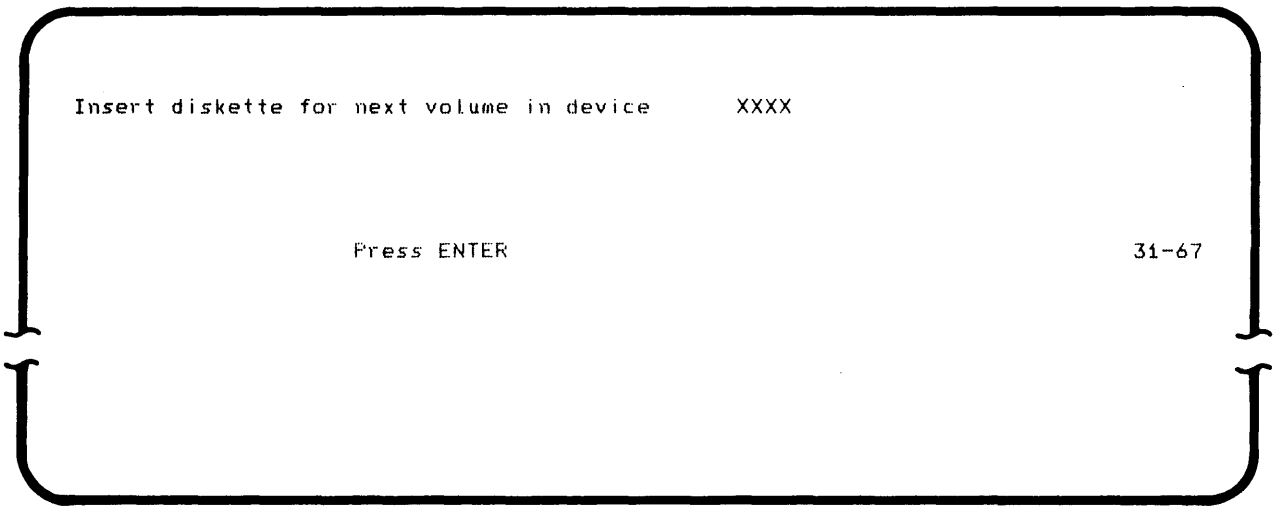
2. Press the Enter key.

If you enter a 1, the data set is continued on the next output diskette. 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:



Any additional output diskettes must have the same sector size as the initial output diskette.

1. Remove the current output diskette and insert the next output diskette at the address in the field specified by the Xs.

2. Press the Enter key.

If the diskette is volume protected and has a different owner ID than the last owner ID specified, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key to continue.

If additional output diskettes 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.

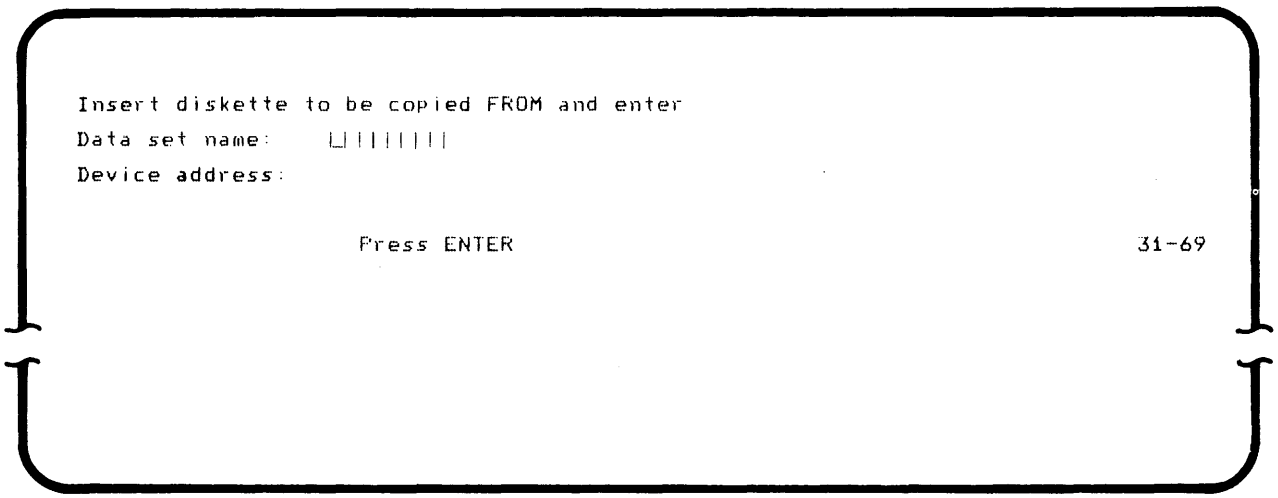
The copy in process prompt (31-77) is redisplayed.

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.

Insert Input Diskette (31-69)

If you entered option 4 in the select copy option prompt (31-01), the following prompt is displayed:

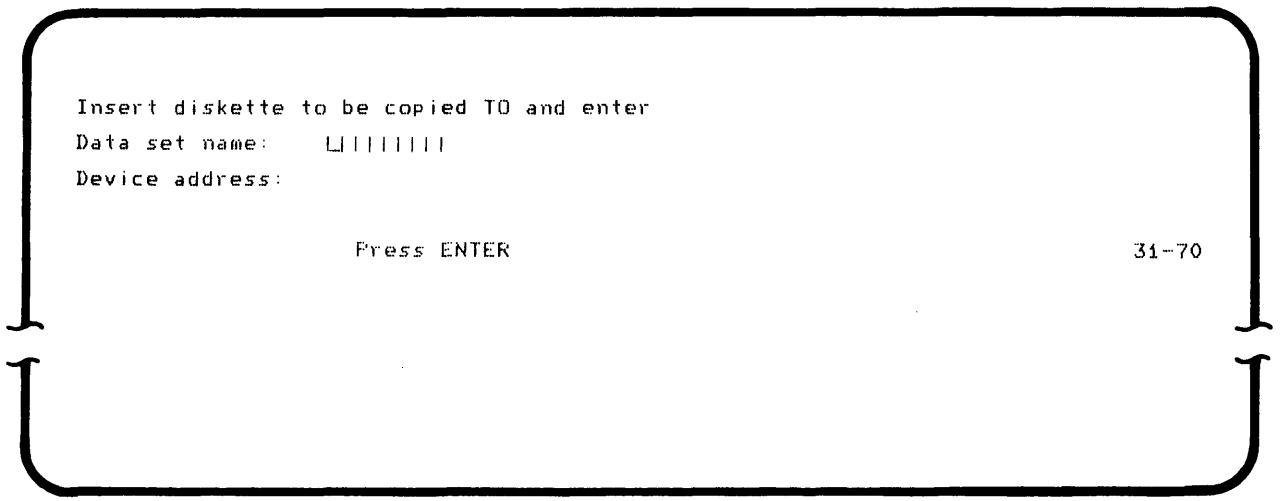


1. Insert the input diskette into a diskette drive.
2. Enter the name of the data set to be copied and the address of the diskette drive.
3. Press the Enter key.

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 output data set prompt (31-70) is displayed.

Insert Output Diskette (31-70)



1. 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 for the diskette drive.

3. Press the Enter key.

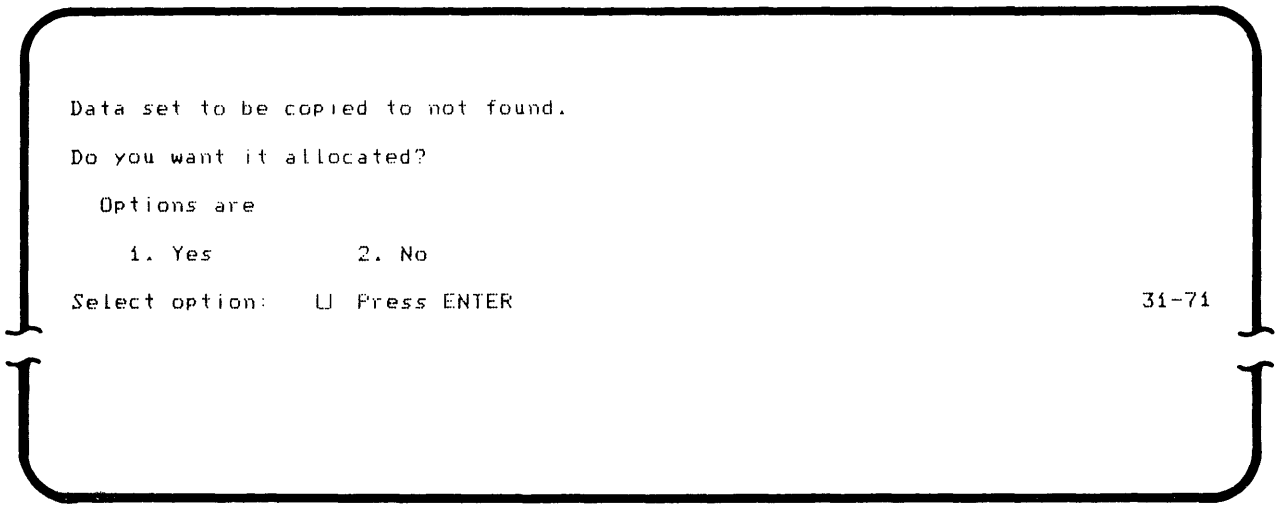
If the diskette is volume protected and has an owner ID that is different from the one for the input diskette, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key to continue.

If the output data set cannot be found on the diskette, 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:



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
```

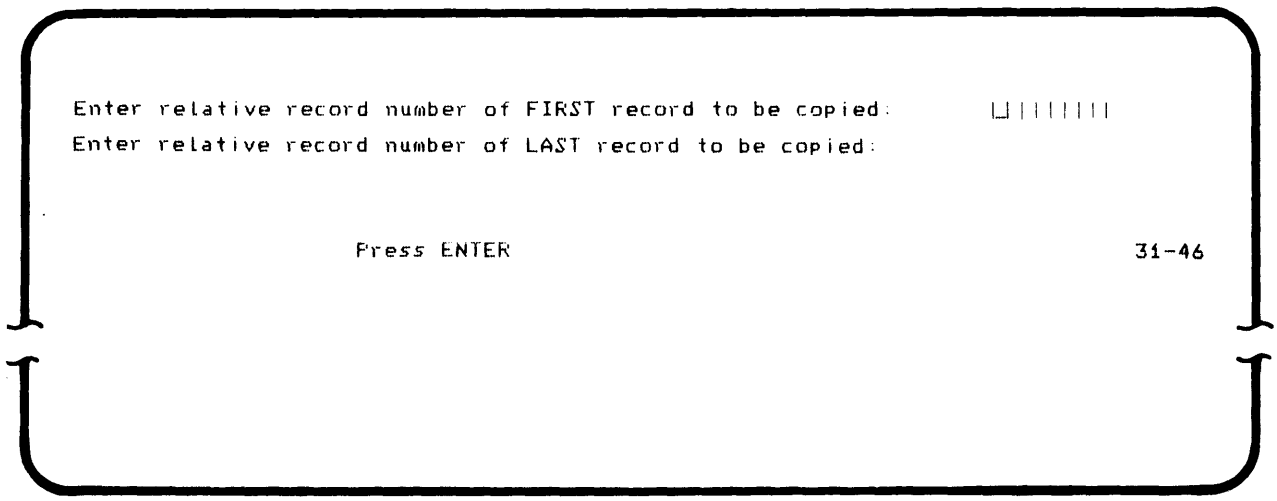
Note: If the input data set is I exchange and the label contains no delete character, the preceding prompt *is not* displayed.

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:



1. Specify the relative record number of the first record you want to be copied.

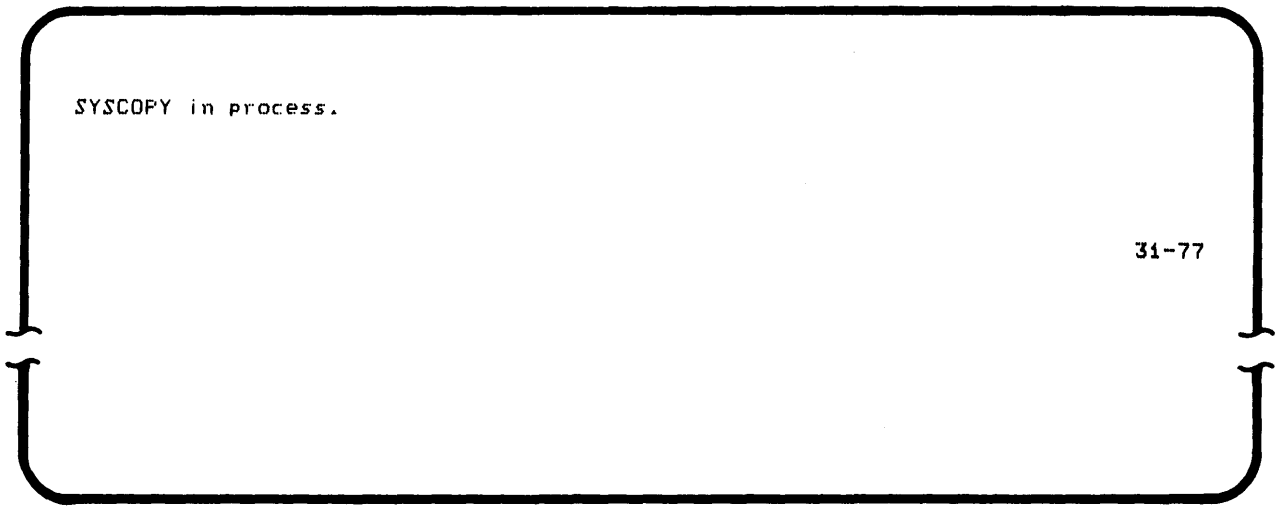
2. Specify the relative record number of the last record you want to be copied. If you leave this field blank, all remaining records in the data set are copied.

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:



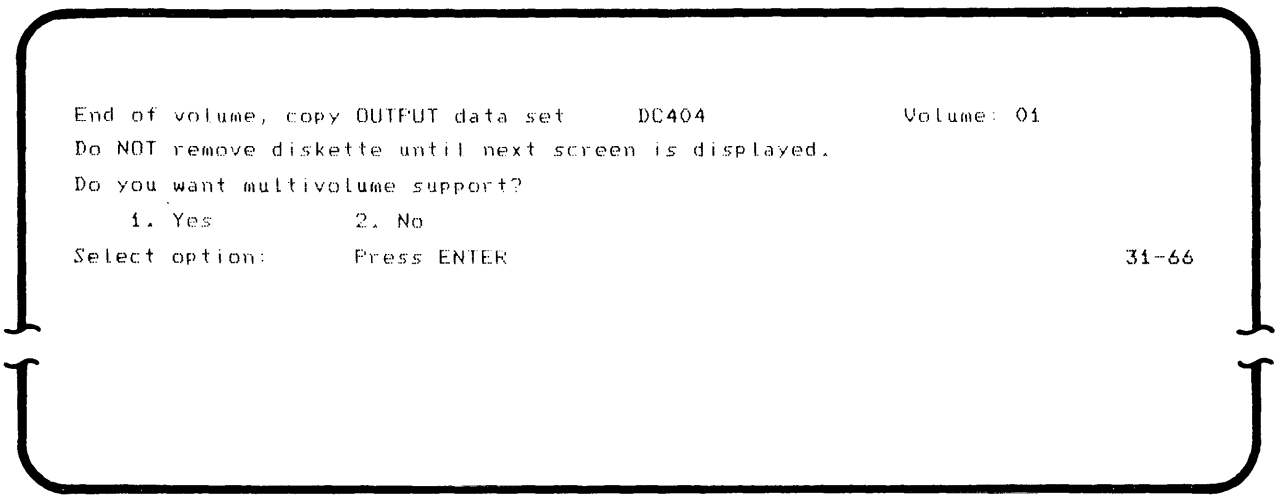
The records are copied to the output data set, beginning with the record specified as the first record to be copied, and including the record specified as the last record to be copied.

If the output diskette 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 cannot hold all of the data to be copied, the following prompt is displayed:



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.

Do not remove the current output diskette until the next prompt is displayed or the diskette alarm will sound.

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

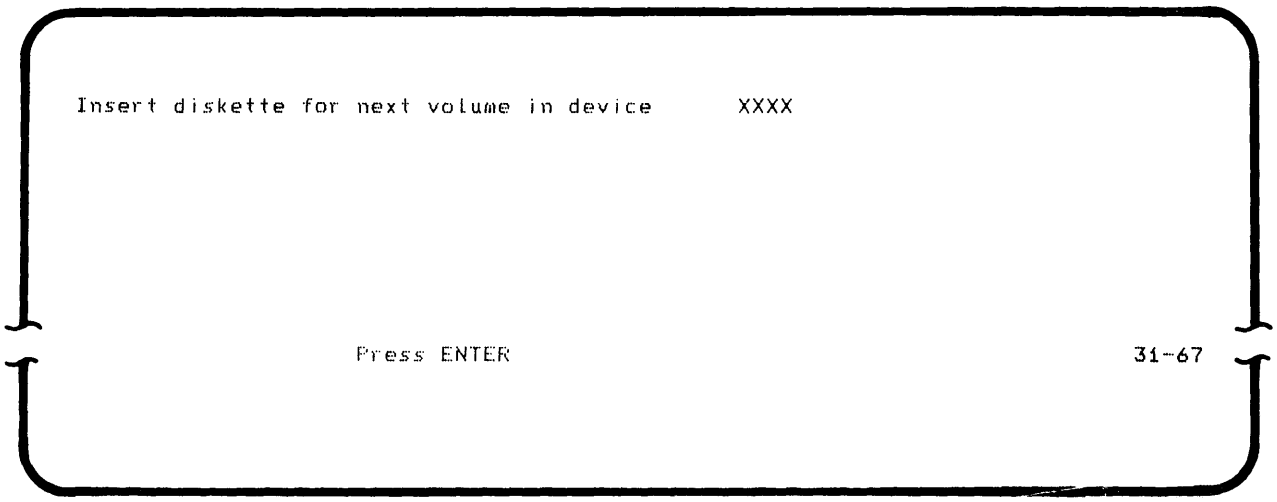
2. Press the Enter key.

If you enter a 1, the data set is continued on the next output diskette. 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:



Any additional output diskettes must have the same sector size as the initial output diskette.

1. Remove the current output diskette and insert the next output diskette at the address in the field indicated by the Xs.

2. 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 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.

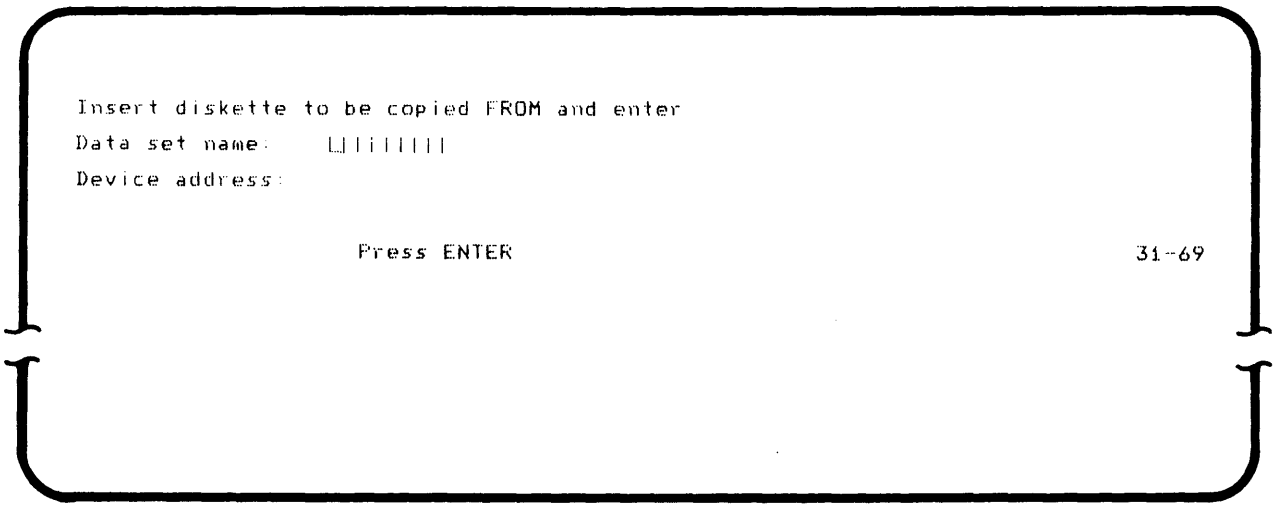
The copy in process prompt (31-77) is redisplayed.

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.

Insert Input Diskette (31-69)

If you enter option 5 in the specify copy option prompt (31-01), the following prompt is displayed:

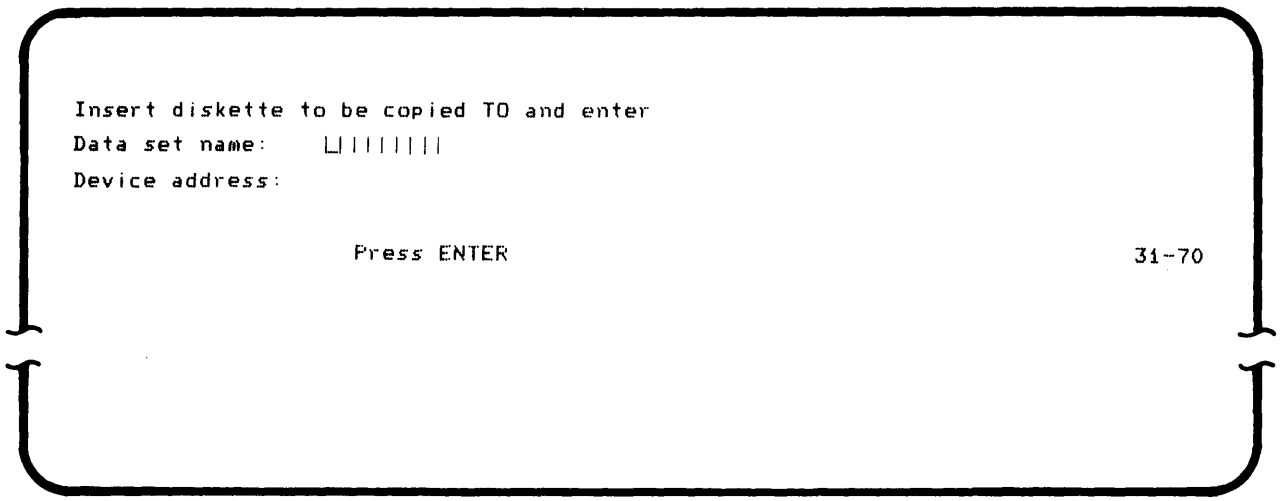


1. Insert the input diskette into a diskette drive.
2. Enter the name of the input data set and the address of the diskette drive.
3. Press the Enter key.

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

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

Insert Output Diskette (31-70)



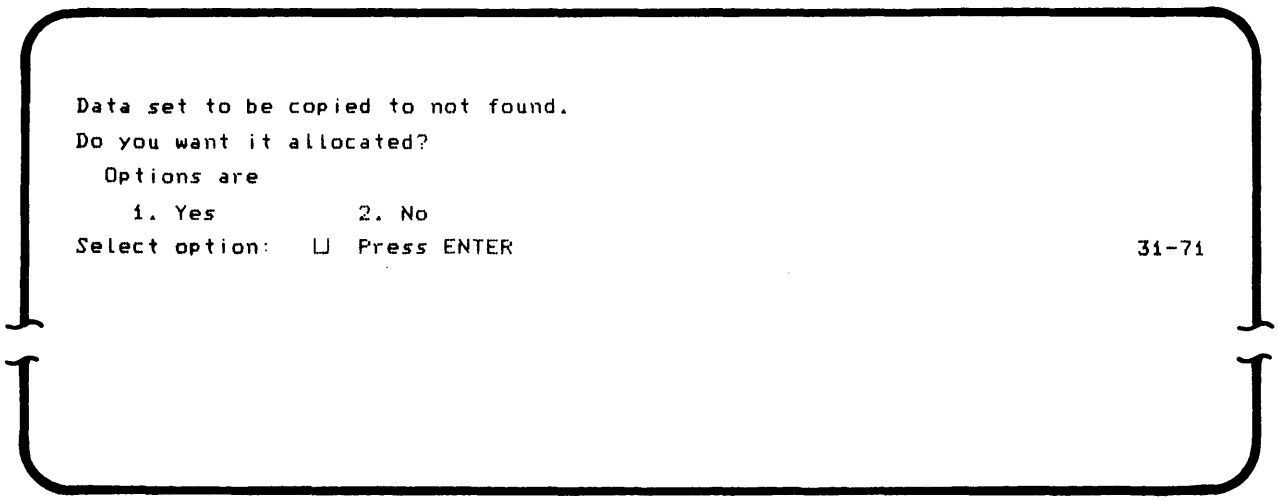
1. Insert the output diskette into a diskette drive.
2. Enter the name of the output data set and address of the diskette drive.
3. Press the Enter key.

If the diskette is volume-protected and has a different owner ID from the input diskette, the volume-protected prompt is displayed. Enter the owner ID and press the Enter key to continue.

If the output data set cannot be found on the diskette, 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:



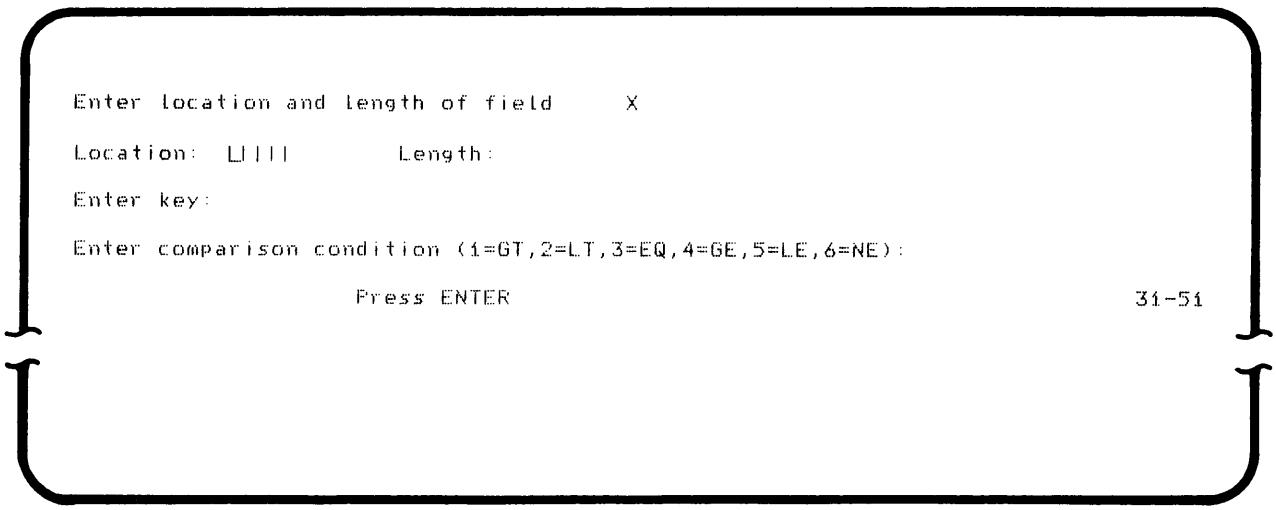
1. Select an option.

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)



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 leftmost 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)
Less than	(LT)
Equal	(EQ)
Greater than or equal to	(GE)
Less than or equal to	(LE)
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 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 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.

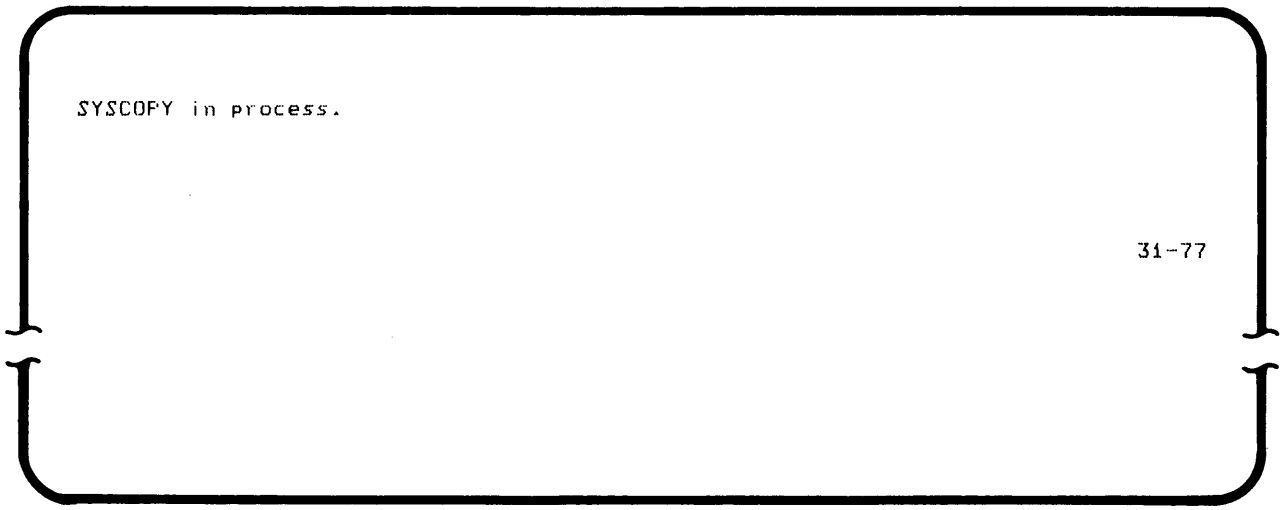
1. Select an option.

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:



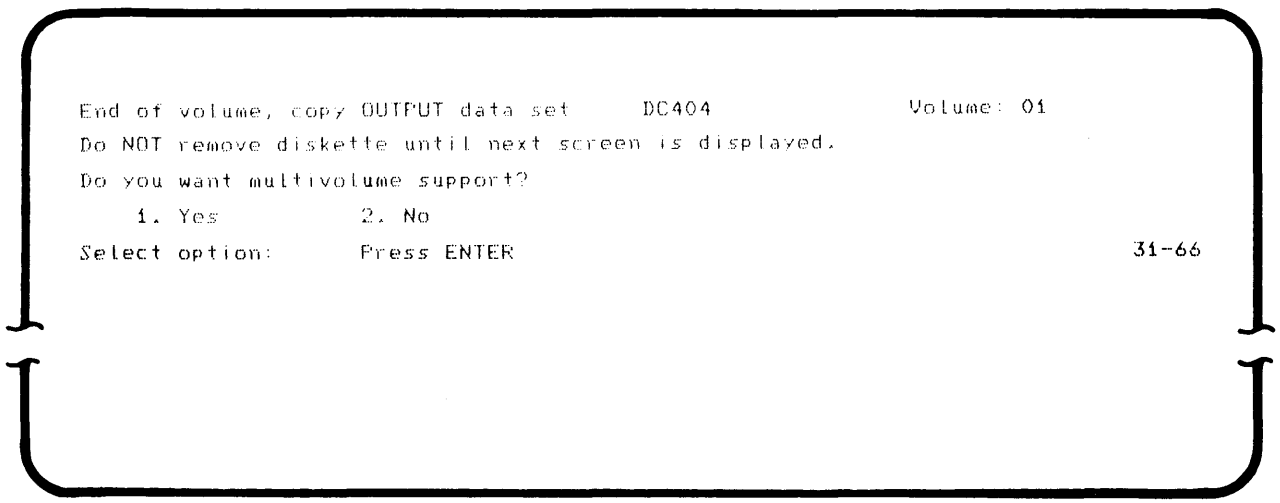
All records in the input data set that meet the specifications are copied to the output data set.

If the output diskette 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 cannot hold all of the data to be copied, the following prompt is displayed:



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.

Do not remove the current output diskette until the next prompt is displayed.

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

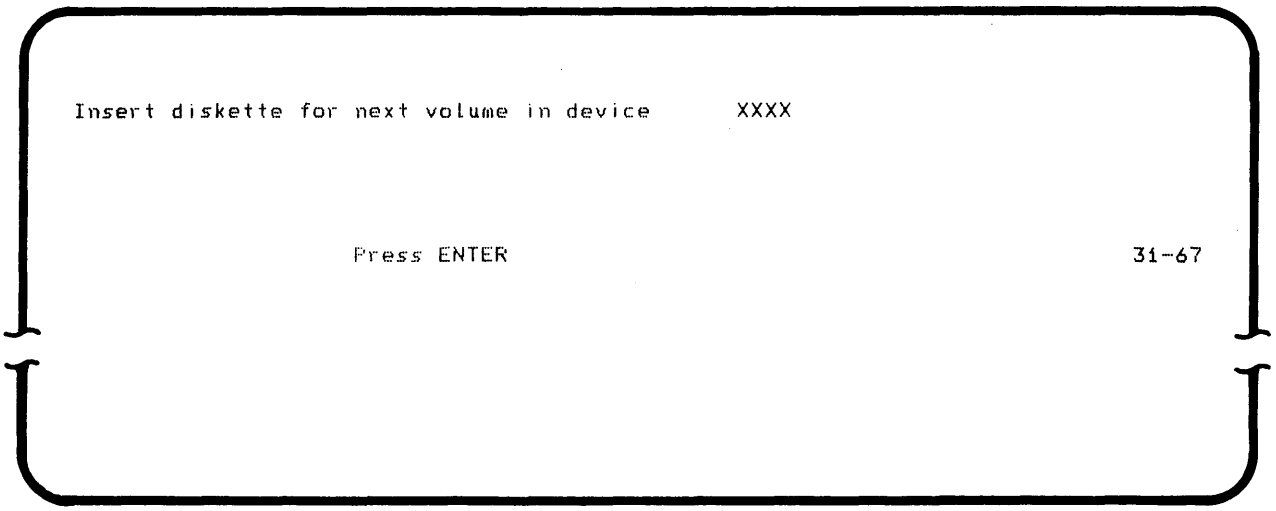
2. Press the Enter key.

If you enter a 1, the data set is continued on the next output diskette. 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:



Any additional output diskettes must have the same sector size as the initial output diskette.

1. Remove the current output diskette and insert the next output diskette at the address in the field indicated by the Xs.

2. 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 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.

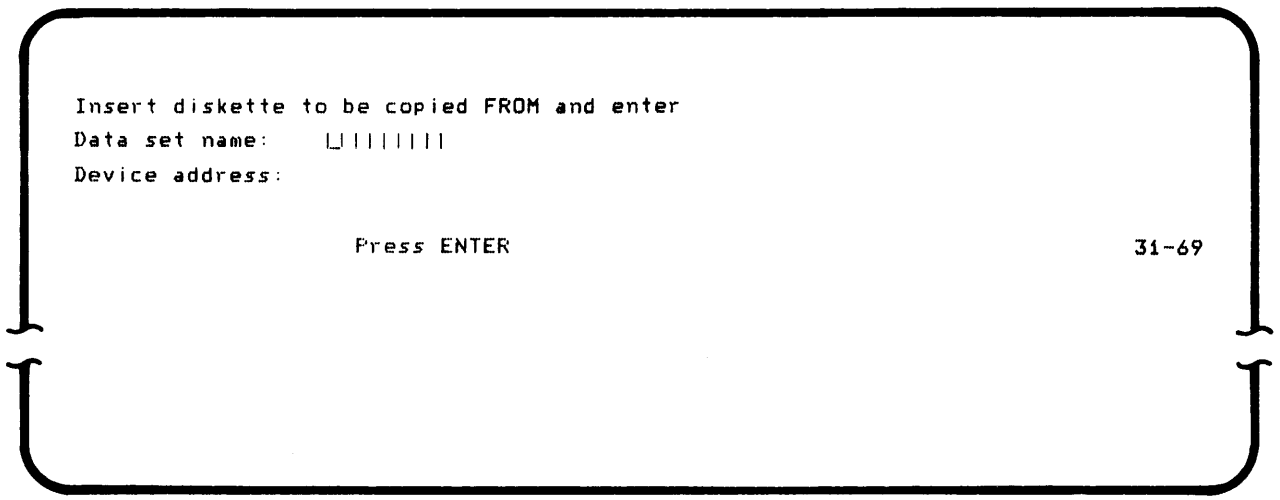
The copy in process prompt (31-77) is redisplayed.

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.

Insert Input Diskette (31-69)

If you enter option 6 in the select copy option prompt (31-01), the following prompt is displayed:



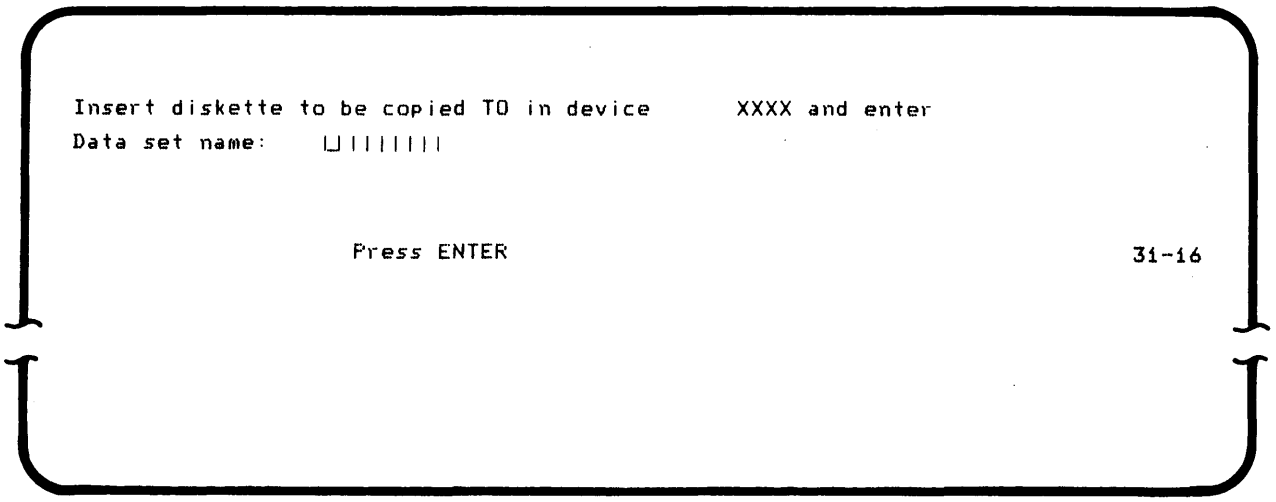
1. Insert the input diskette into a diskette drive.
2. Enter the name of the data set to be copied and the address of the diskette drive.
3. Press the Enter key.

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:



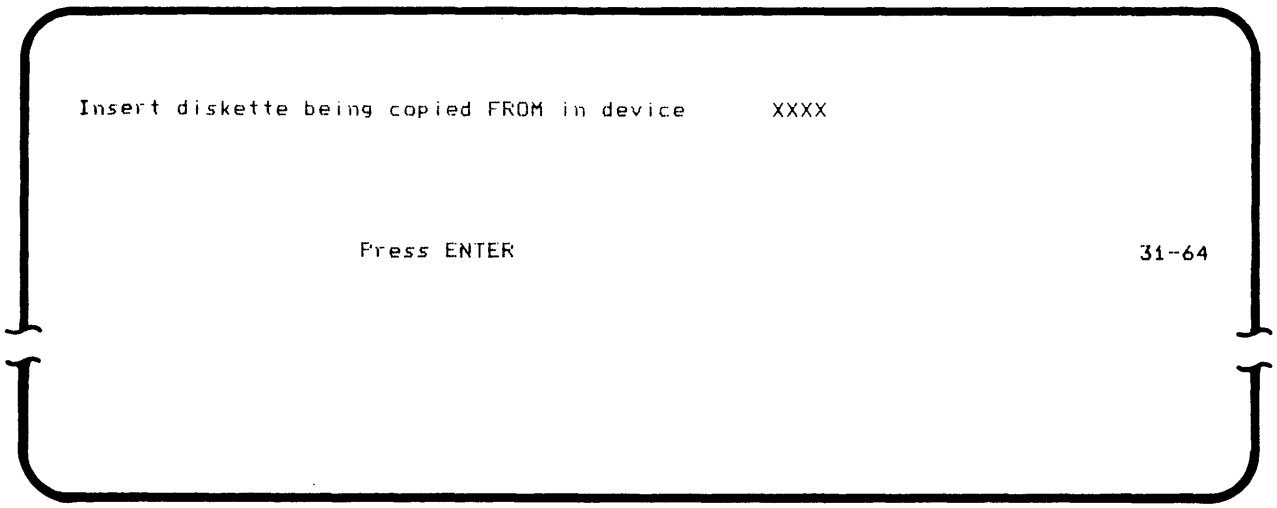
1. Insert the output diskette at the address in the field indicated by the Xs.
2. Enter the name of the output data set.
3. Press the Enter key.

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:

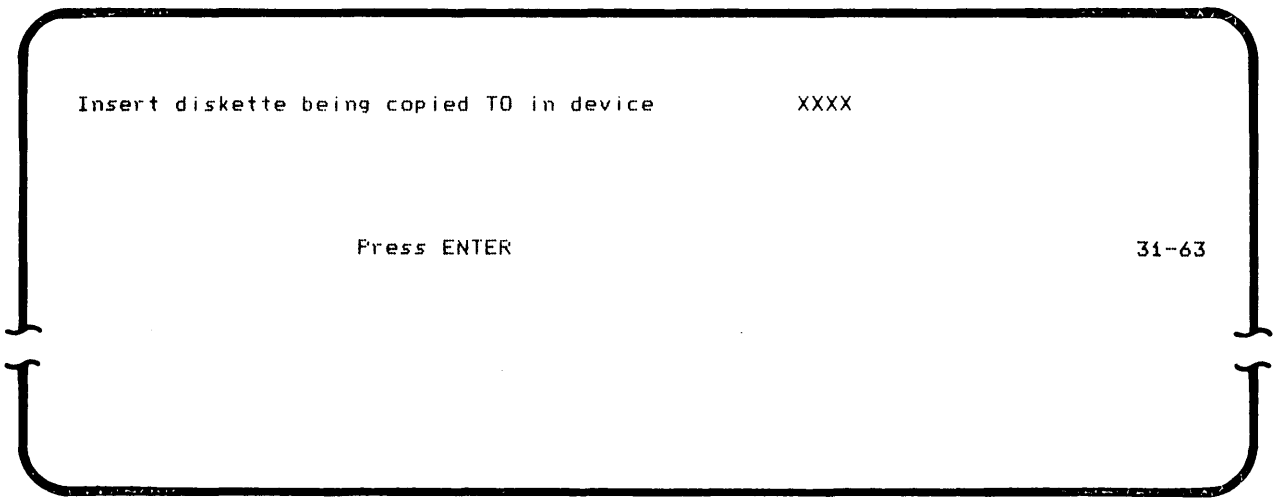


1. Insert the input diskette at the address in the field specified by the Xs.

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)



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 Diskette Print Utility

The print utility prints a single data set or all data sets on a diskette. Four print functions are available.

- Diskette print. All the data sets on a diskette are printed.
- Data set print. A single data set is printed. Multivolume data sets are supported for this print function.
- 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.

Two format-control methods are available.

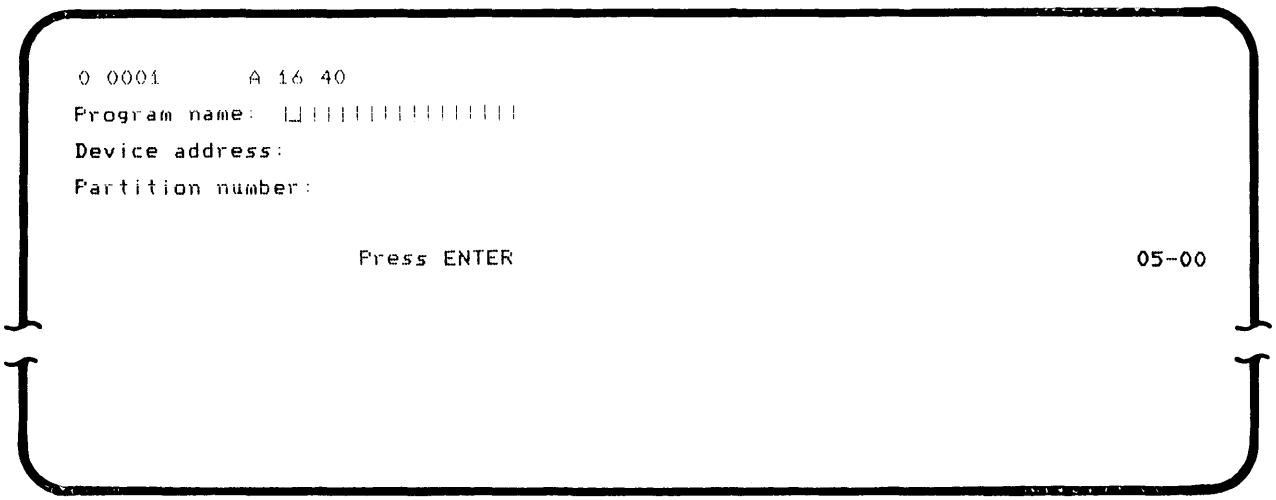
- Print by record. A new line is started for each record. The format for specify record print and specify key print automatically defaults to the print by record format. The following printer control information is prompted for:
  - The number of characters to print per line
  - The page size (in terms 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 print or a data set print. This type of print control cannot be used with ASCII diskettes.

From 10 to 198 characters per line can be printed, and from 1 to 255 lines per page can be printed.

Operation of the Print Utility

Load the Print Utility (05-00)

To load the utility, respond to the following prompt:

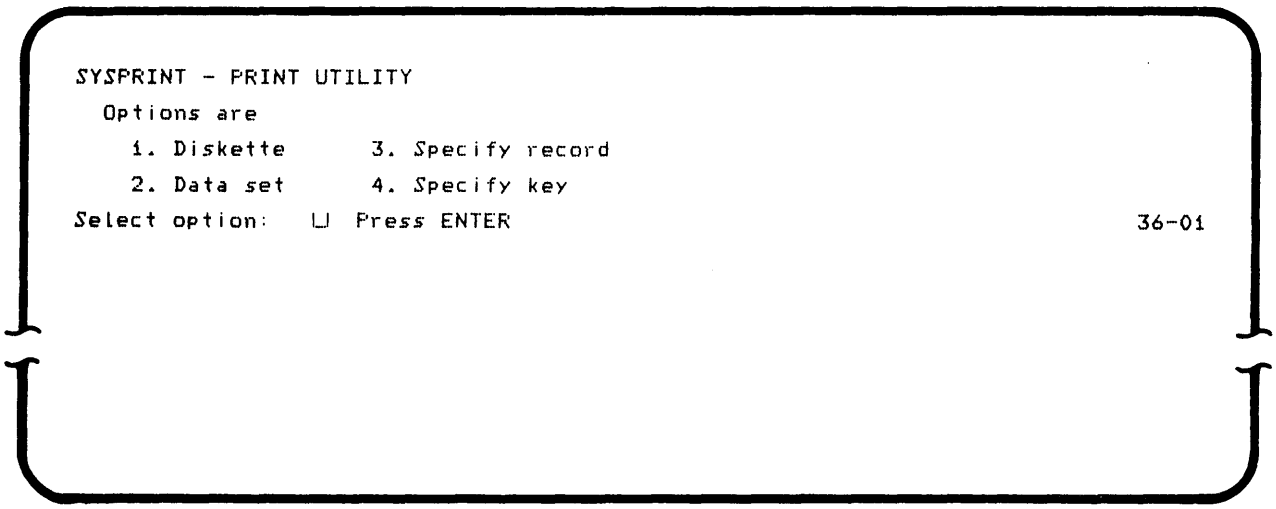


1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYSPRINT as the name of the program to be executed.
3. Enter the device address of the diskette drive where the utility diskette is inserted.
4. Enter the number of the partition where the utility will be loaded. (If a partition 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 print option prompt (36-01) is displayed.

Specify the Print Option (36-01)

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



1. Select a print option:

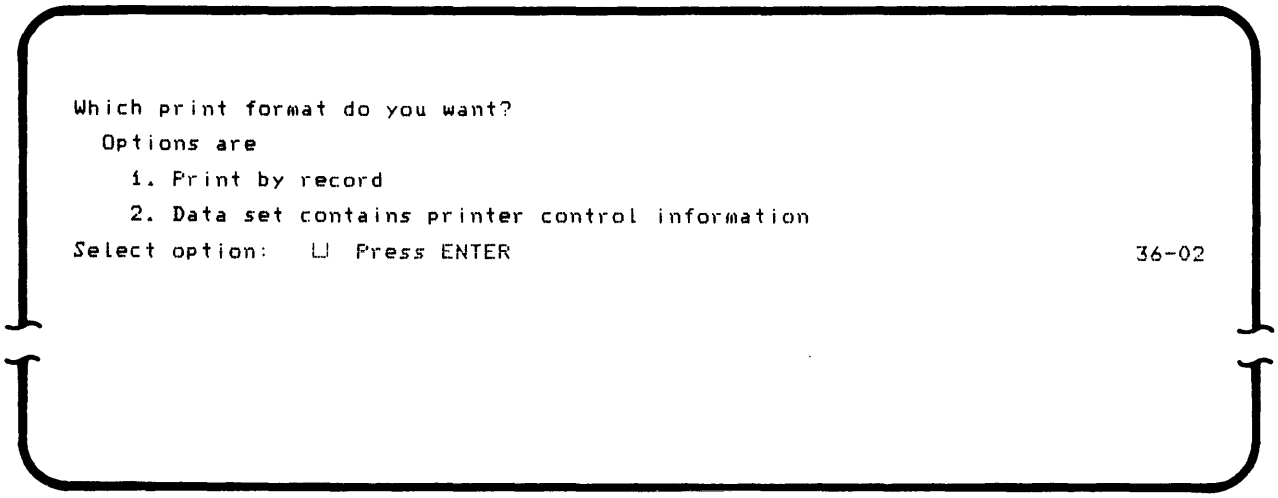
   - Enter a 1 to print all the data sets on a diskette.
   - Enter a 2 to print all the records in one data set.
   - Enter a 3 to print records in a data set by specifying the relative record numbers of the first and last records to be printed.
   - Enter a 4 to select records for printing based on the values of certain fields (keys) in the records.

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 or 4, the input data set prompt (36-04) is displayed. (The print format method will always be print by record for option 3 or 4.)

Specify the Print Format to be Used (36-02)

If you specify diskette print or data set print (option 1 or 2 in prompt 36-01), the following prompt is displayed:



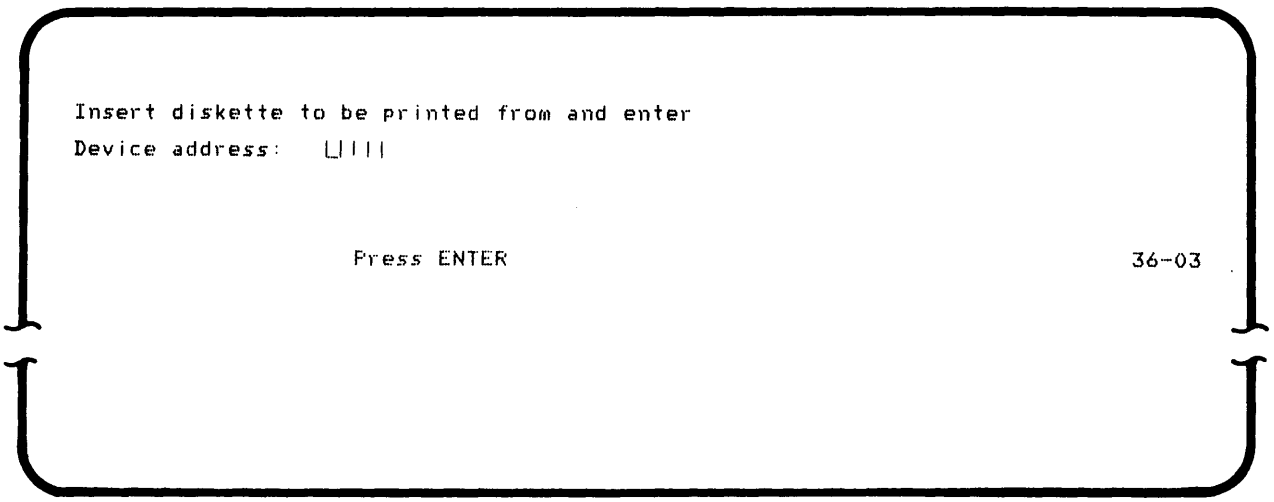
1. Select an option.
2. Press the Enter key.

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 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 print, the following prompt is displayed:

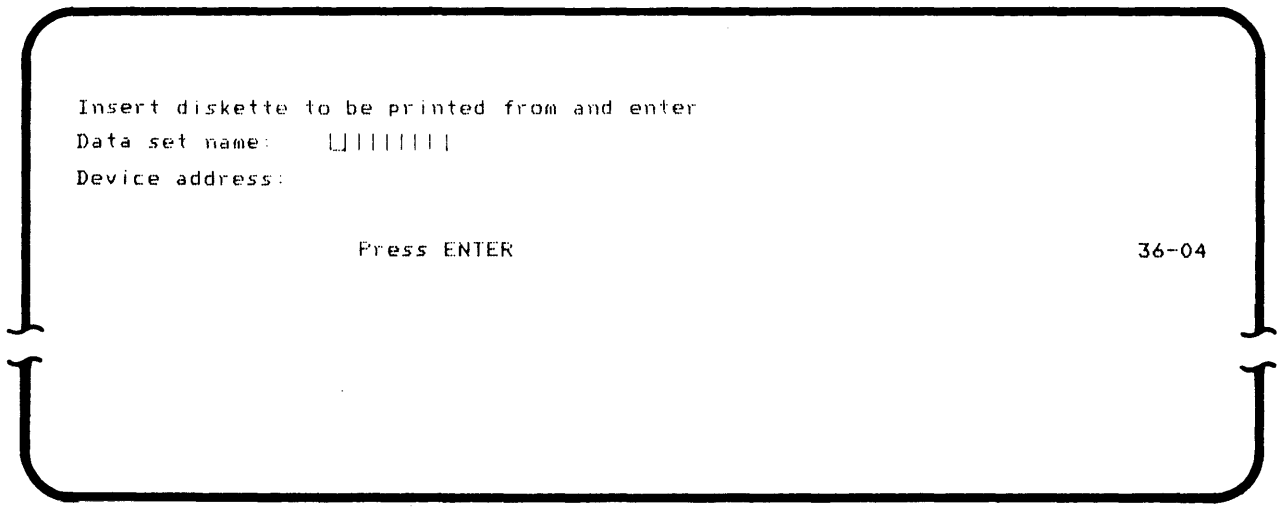


1. Insert the input diskette into a diskette drive.
2. Enter the address of the diskette drive.
3. Press the Enter key.

If the input diskette is volume-protected, the volume-protected prompt is displayed. Enter the owner ID to continue. After you access the diskette, the specify printer prompt (36-08) is displayed.

Input Data Set (36-04)

For a data set print, specify record print, or specify key print, the following prompt is displayed:



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 must contain the next sequential volume.

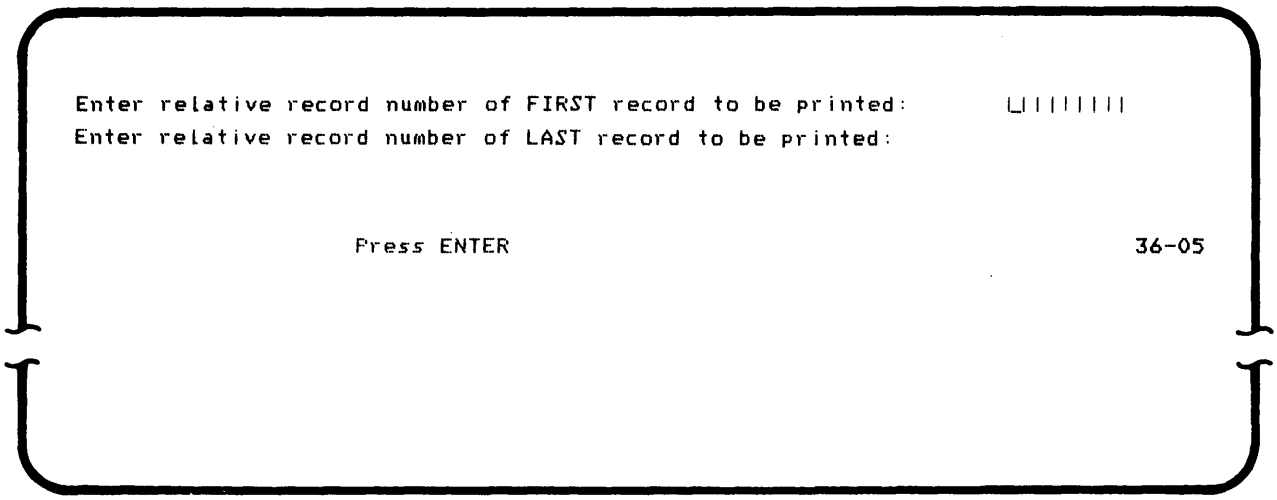
1. Insert the input diskette into a diskette drive.
2. Enter the name of the data set to be printed and the device address of the diskette drive.
3. Press the Enter key.

If the diskette is volume-protected, the volume-protected prompt is displayed. Enter the owner ID 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, 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 print, the following prompt is displayed:



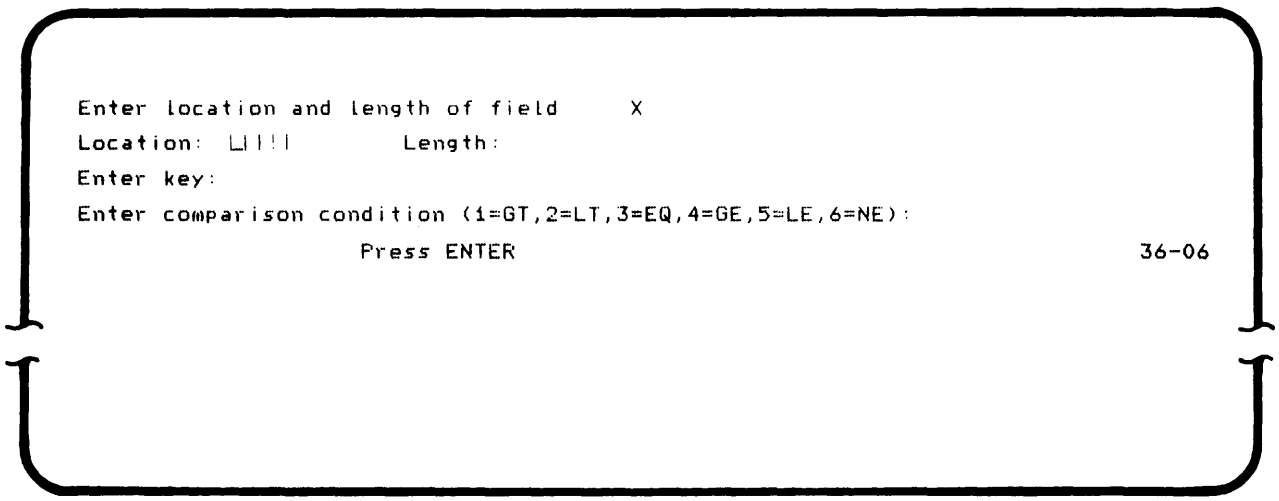
1. Enter the relative record numbers of the first and last records to be printed. If blanks are entered for the last record to be printed, the system will print all the remaining records in the data set.

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:



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)

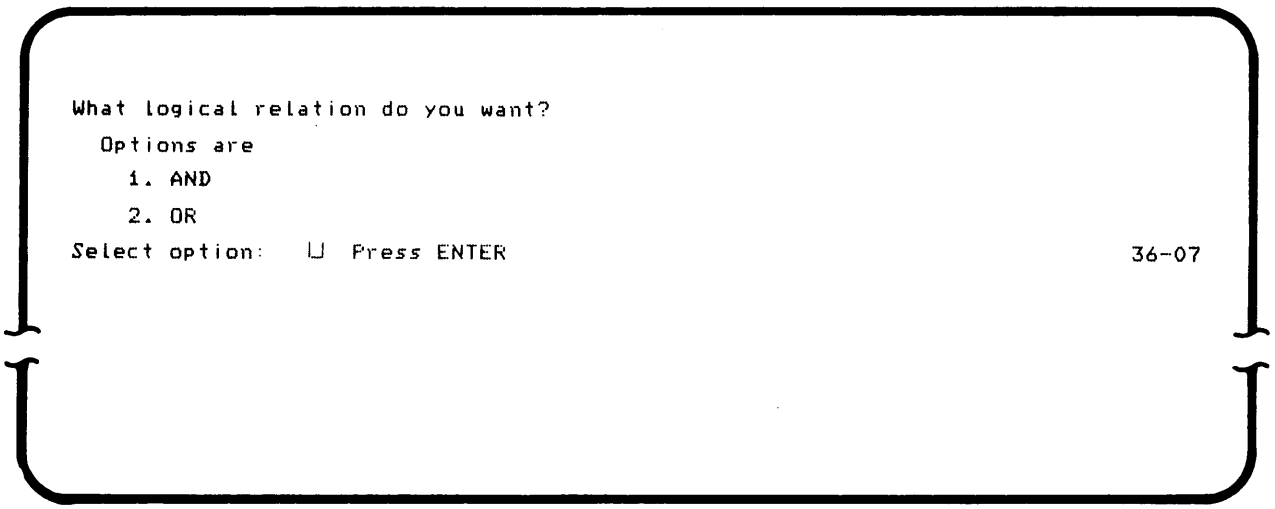
4. Press the Enter key.

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 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:



1. Enter a 1 to specify an AND relation. Or enter a 2 to specify an OR relation.

2. Press the Enter key.

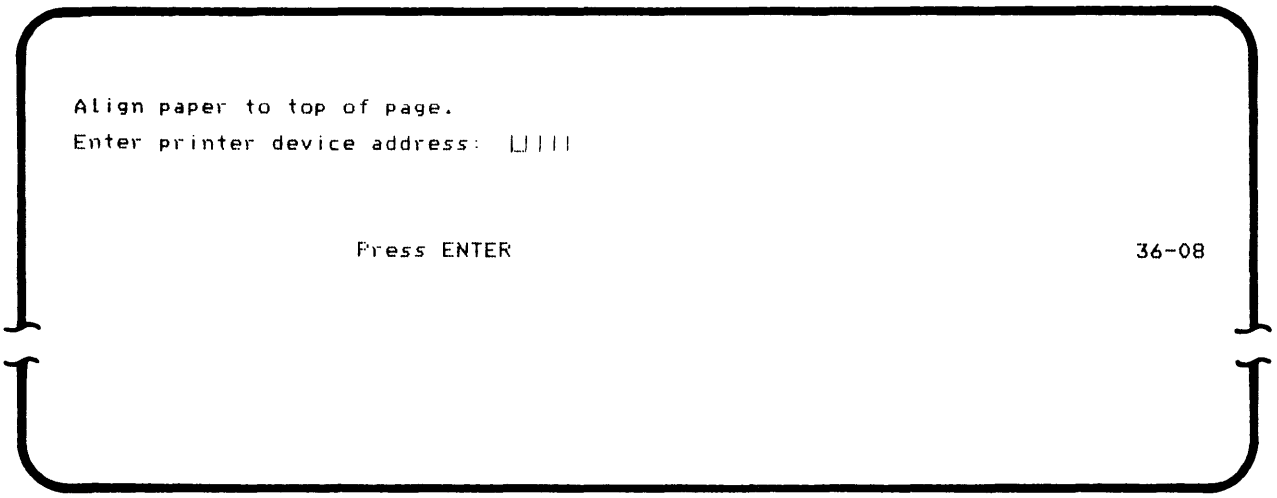
An AND relationship indicates that *all the fields specified* must satisfy the comparison condition for the record to be printed.

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.

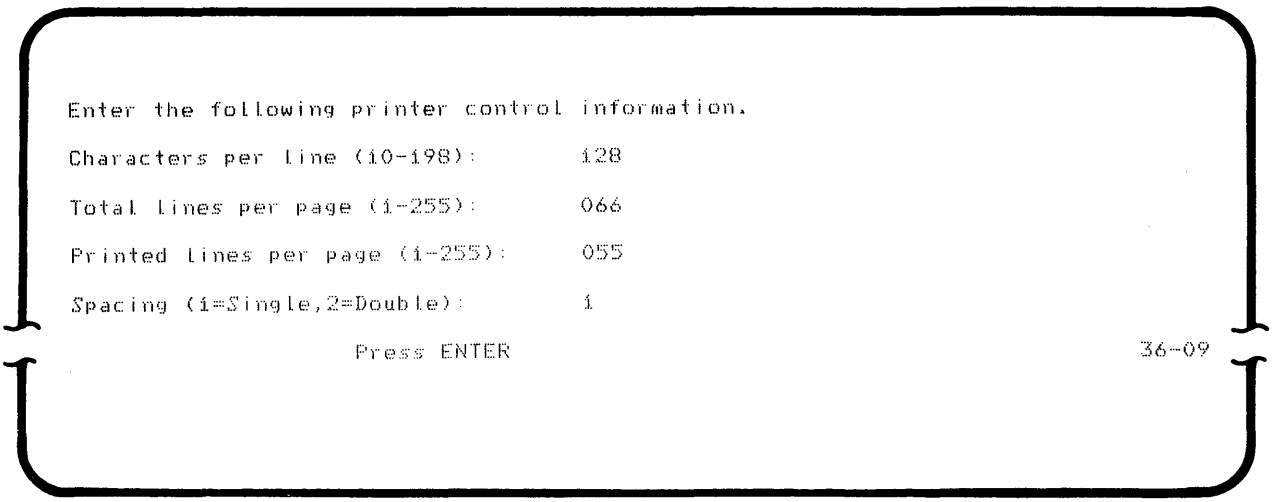
3. Enter the device address of the printer that will print the data.

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, 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:



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.

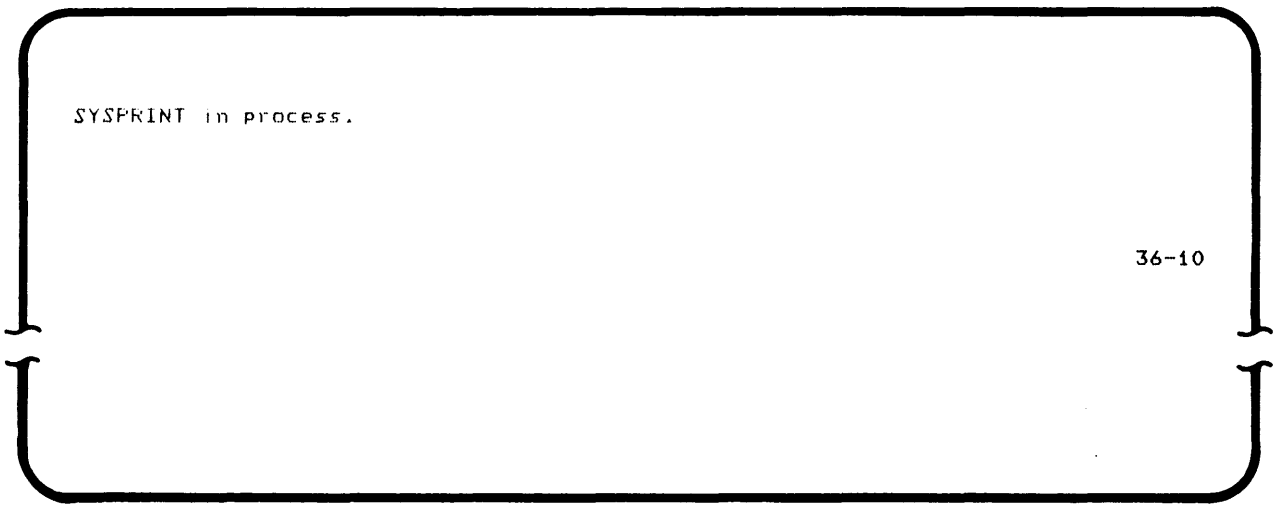
   The number of characters per line should never be greater than the print width of your printer. Double spacing must not be specified if the total lines per page is 1. Whether double spacing or single spacing is used, the printing always begins on the first line of each page.

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:

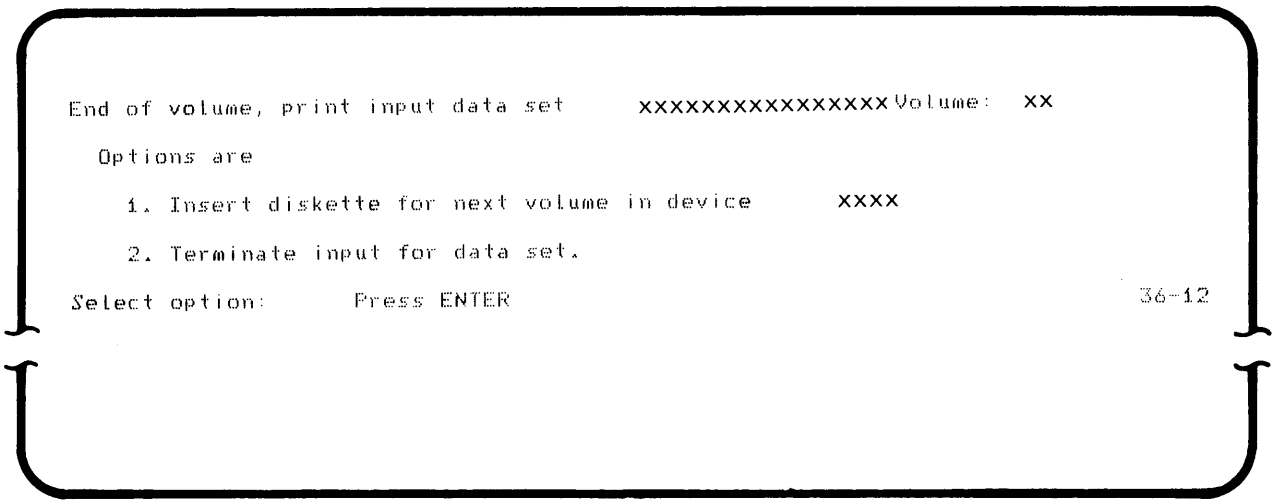


This message is displayed until the printing is completed. Then the utility-completed prompt (36-78) is displayed except for the following conditions:

- For a diskette 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:

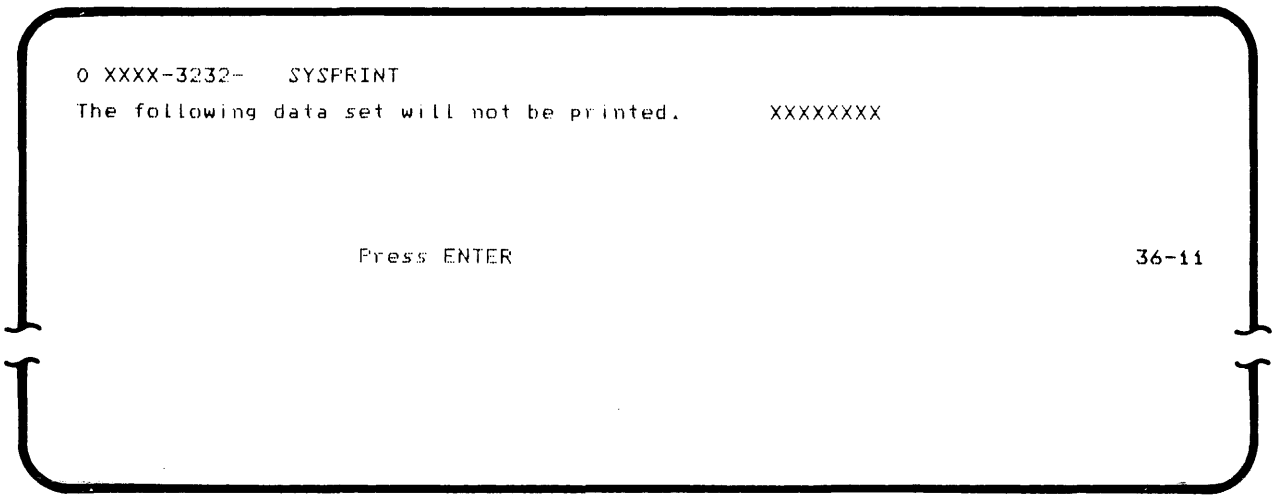


If you do not want to print other volumes of the data set, enter 2 and press the Enter key. The utility-completed prompt (36-78) is displayed.

If you want to print other volumes, insert the diskette containing the next sequential volume into the diskette drive specified in the prompt. 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 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 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:



No entry is required. Press the Enter key to continue printing 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 from the utilities diskette 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 from the utilities diskette 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.

Chapter 7. The Diskette/Data Set Clear Utility

The diskette/data set clear utility can drop or free a single data set or the entire contents of a diskette. For example, you can write confidential data on a diskette, obtain the desired results, then use the clear utility to drop or free the data from the diskette. 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 drop: This option functions the same as data set drop but applies to all the data sets on the diskette. Although the data is no longer accessible, the labels remain usable with the same data set names.

- Diskette free: This option functions the same as data set free, except that all the labels and data on the diskette are deleted. All the diskette space is freed and can be reallocated for future use.

With each clear option, you can also replace the data with hexadecimal zeros.

Terminating the Utility with the Cmd, End of Job Key Sequence

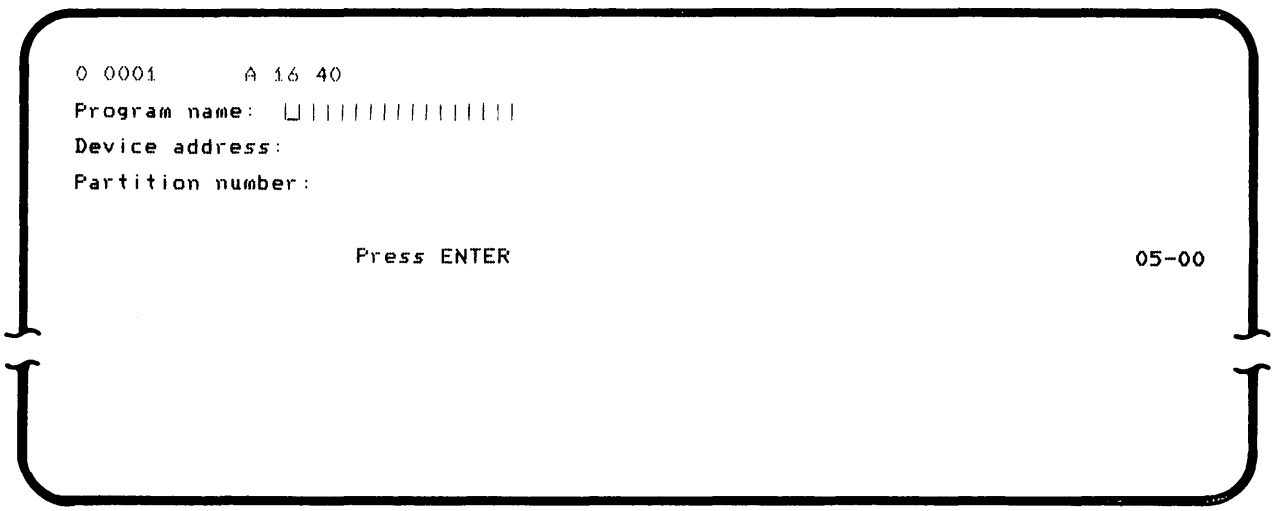
If you terminate the utility by using the Cmd, End of Job key sequence while the utility is clearing a data set, a termination-in-process prompt is displayed. This prompt remains displayed until the data set currently being cleared is completely cleared; then the utility-terminated prompt (25-79) is displayed. Usually the clearing process takes only a few seconds. However, the process takes longer if you are clearing a very large data set and you are replacing the data with hexadecimal zeros. In this case, you should reinitialize the diskette rather than clear the data set(s).

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 are cleared.

Operation of the Clear Utility

Load the Clear Utility (05-00)

To load the utility, respond to the following prompt:



1. Insert the diskette containing the utility into a diskette drive.

1. Enter SYSCLEAR as the program name.

3. Enter the device address of the diskette drive.

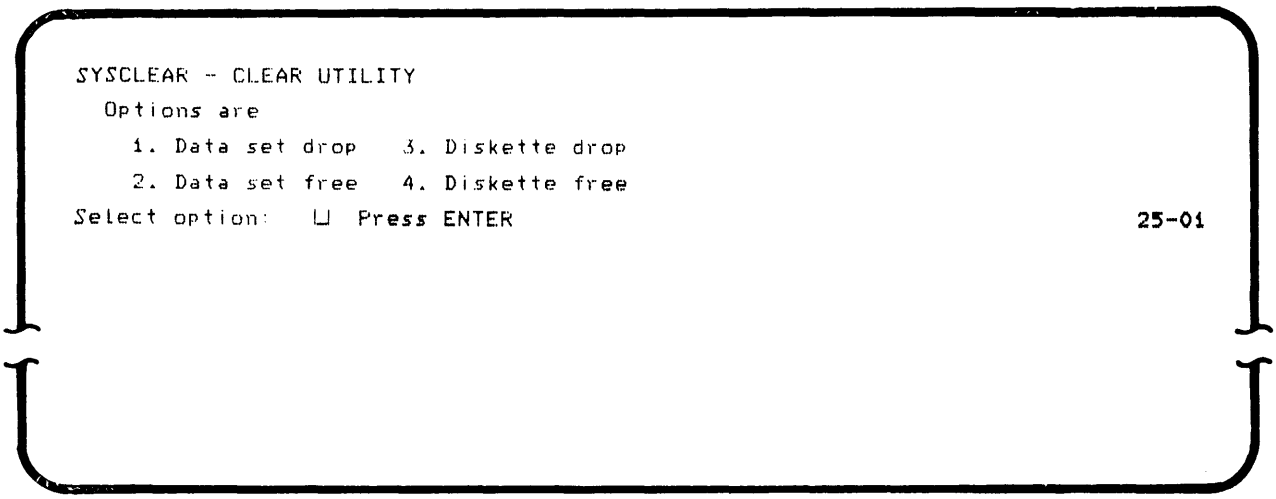
4. Enter the number of the partition where the utility will execute. (If a partition number is not entered, the number defaults to the number of the partition associated with the keyboard at which you are working.)

5. Press the Enter key.

The utility is loaded, and the specify clear option prompt (25-01) is displayed.

Specify the Clear Option (25-01)

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



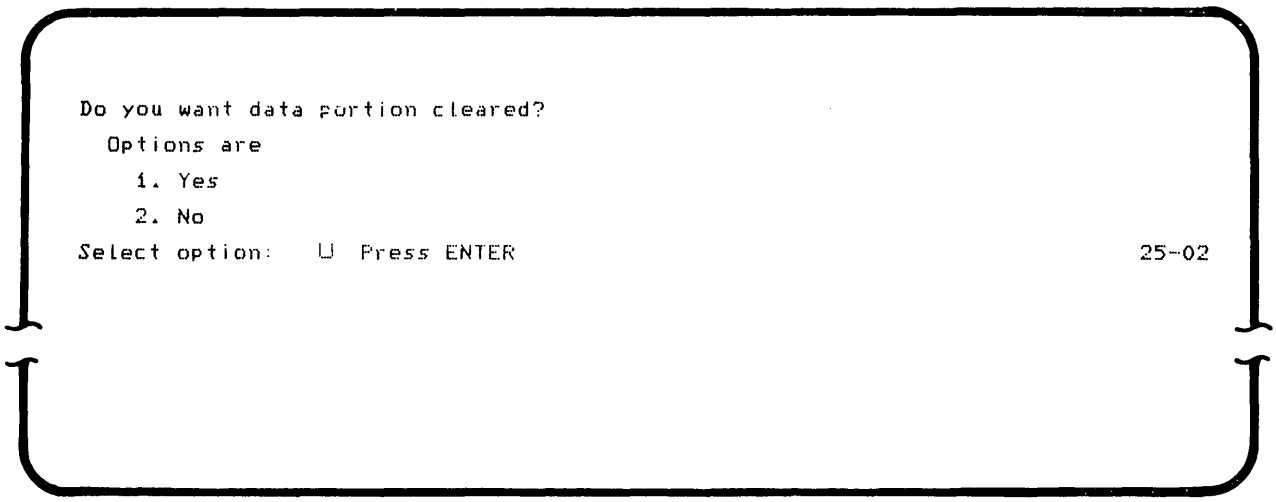
1. Select an option:

   - 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 the data set labels so the space remains allocated for all the data sets but contains no data.
   - Enter a 4 to delete both the data set labels and the data in all the data sets on the diskette. 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)



1. Select an option:

   - If you specify yes, all the character positions in the data set are reset to hex 00. This option should be used for data security reasons only, because this process takes considerable time to execute.

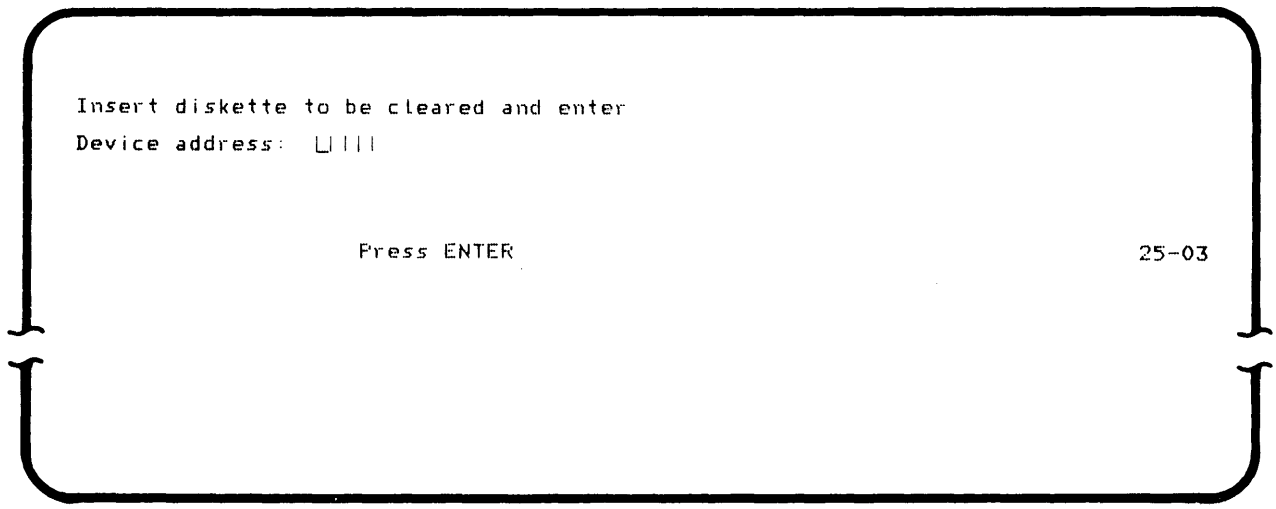
   - If you specify no, the character positions remain unchanged.

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 drop or free, the insert diskette prompt (25-03) is displayed.

Insert the Diskette to be Cleared (25-03)

For a diskette drop or free (option 3 or 4 in prompt 25-01), the following prompt is displayed:



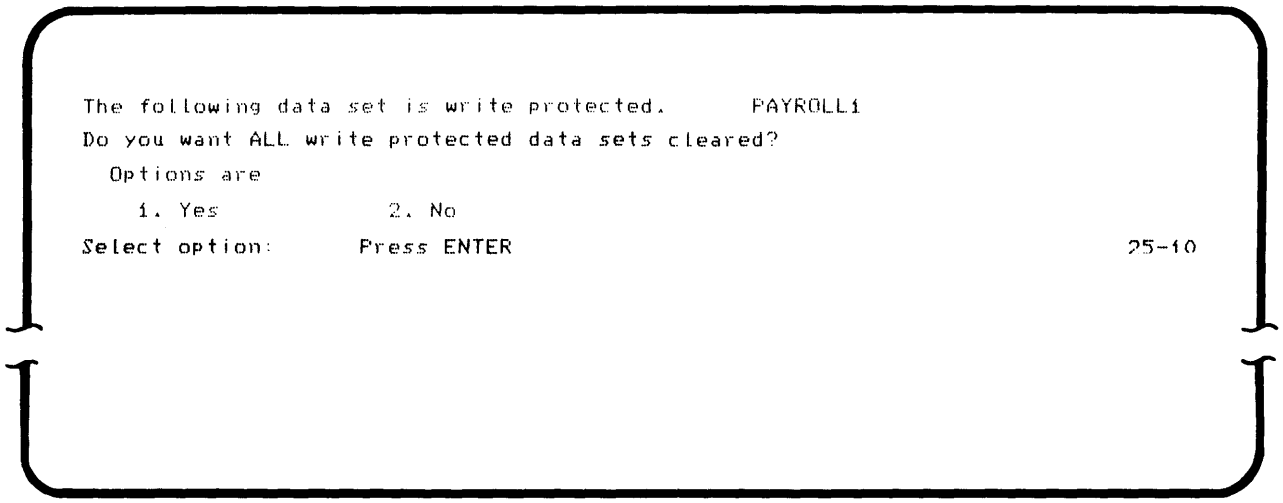
1. Insert the diskette containing the data sets to be cleared.
2. Enter the device address of the diskette drive.
3. Press the Enter key.

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

If the first data set on the diskette is unexpired, the diskette has unexpired data sets prompt (25-11) is displayed. If the first data set on the diskette is write-protected, the diskette has write-protected all (25-10) is displayed. Otherwise, the diskette clear in process prompt (25-07) is displayed.

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.



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.

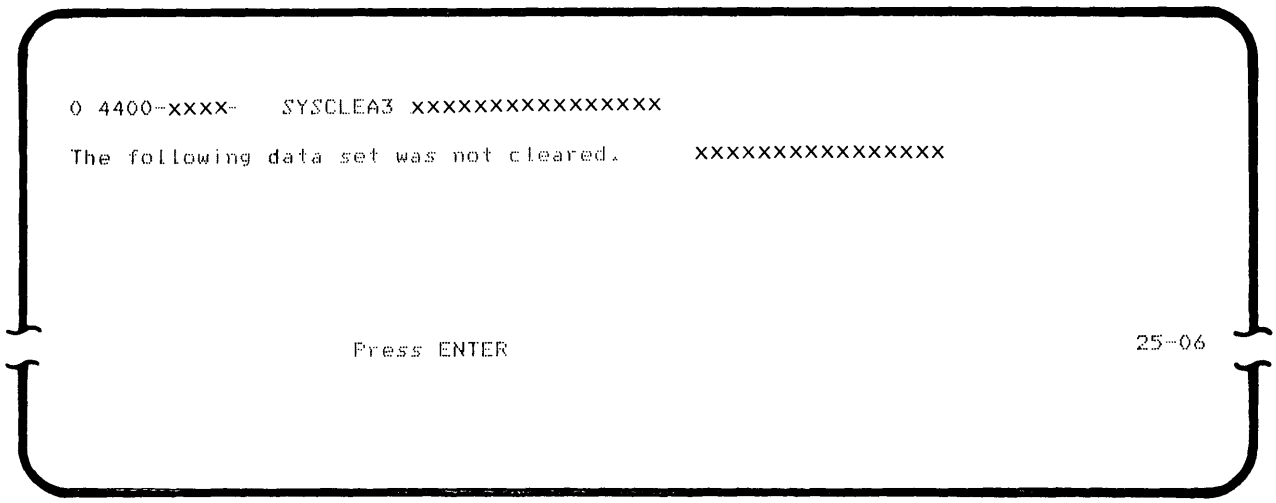
```
The following data set is unexpired.          PAYROLL2
Do you want ALL unexpired data sets cleared?
  Options are
    1. Yes          2. No
Select option:     Press ENTER                                    25-11
```

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)

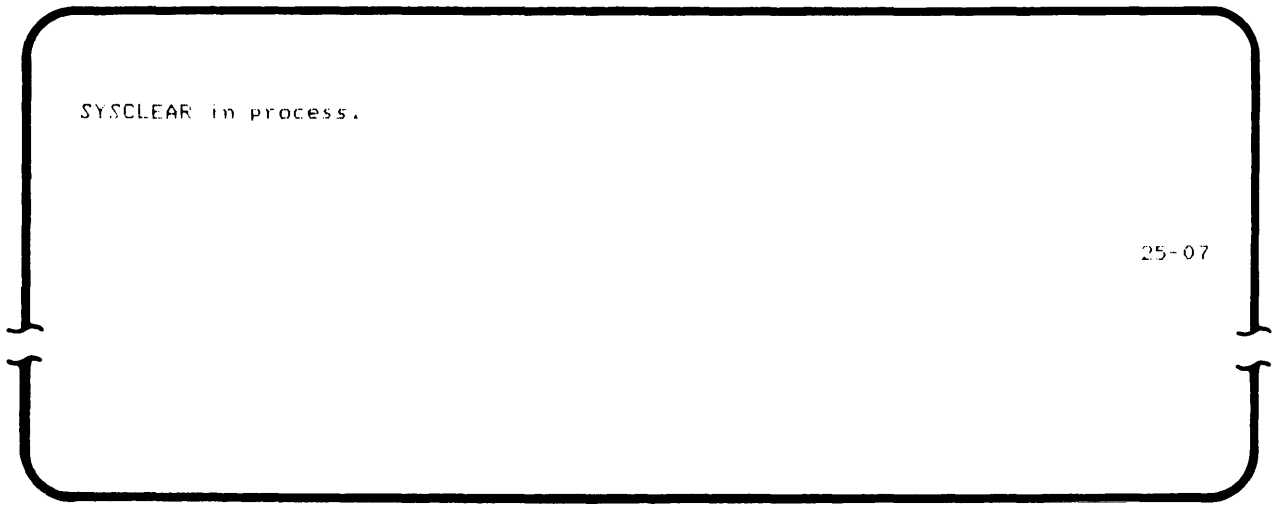


Press the Enter key. The utility continues and the clear in process prompt (25-07) is displayed.

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, and the clear in process prompt (25-07) is redisplayed.

Diskette Clear in Process (25-07)

While the data sets are being cleared from the diskette, the following prompt is displayed:



If a write-protected data set is encountered after the diskette clear begins, the diskette has write-protected data set prompt (25-10) is displayed.

If an unexpired data set is encountered after the diskette clear begins, the diskette has unexpired data sets prompt (25-11) is displayed.

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.

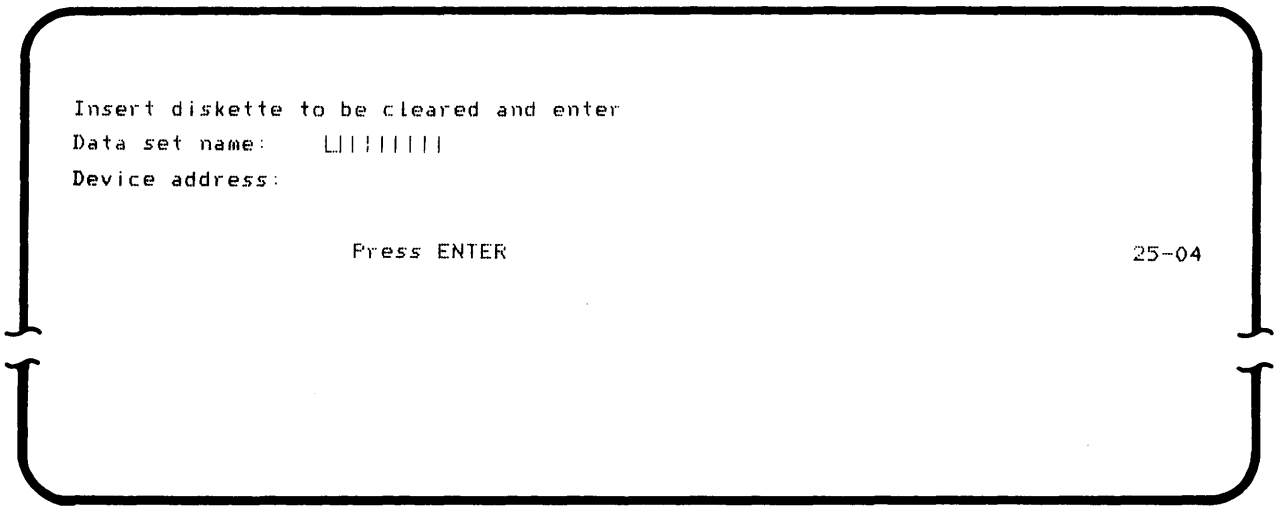
Utility Completed (25-78)

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:



1. 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 of the diskette drive.
4. 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 to continue.

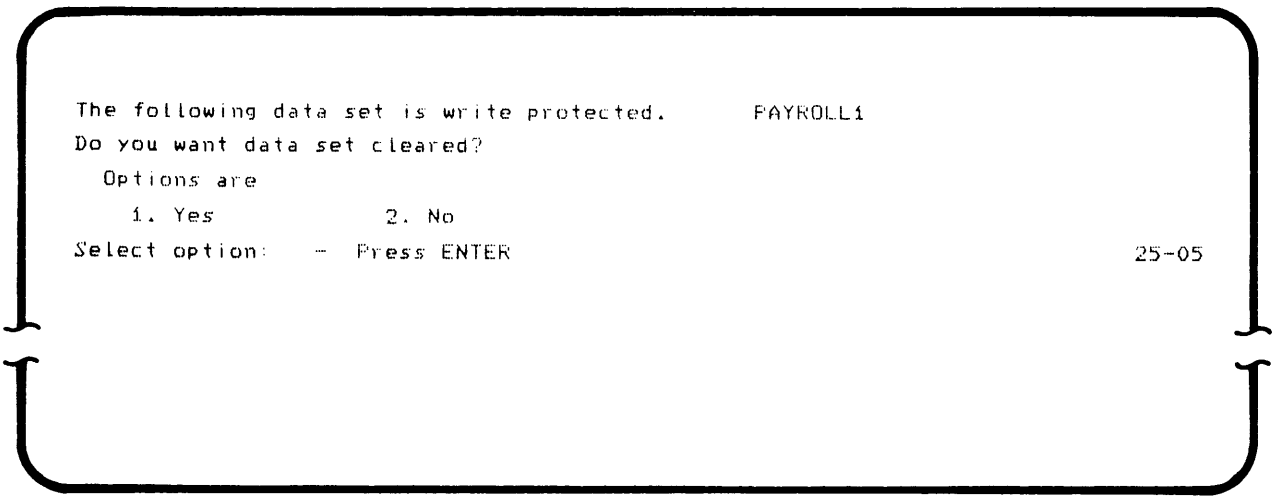
If the data set is write-protected, the write-protected prompt (25-05) is displayed.

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:



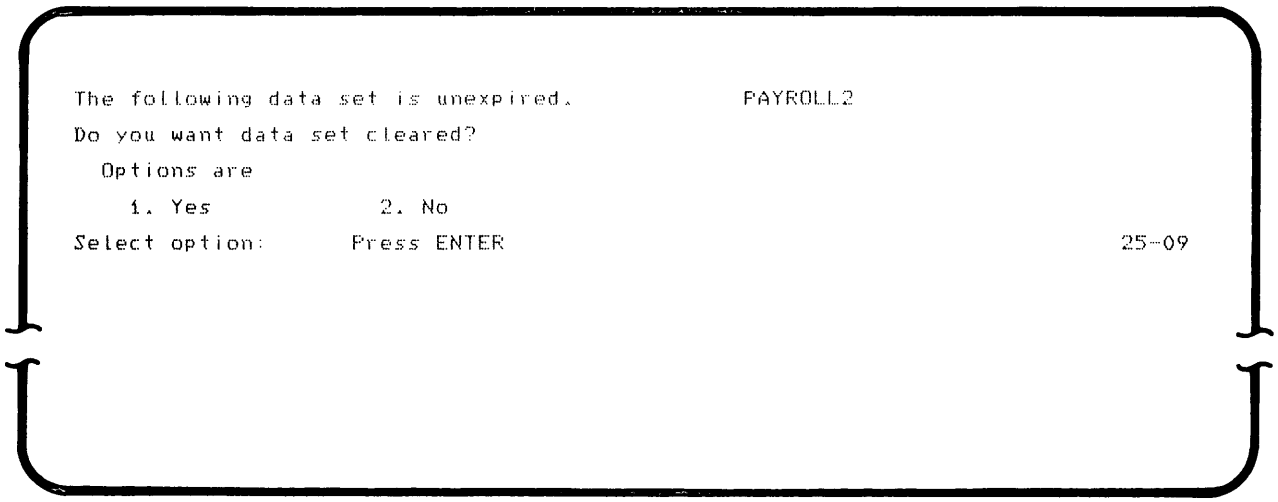
1. Select an option.
2. Press the Enter key.

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 not cleared prompt (25-06) is displayed.

Data Set Unexpired (25-09)

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

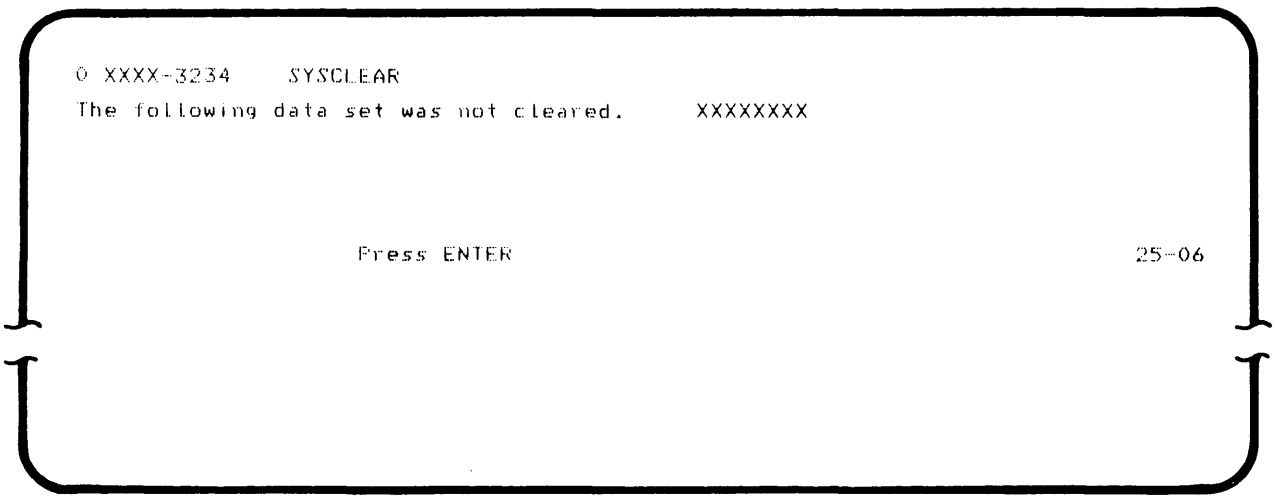


1. Select an option.
2. Press the Enter key.

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 (25-01) is displayed.

If you select option 2, the data set not cleared, prompt (25-06) is displayed.

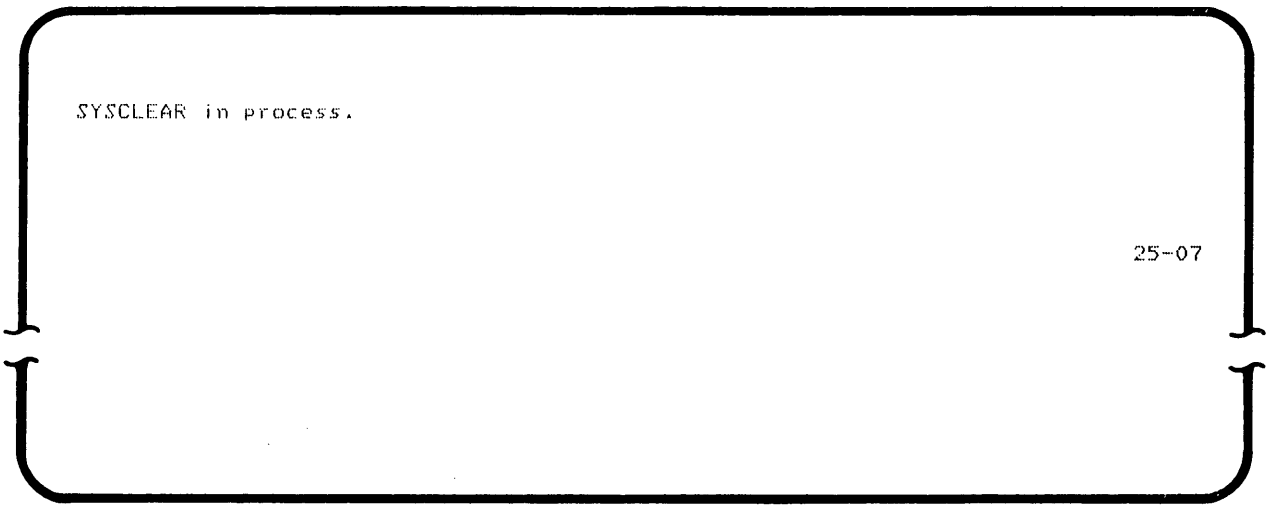
Data Set Not Cleared (25-06)



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 Diskette Initialization Utility

The diskette initialization utility initializes diskettes. 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 ERMAP 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.

	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
	4	2	26	52	128	01-13	492 544
Diskette 2	5	2	15	30	256	01-08	568 320
	6	2	8	16	512	01-04	606 208
	7	2	26	52	256	01-13	985 088
Diskette 2D	8	2	15	30	512	01-08	1 136 640
	9	2	8	16	1024	01-04	1 212 416

You can use the diskette 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 9. 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

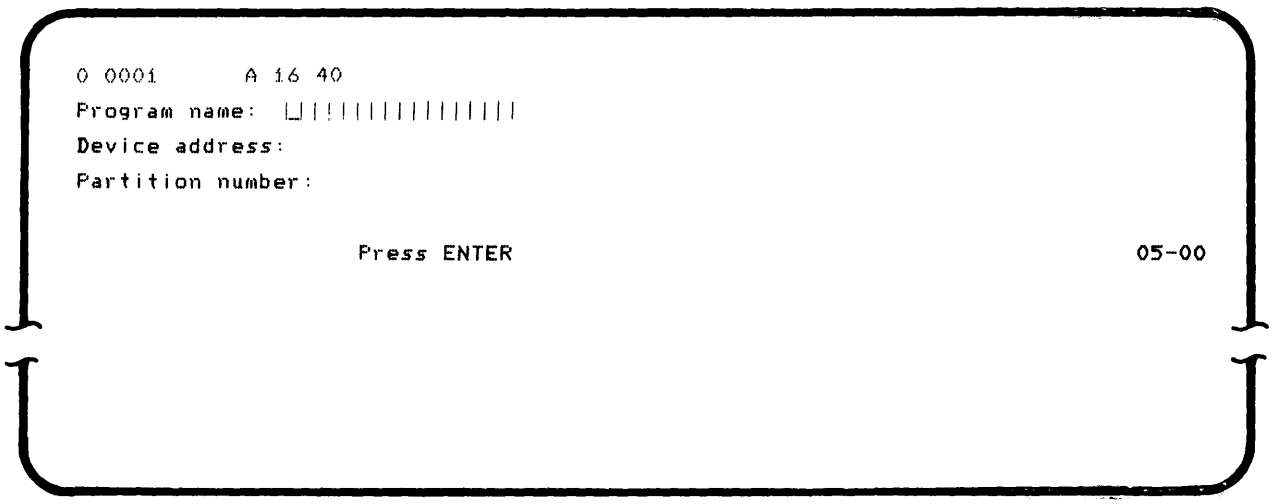
ASCII AND EBCDIC DISKETTES

The 5280 normally records diskettes using EBCDIC (extended binary coded decimal interchange code). Other codes cannot be read or written by the 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.

Operation Of The Initialization Utility

Load the Utility (05-00)

To load the utility, respond to the following prompt:

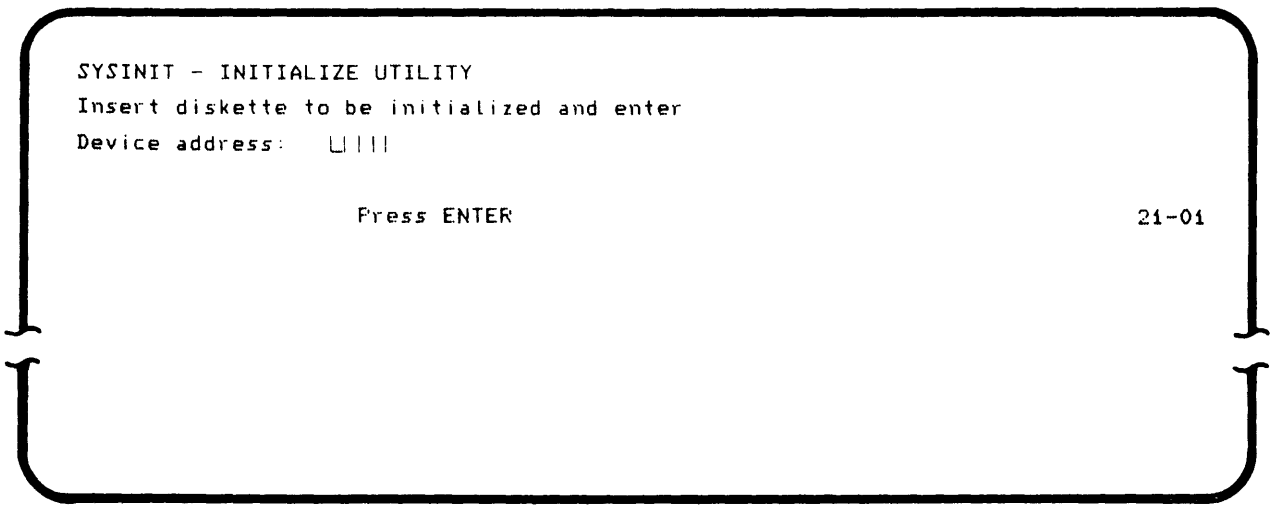


1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYSINIT as the program name.
3. Enter the device address of the diskette.
4. Enter the number of the partition where the program will execute. (If the number of the partition is not entered, the number defaults to the number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

The utility is loaded, and the insert diskette prompt (21-01) is displayed.

Insert the Diskette to be Initialized (21-01)

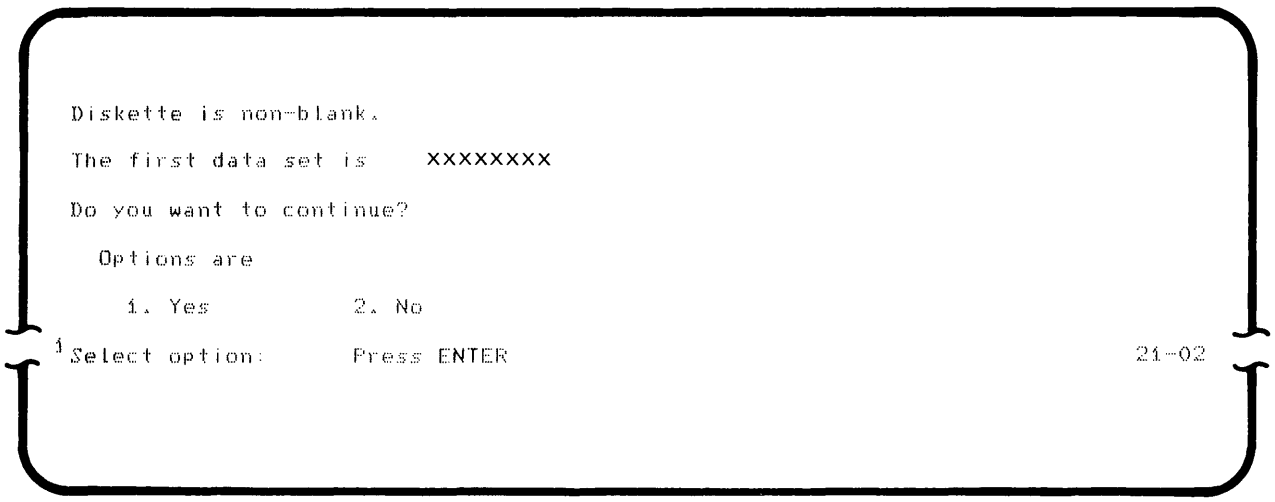
After the utility is loaded, the following prompt is displayed:



1. 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 to be intialized. If the diskette contains allocated data sets, the initialize nonblank diskette prompt (21-02) is displayed.

Initialize Nonblank Diskette (21-02)



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

The preceding prompt warns that the diskette to be initialized might contain data. *If you continue the initialization, all data on the diskette will be lost.* If you do not continue, prompt 21-01 is displayed again to allow insertion of another diskette.

Note: If you are unsure of the contents of the diskette, use the diskette label list utility and display the contents of the diskette header. See Chapter 4, *The Diskette Label List Utility*.

Specify EBCDIC or ASCII (21-03)

The following prompt is displayed only if the ASCII translate table was loaded from the IPL diskette.

```
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:

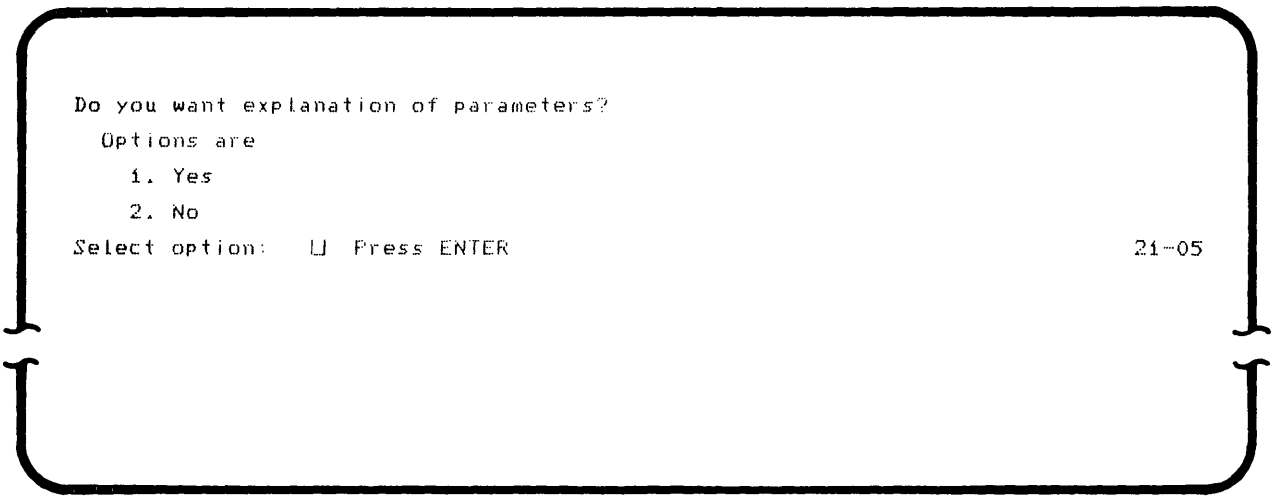
```
Do you want to initialize diskette using same parameters?
  Options are
    1. Yes
    2. No
Select option:    ↵ Press ENTER                                    21-04
```

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, the following prompt is displayed:

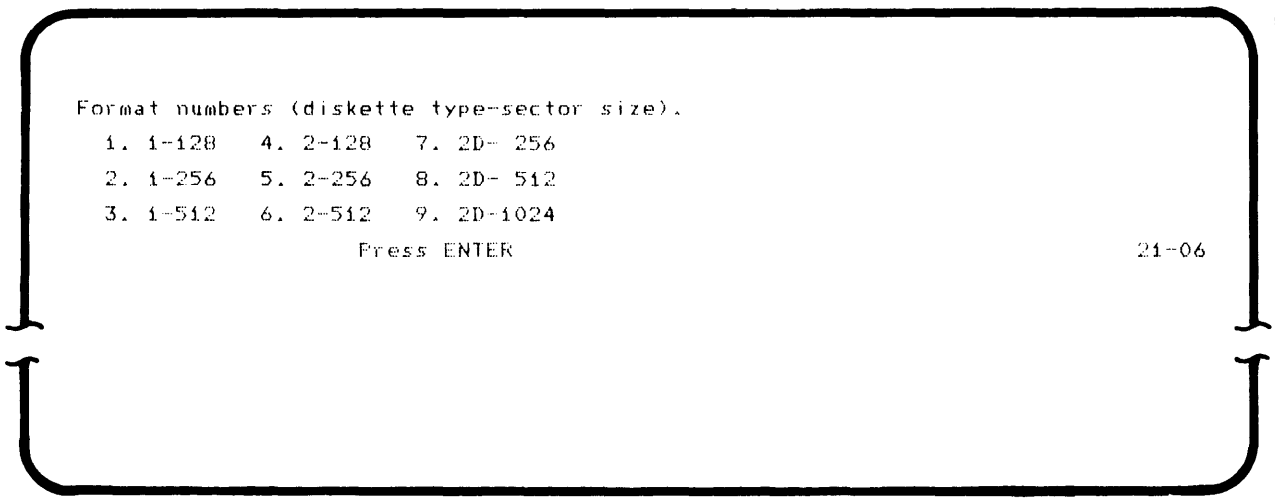


1. Select an option.
2. Press the Enter key.

If you enter a 2, the initialization parameters prompt (21-08) is displayed.

If you enter a 1, the first explanation prompt (21-06) is displayed.

Explanation of Format Number, Diskette Type and Sector Size (21-06)



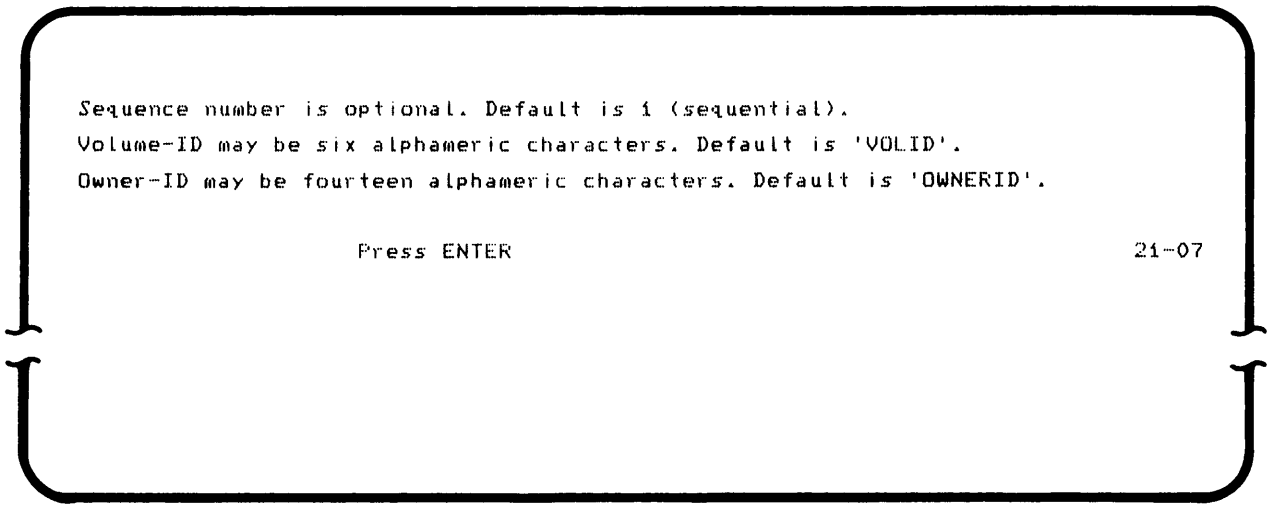
The preceding message is informational only. However, because you must enter a format number later (and possibly make other entries), please note the number of the format to be used in initializing the diskette.

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)



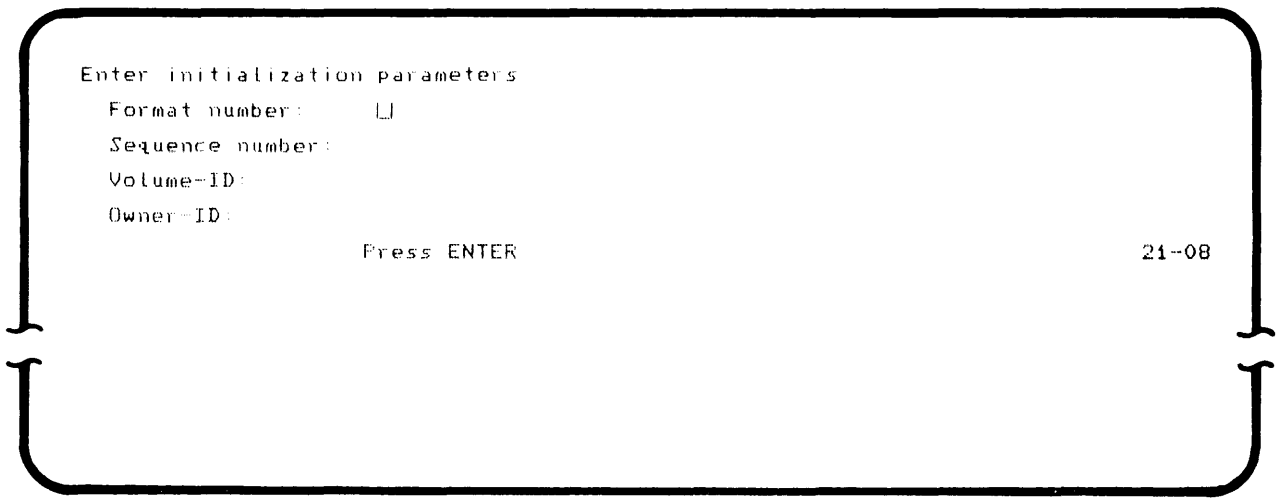
The preceding message explains the initialization parameters. The information in the explanation prompts (21-06 and 21-07) can be used to respond to the initialization parameters prompt (21-08). You might want to make a note of the information in the preceding prompt.

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:



1. Select the format number. The format number 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.

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* in this chapter). 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.

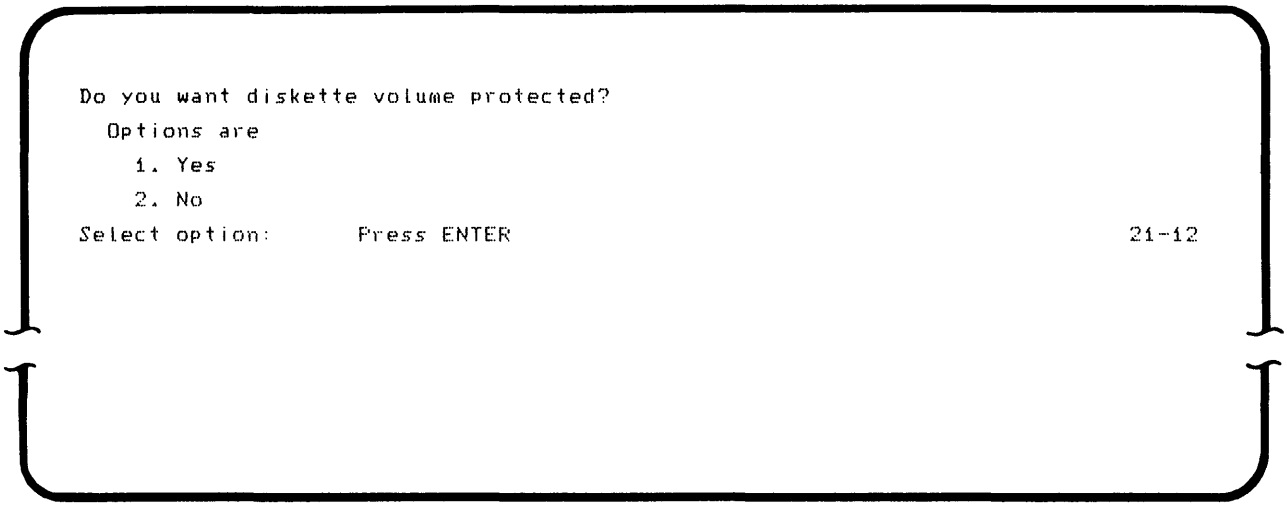
3. Enter a volume ID (diskette name). Up to six alphameric characters can be used for the name. If you do not enter a volume ID, this name defaults to VOLID.

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, the additional labels prompt (21-09) is displayed followed by a prompt 21-12. If you are not initializing a diskette 2D, a prompt 21-12 is displayed.

Do You Want Diskette Volume Protected (21-12)

Specify whether you want the diskette volume protected by selecting one of the options below.



If you enter a 1 or 2 and press Enter, prompt 21-10 is displayed. If any other value is entered, an error is displayed.

Specify Additional Data Set Labels for Diskette 2D (21-09)

If you are initializing a diskette 2D, after you specify the initialization parameters, the following 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
```

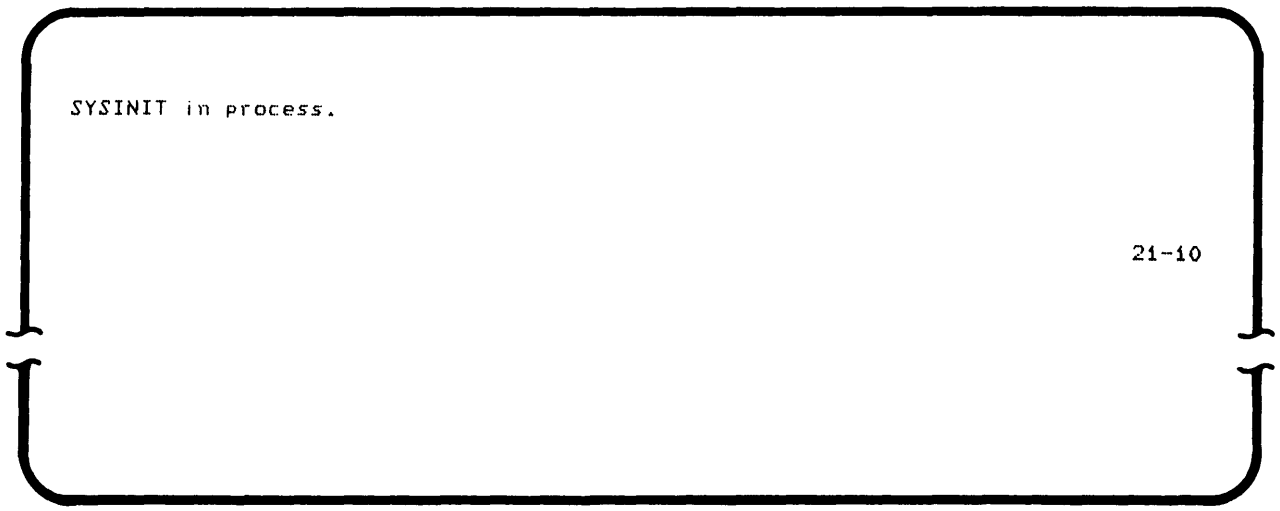
Note: The performance of a diskette may be affected when more than 71 labels are specified.

1. Enter the option number corresponding to the number of labels to be written on the diskette. If you do not want additional labels on the diskette, do not make an entry.

2. Press the Enter key.

The initialization process begins, and the initialization in process prompt (21-10) is displayed.

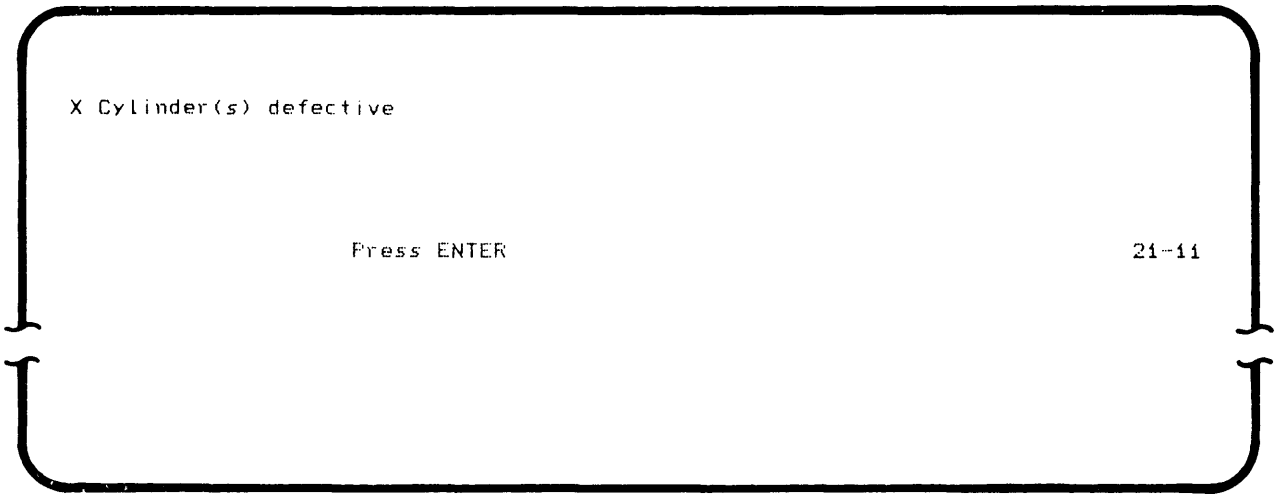
Initialization in Process (21-10)



This prompt remains displayed until the initialization process is completed or terminated. If the 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.

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, the insert diskette prompt (21-01) is displayed.

Chapter 9. The Resource Allocation Utility

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.

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 diskette 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 diskette 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 data 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 diskette 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 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/or the device address, and write the changes to the current IPL diskette (the diskette containing your system configuration); use the same IPL diskette and perform the IPL process for the system. Once the IPL process is complete, the permanent changes are made to the table on the IPL diskette.

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.

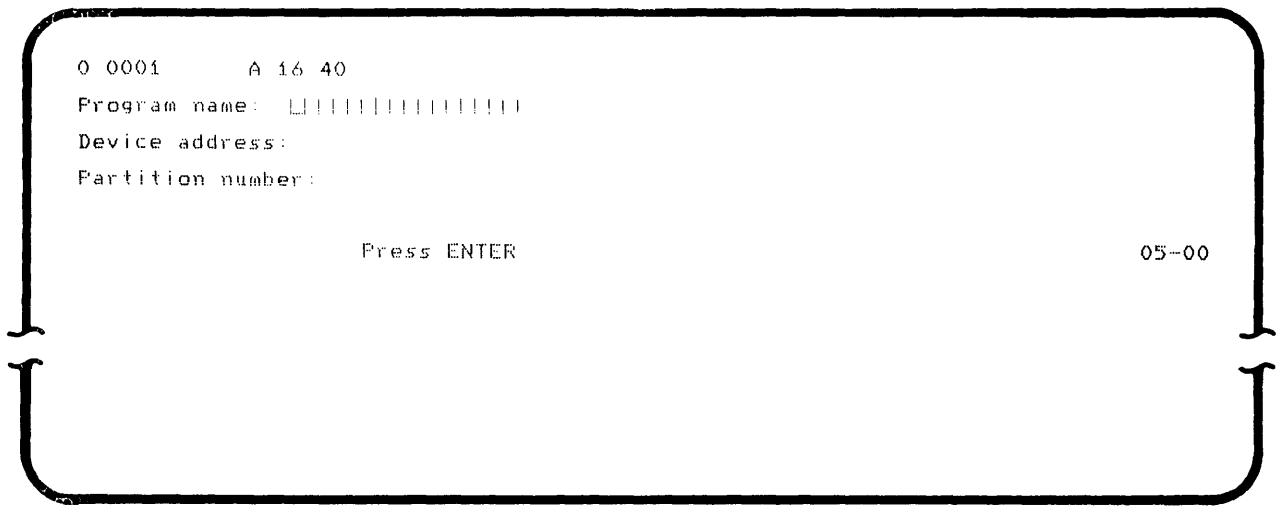
The Device ID and Physical Address Formats

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.

Load the Resource Allocation Utility (05-00)

To load the utility, respond to the following prompt:

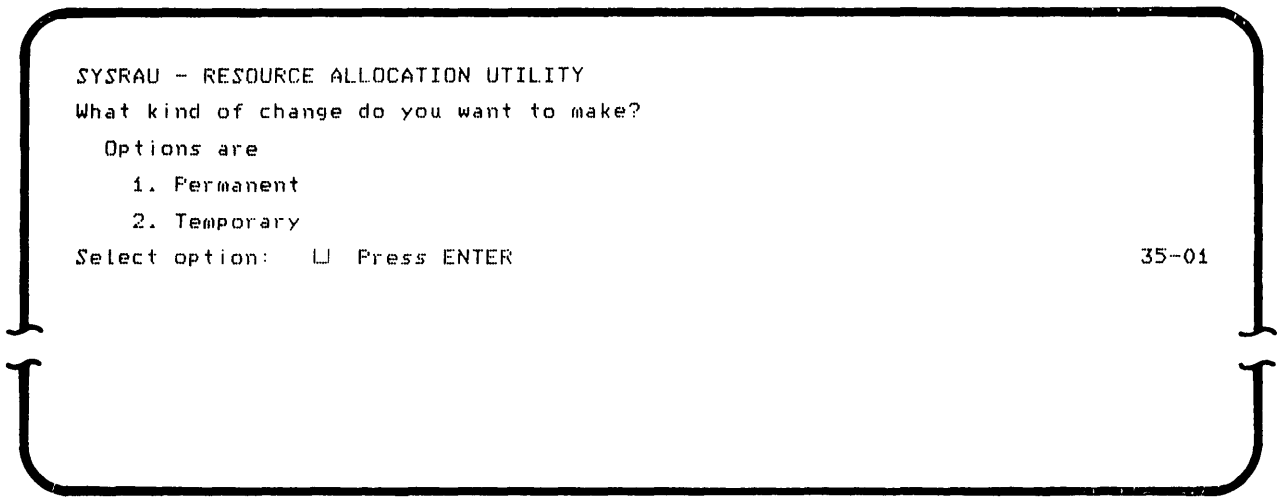


1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYSRAU as the program name.
3. Enter the device address for the diskette drive.
4. Enter the number of the partition where the program will be loaded. (If you do not enter a number, the partition number defaults to the number 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:



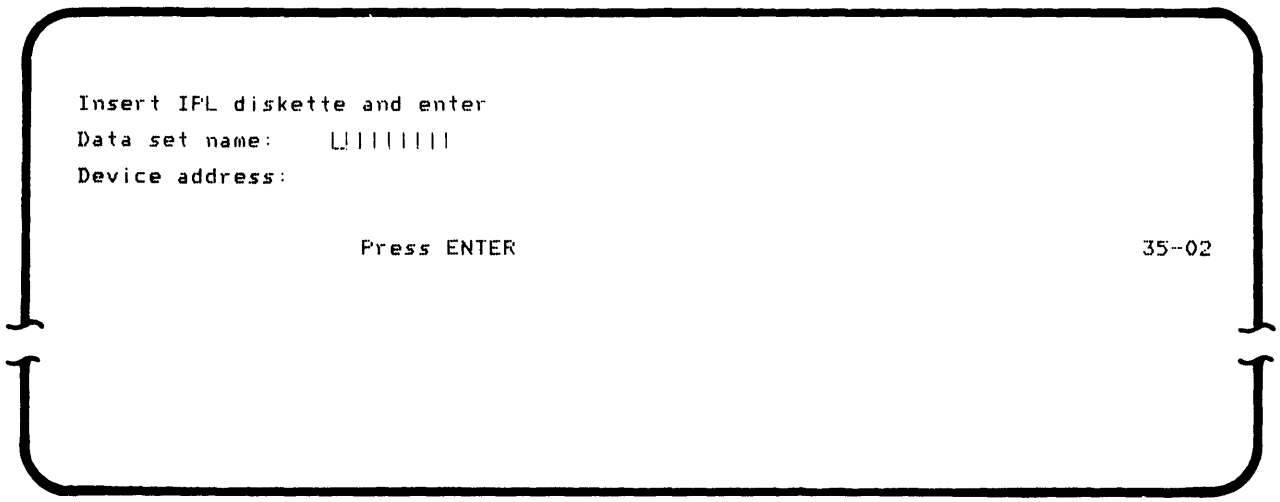
1. Select an option.
2. Press the Enter key.

Permanent changes are made to the diskette 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 the permanent change option (1), the insert IPL diskette prompt (35-02) is displayed. If you select the temporary change option (2), the specify temporary partition entries prompt (35-11) is displayed.

Insert the IPL Diskette for Permanent Changes (35-02)

If you make permanent changes to the resource allocation table, the following prompt is displayed:

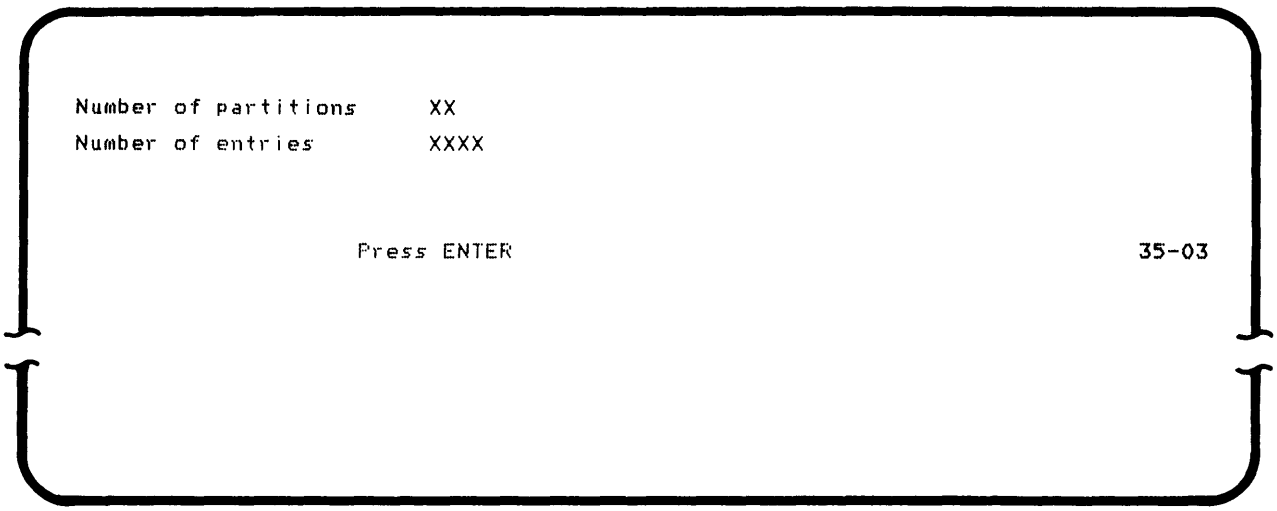


1. Insert the appropriate user-defined IPL diskette.
2. Enter the name of the IPL data set.
3. Enter the device address of the diskette drive where the IPL diskette is inserted.
4. Press the Enter key.

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 diskette, the following prompt is displayed:

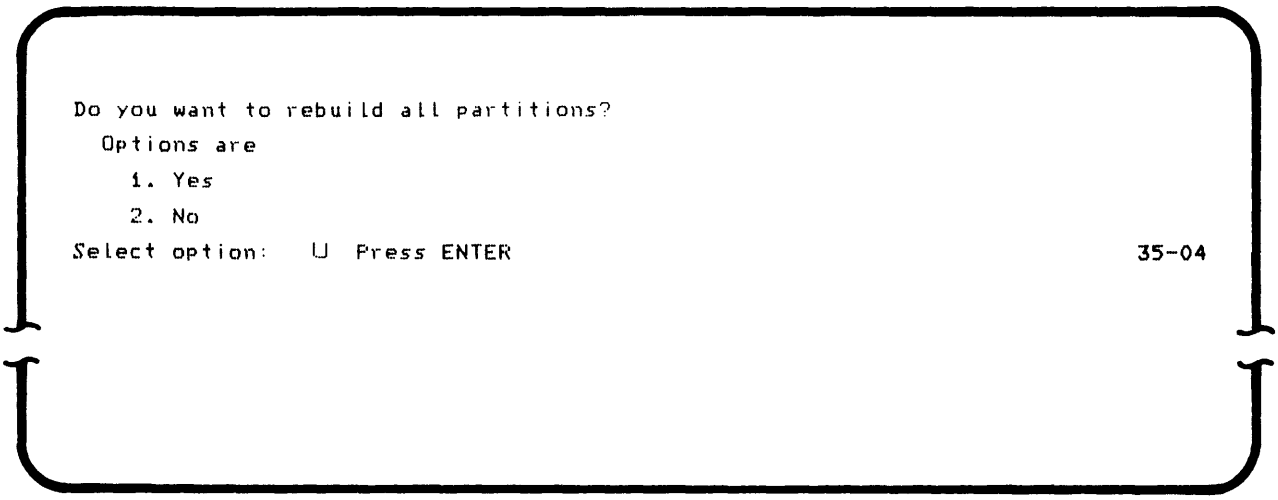


The preceding message displays the total number of partitions in the system and the total number of entries in the resource allocation table.

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 that IPL diskette are lost. The utility program will not allow a partial table rebuild on that IPL diskette. The space set aside for entries is still available for an entire table rebuild.

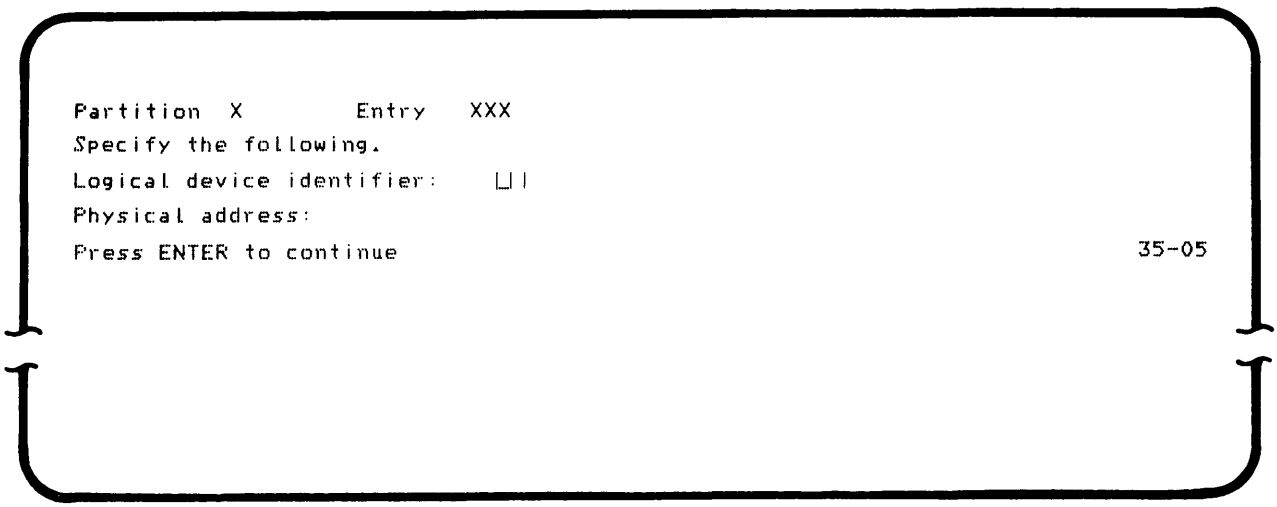


1. Select an option.
2. Press the Enter key.

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:



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 diskette with the entries already made. The partition numbers that were not displayed will have no entries, and 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:   __
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.

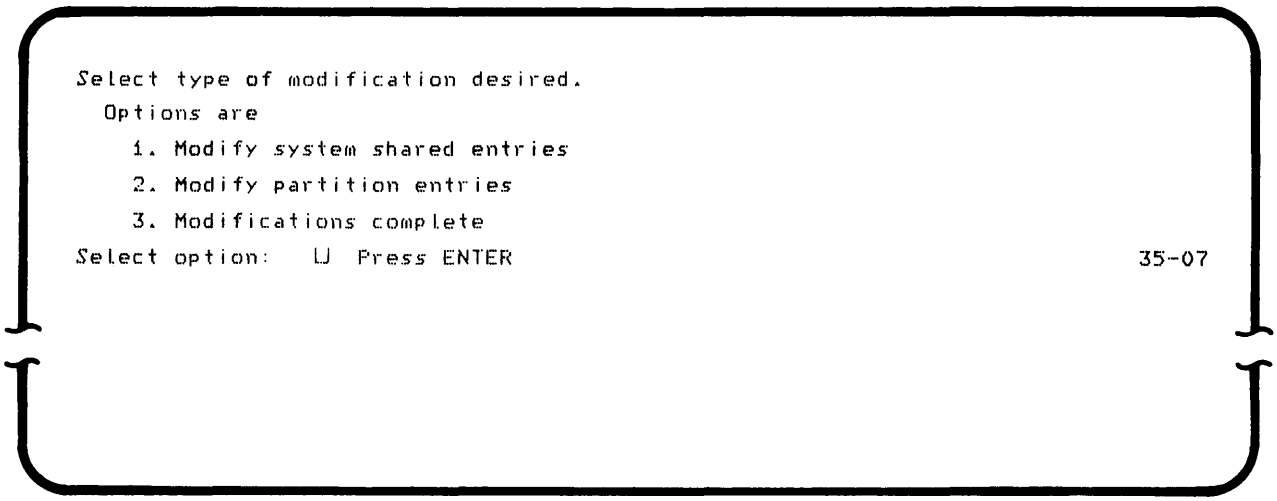
2. Press the Enter key.

The preceding prompt is redisplayed until you have filled the table. If you have made your entries and the table is not full, advance the program to the next prompt by making no entries and pressing the Enter key. The utility-completed prompt (35-78) is then displayed.

If all the space is used before all entries are made, 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:



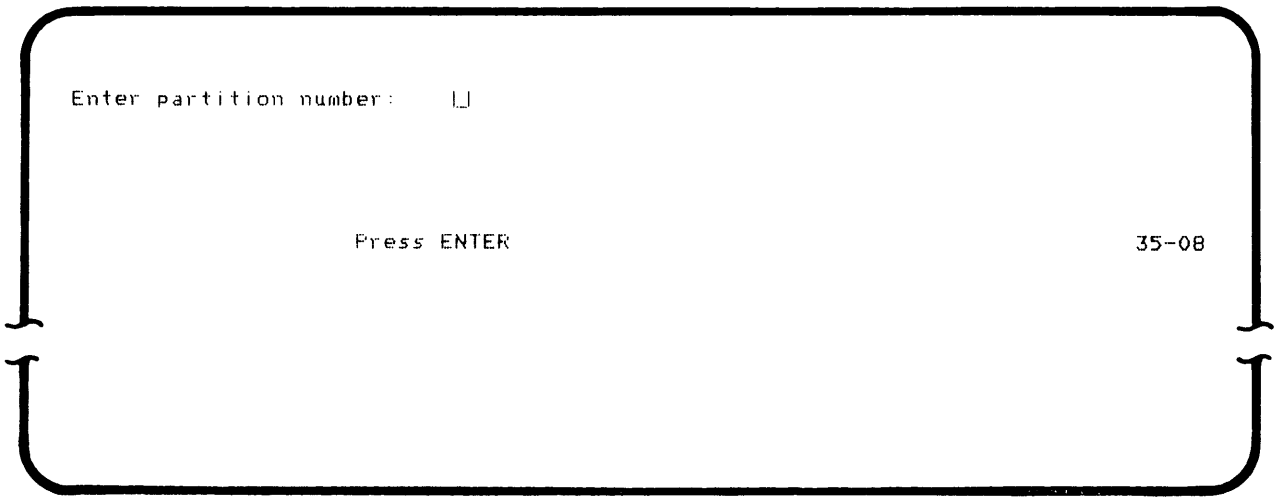
1. Select an option.
2. Press the Enter key.

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 the Partition Number (35-08)

If you want to change only partition entries, the following prompt is displayed:



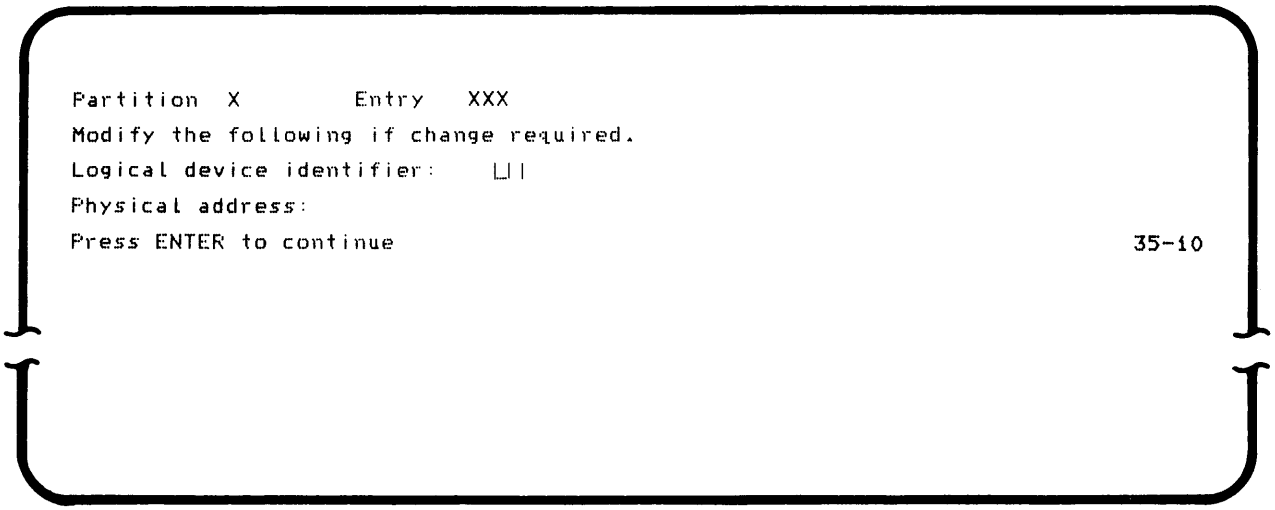
1. Enter the number of the partition that has entries you want to change.

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, prompt 35-10 is displayed:



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.

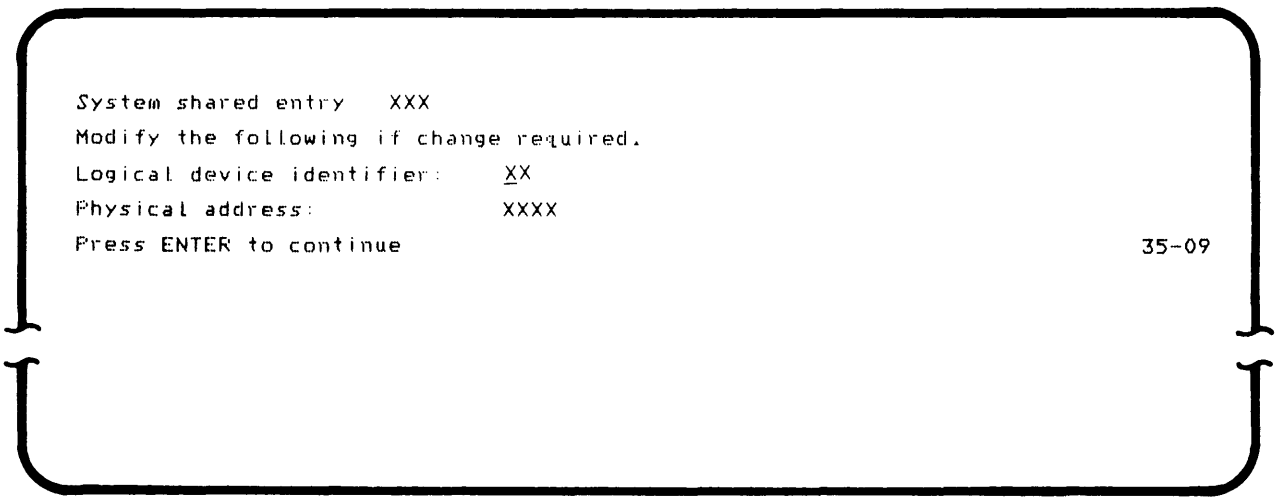
If your system has more than one partition entry, after you view and/or change the first entry and press the Enter key, prompt 35-10 is displayed again. You must view each entry before you advance to the next prompt.

Permanent changes to partition entries become effective only after you perform an IPL with the IPL diskette to which the changes were made.

After you have viewed each existing partition entry, the modification option prompt (35-07) is redisplayed.

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:



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.

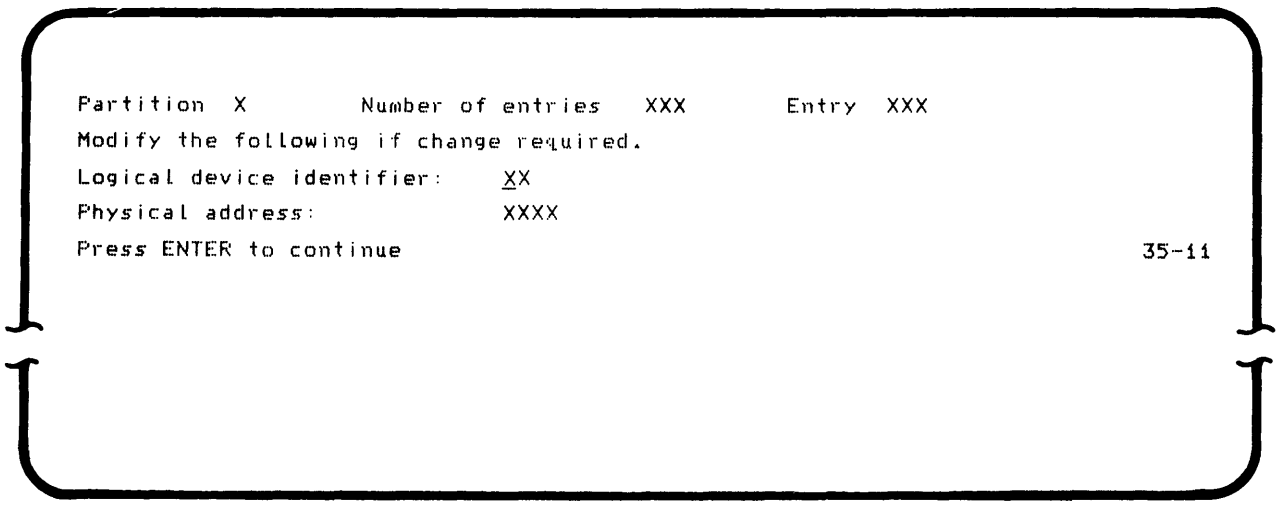
If your system has more than one system shared entry, after you view and/or change the first entry and press the Enter key, prompt 35-09 is displayed again. You must view each entry before you advance to the next prompt.

After you have viewed all existing system-shared entries, the modification option 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:



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 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 5280 system and print or display the status of a user-defined IPL diskette. 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 diskette.

Status Displayed for the System

- The types of partitions on the system, indicated by F for foreground and B for background
- The name of the job loaded into each partition
- The size of each partition, in multiples of 1024 characters

The partitions are numbered 0 through 7.

Status Displayed for a User-Defined IPL Diskette

- The IPL data set name, SYSIPLxx, where xx is user-defined during system configuration
- System size of the 5280 system for which the configuration was designed
- Common functions size
- Common functions data set name
- 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 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 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 forground 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, and SYSHELP with approximate sizes of 6, 15, and 16 K respectively. SYSCFA and SYSHELP must be used with the key entry utility or DE/RPG.

The printer information consists of the number of printers attached to the system, the model 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 *Language/Keyboard Chart* in the appendix.

You can update the current status information by pressing the Enter key.

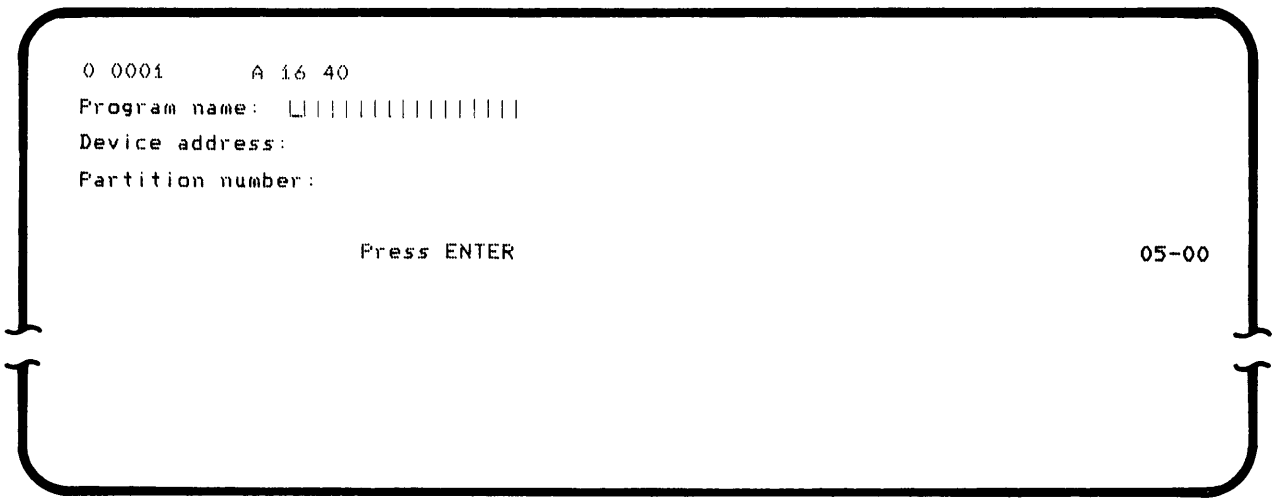
Note: The status of the starter system (SYSIPL on the SCP diskette) cannot be displayed or printed with this utility.

(See the *System Control Programming Reference/Operation Manual* for more information about the user-defined IPL diskette.)

Operation of the System Status Utility

Load the SYSSTAT Utility (05-00)

To load the utility, respond to the following prompt:

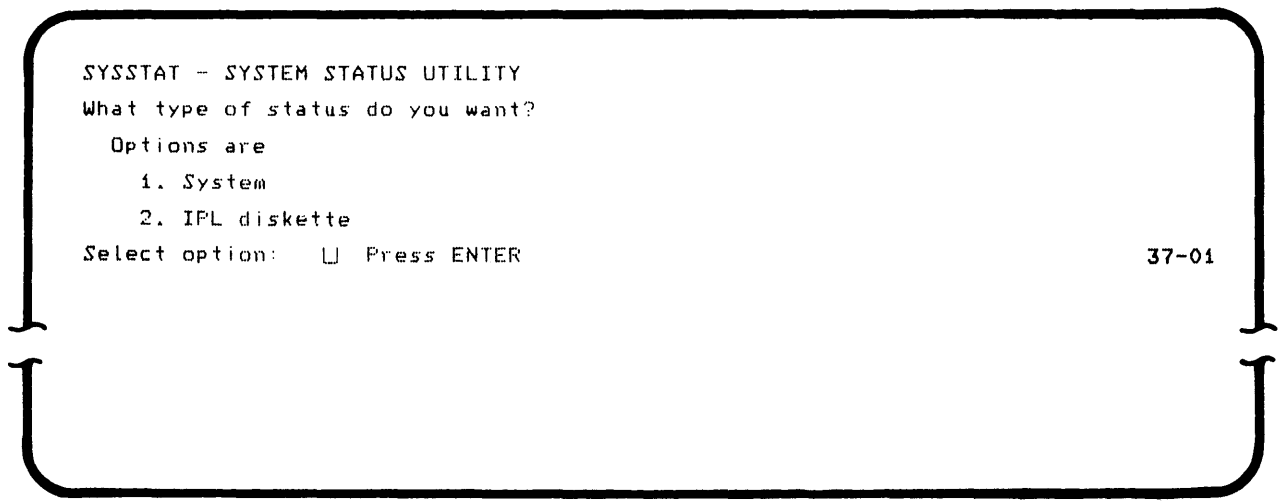


1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYSSTAT as the name of the program to be executed.
3. Enter the device address of the diskette drive.
4. Enter the number of the partition where the utility will be loaded. (If the number of the partition is not entered, the 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 status option prompt (37-01).

Select Status Option (37-01)

After the utility program is loaded, the next prompt is displayed:



1. Enter the option to be used.

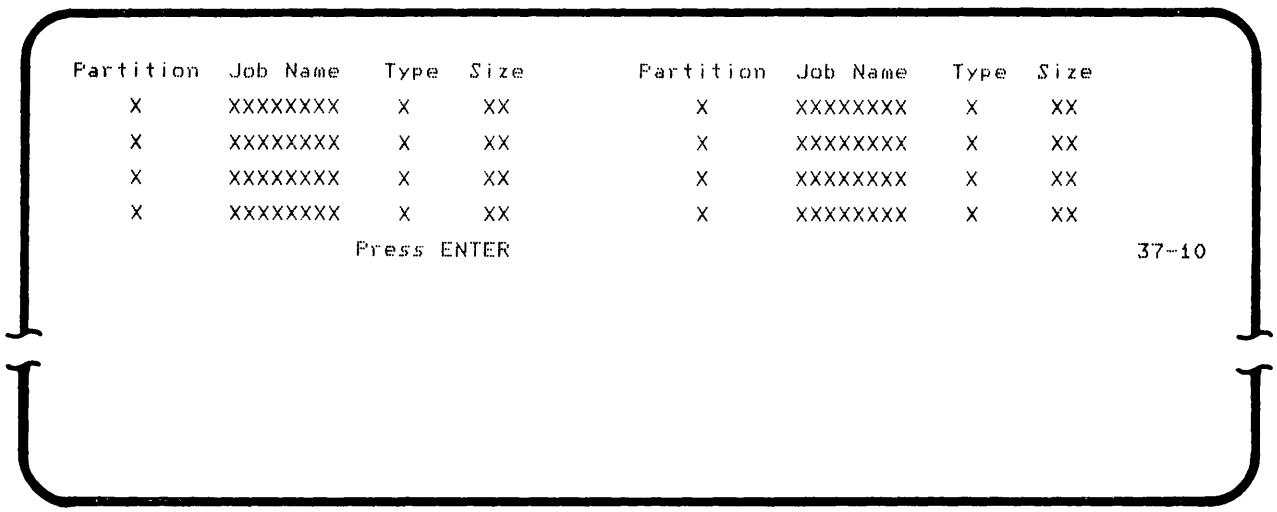
2. Press the Enter key.

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 in prompt 37-01, the following information is displayed.



```
Partition  Job Name   Type  Size      Partition  Job Name   Type  Size
    X      XXXXXXXX    X    XX           X       XXXXXXXX    X    XX
    X      XXXXXXXX    X    XX           X       XXXXXXXX    X    XX
    X      XXXXXXXX    X    XX           X       XXXXXXXX    X    XX
    X      XXXXXXXX    X    XX           X       XXXXXXXX    X    XX
                    Press ENTER                                    37-10
```

The partition numbers (0 through 7), the job name, the partition types (foreground or background), and the partition sizes (minimum of 6 K and maximum of 64 K) are displayed.

Asterisks appear in the job name field only for a background 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.

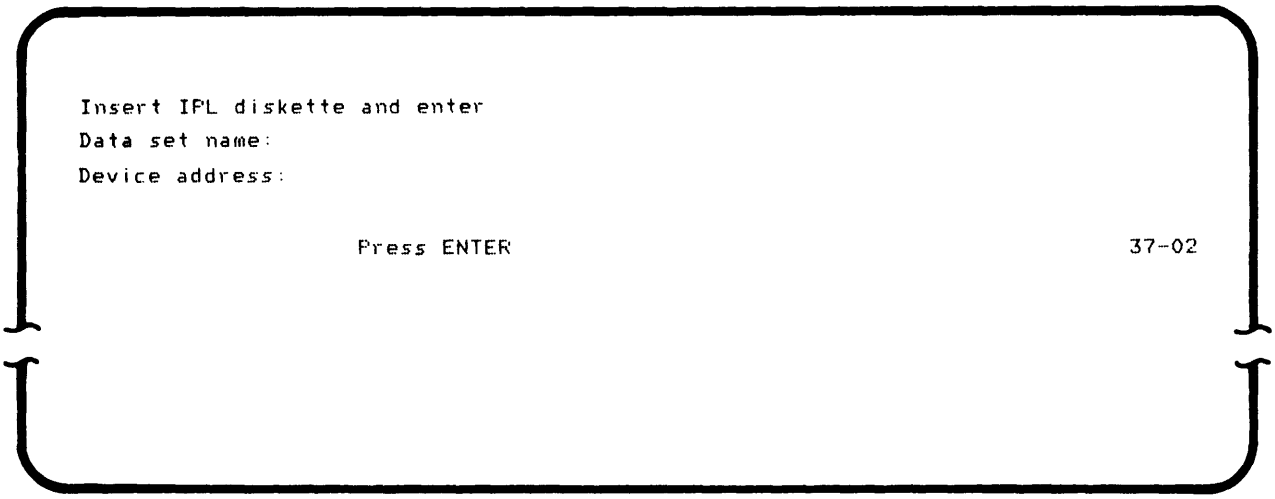
The job name displayed for a foreground partition is the name of the last job loaded into that partition (even if the partition is available to be loaded).

Press the Enter key 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.

Insert the IPL Diskette (37-02)

If you select the IPL diskette option in prompt 37-01, the following prompt is displayed:



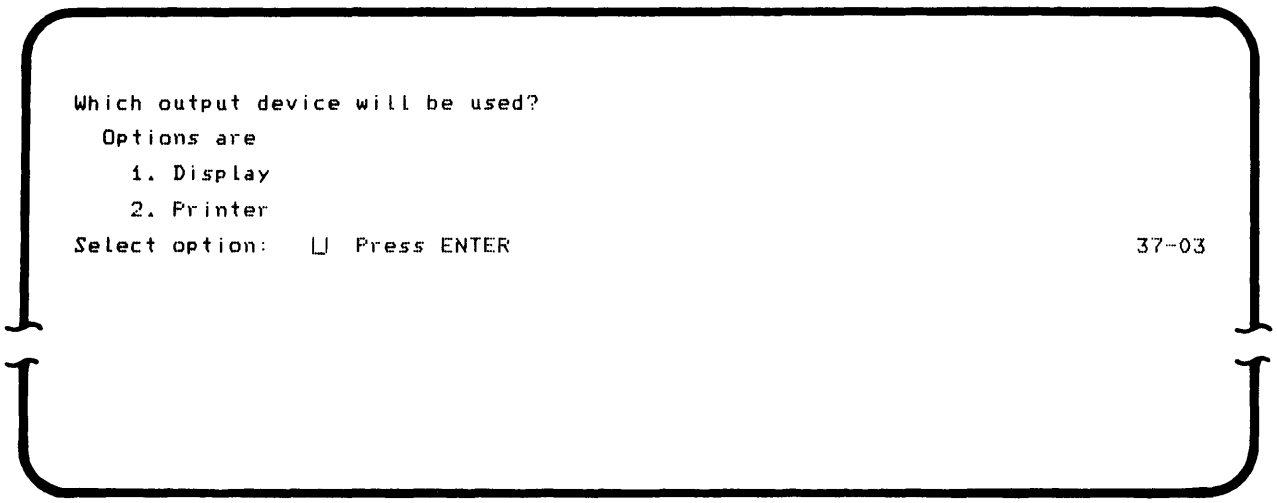
1. Insert the IPL diskette into a diskette drive.
2. Enter the IPL data set name specified during system configuration.
3. Enter the diskette drive device address.
4. Press the Enter key.

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 of the 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:



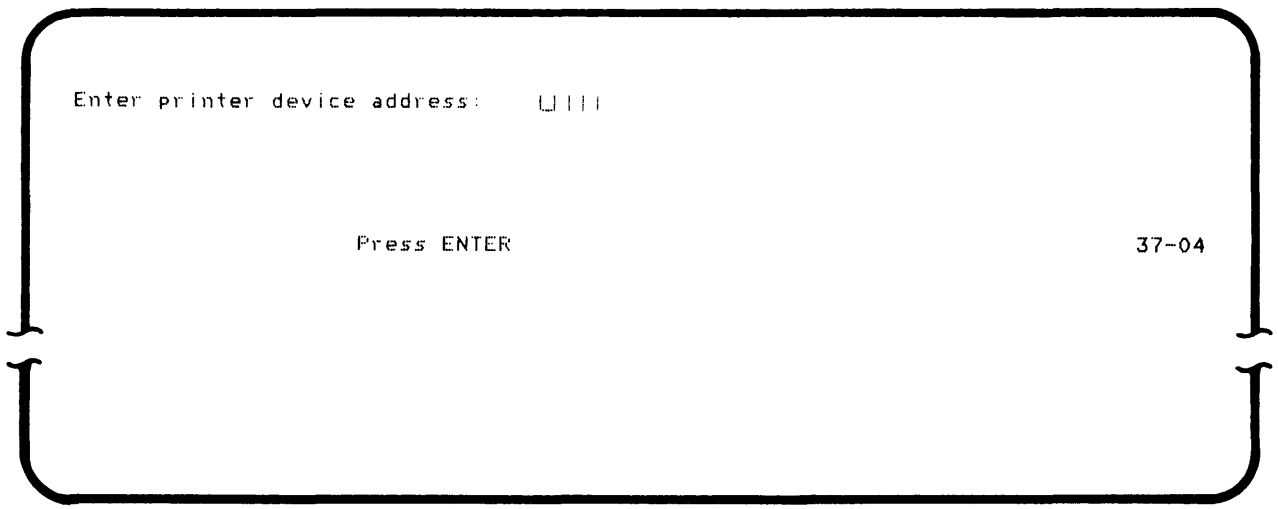
1. Enter a 1 to display the IPL diskette status information, or enter a 2 to print the information.

2. Press the Enter key.

If you select option 1, the first of the display IPL diskette status prompts (37-06) is displayed. If you select option 2, the printer address prompt (37-04) is displayed.

Print the IPL Diskette Information (37-04)

If you select the print option the following prompt is displayed:



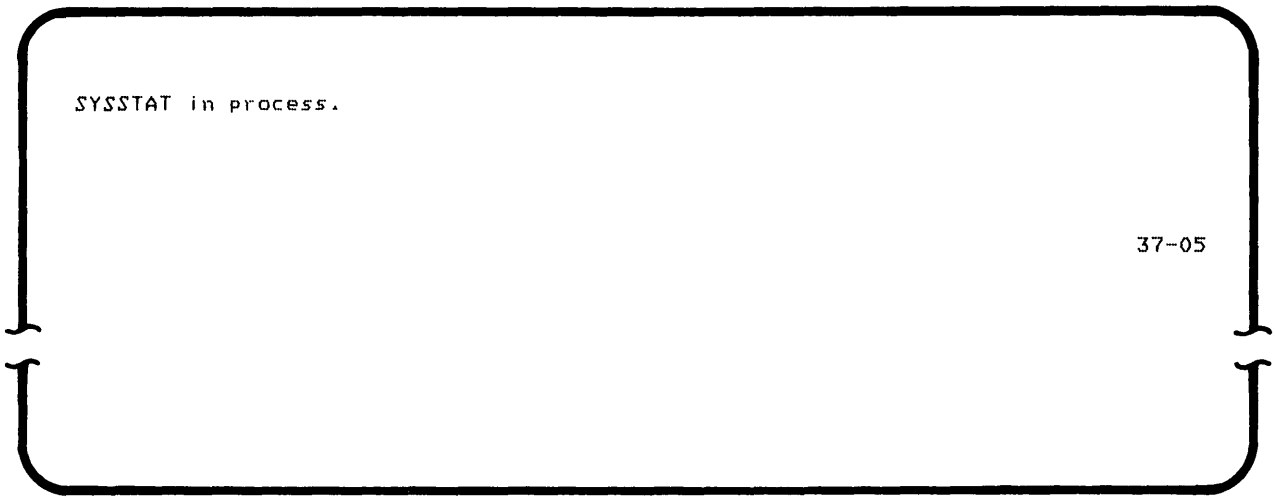
1. Enter the device address of the printer that will print the IPL diskette status information.

2. 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:



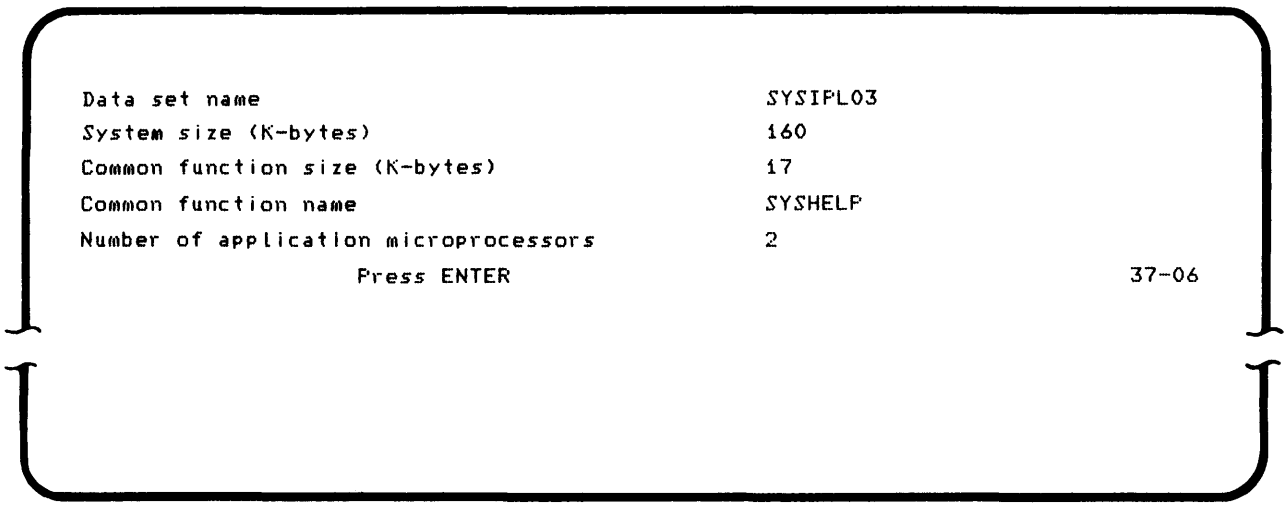
The message remains displayed until the printing is completed. Then the utility-completed prompt (37-78) is displayed.

A typical printout of an IPL diskette's status looks like the sample below.

```
Data set name                                          SYSIPL03
System size (K-bytes)                                  160
Common function size (K-bytes)                         17
Common function name                                   SYSHELP
Number of application microprocessors                  2
ASCII                                                  YES
Date prompt                                            YES
Number of diskette drives                              4
BSC Multipoint Monitor provision                       YES
BSC Multipoint Monitor installed                       NO

Printer  Type   Device address
   1     5256         8000
   2     5225         8008

Partition  Type  Size
    0        F    15
    1        F    31
    2        B    32
    3        B    64

Application microprocessor              1          2
    First partition given service       0          0
    Last partition given service        3          1

Programs to load at system IPL time
    Partition        Program name          Loaded by FG partition
        0              PROGRAM1                      0
        1              PROGRAM2                      1

Default device addresses for loading partitions
    Partition        Device address
        0                4000
        1                4400

Keyboard   Display type    Language/Keyboard
    0            5               002
    1            5               002


Partition   0 entries
D1/4000 D2/4800


Partition   1 entries
D1/4400 D2/4C00


Partition   2 entries
D1/4000 D2/4800


Partition   3 entries
D1/4400 D2/4C00


System shared entries
F1/8000 F2/8008
```

Display the IPL Diskette Status Information (37-06 through 37-20)

If you display the IPL diskette status information, the following information is displayed:



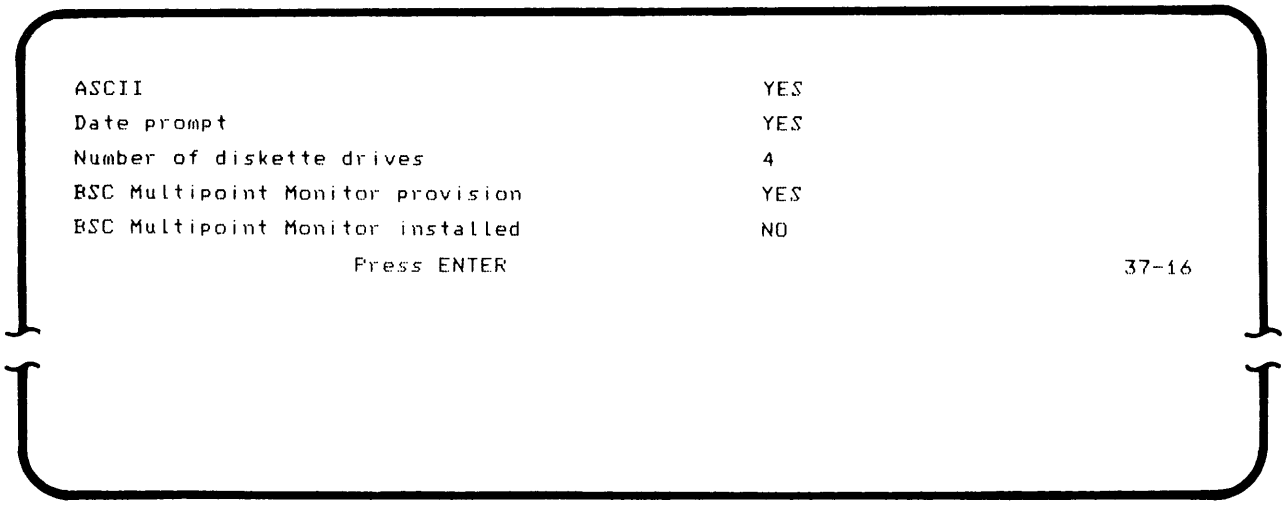
The data set name is the user-defined name for the IPL data set.

The system size is a number from 32 K to 288 K of storage bytes.

The common function size is approximately 6 K for SYSDPRT2, common function option one; approximately 15 K for SYSCFA, common function option two; and approximately 16 K for SYSHELP, common function option three.

The common function name is the name of the common function data set: SYSDPRT2, SYSCFA, or SYSHELP.

Press the Enter key to continue. The next IPL diskette status information prompt (37-16) is displayed.



YES or NO is displayed in the ASCII field to denote whether or not the system can use ASCII diskettes.

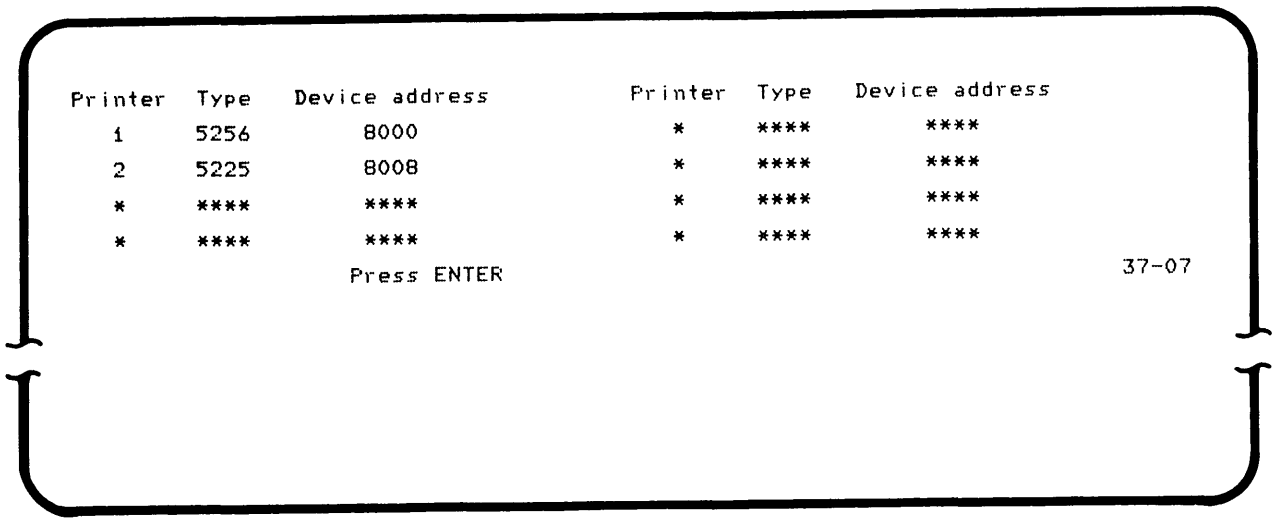
The date prompt field shows YES or NO to indicate whether or not the date prompt is displayed following an IPL.

The number of diskette drives shows the number of diskette 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 a BSC multipoint monitor.

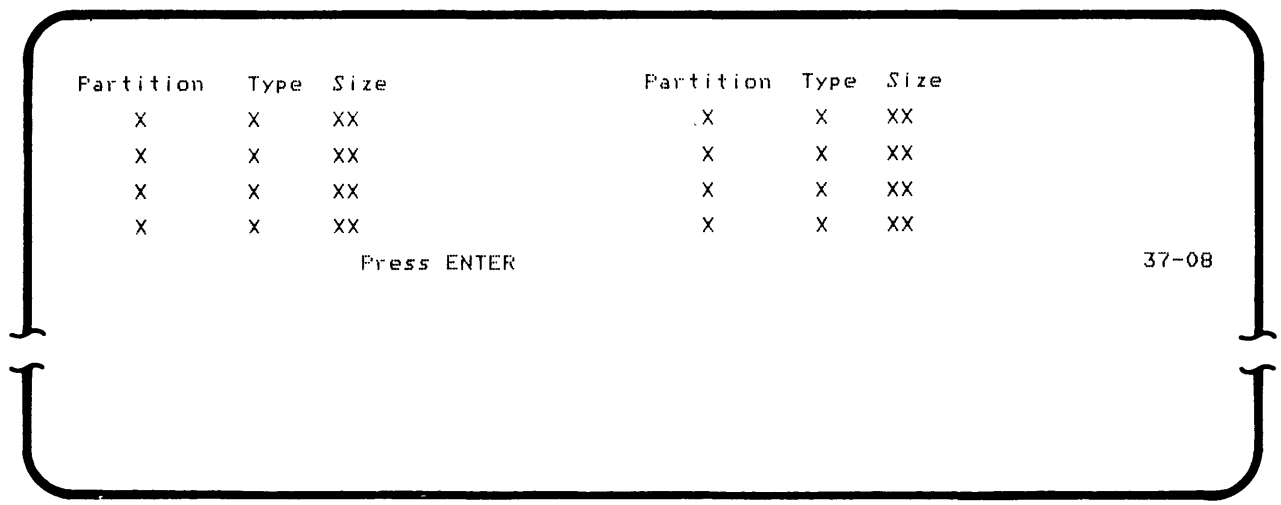
YES or NO in the BSC multipoint monitor installed field indicates whether or not the BSC multipoint monitor program has been installed.

Press the Enter key to continue. The printer information prompt (37-07) is displayed.



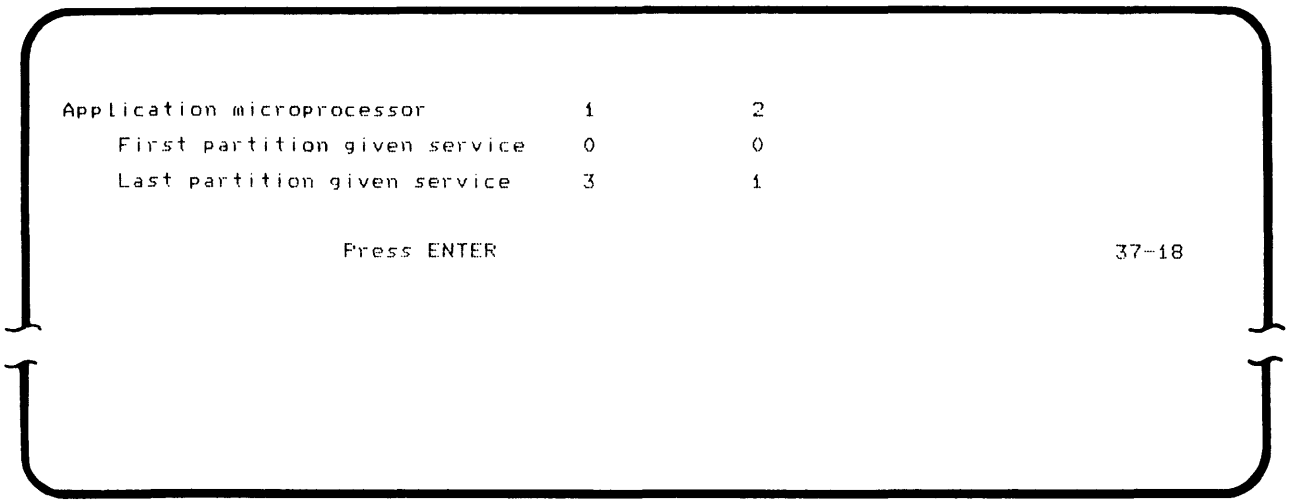
The printer numbers (1 through 8), machine number, and device addresses are displayed. Asterisks appear in the fields if a printer is not configured. To advance to the next display, press the Enter key.

The partition information is displayed as follows:



The type, size, and number of each configured partition are displayed. Partition type is either F or B for foreground or background, and the partition sizes (6-64) are listed in K bytes (K = 1024). Asterisks are displayed in the fields if a partition is not configured. Press the Enter key to display the next prompt.

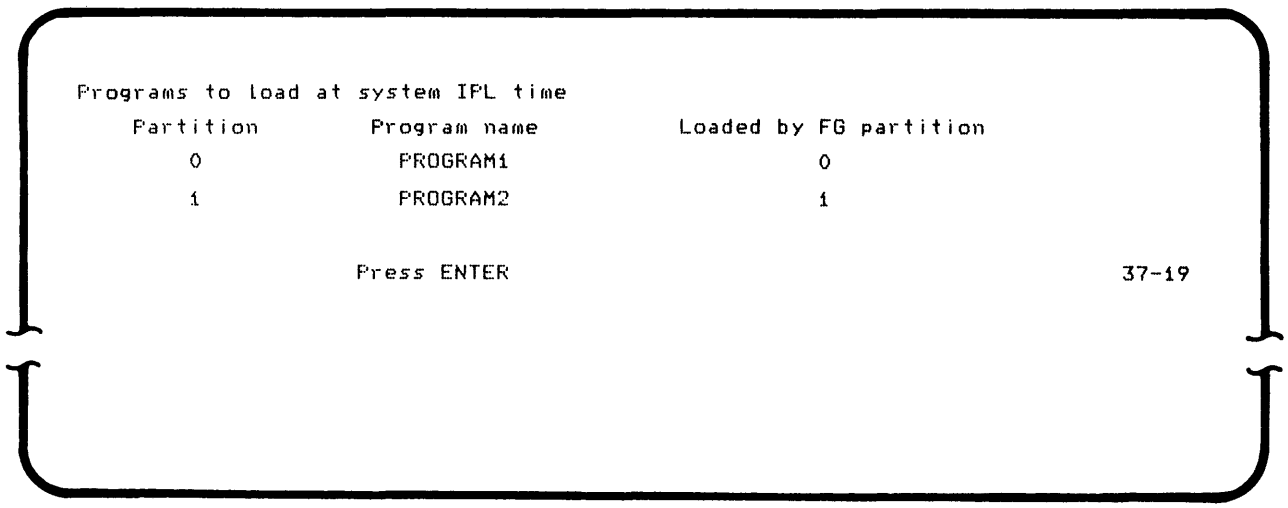
If two application microprocessors are specified in the configuration, the following information is displayed:



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.

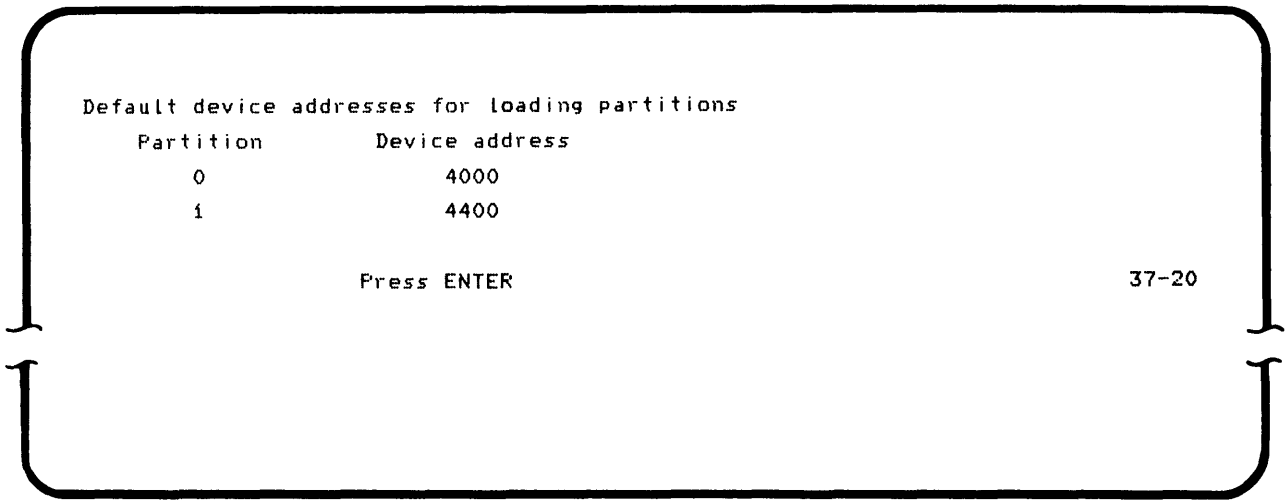
If any programs are to be loaded automatically following IPL, the following prompt is displayed.



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 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.

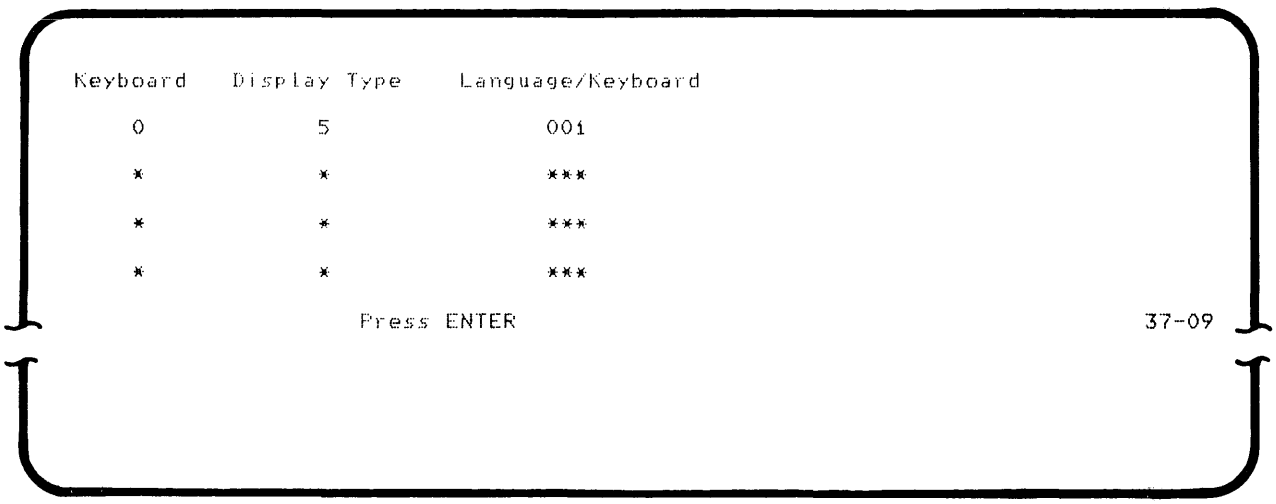
If default device addresses for the load prompts have been specified in the configuration, the following prompt is displayed:



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:



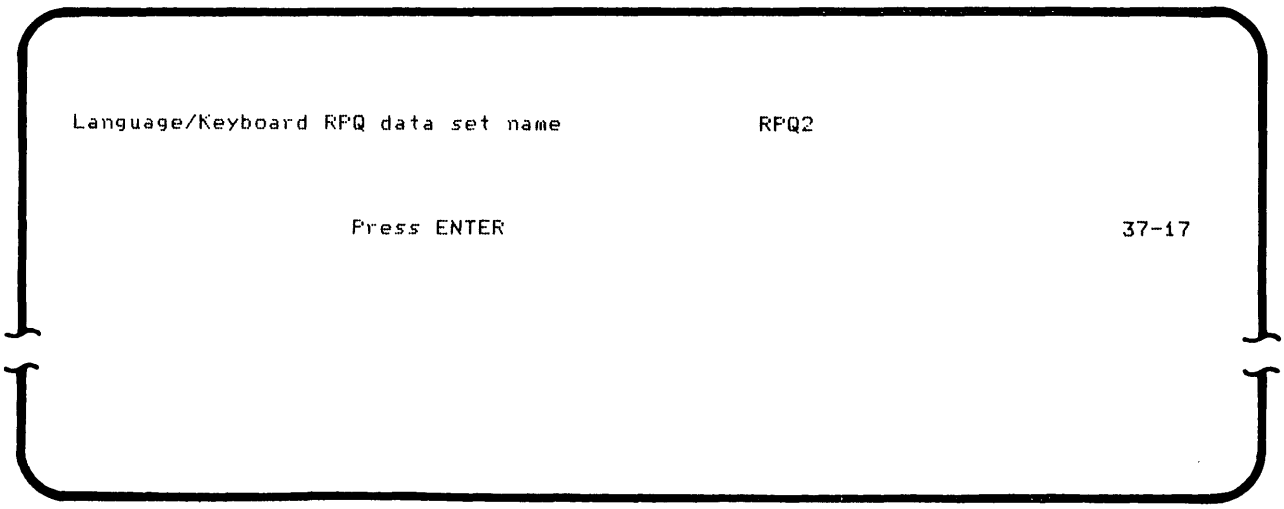
The keyboards are numbered from 0 to 3. The display type is listed as a one-digit number from 1 through 5, and depends on the number of characters that can be displayed on the screen and the screen type, as follows:

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 the *Language/Keyboard Chart* in the appendix for an explanation of these numbers.

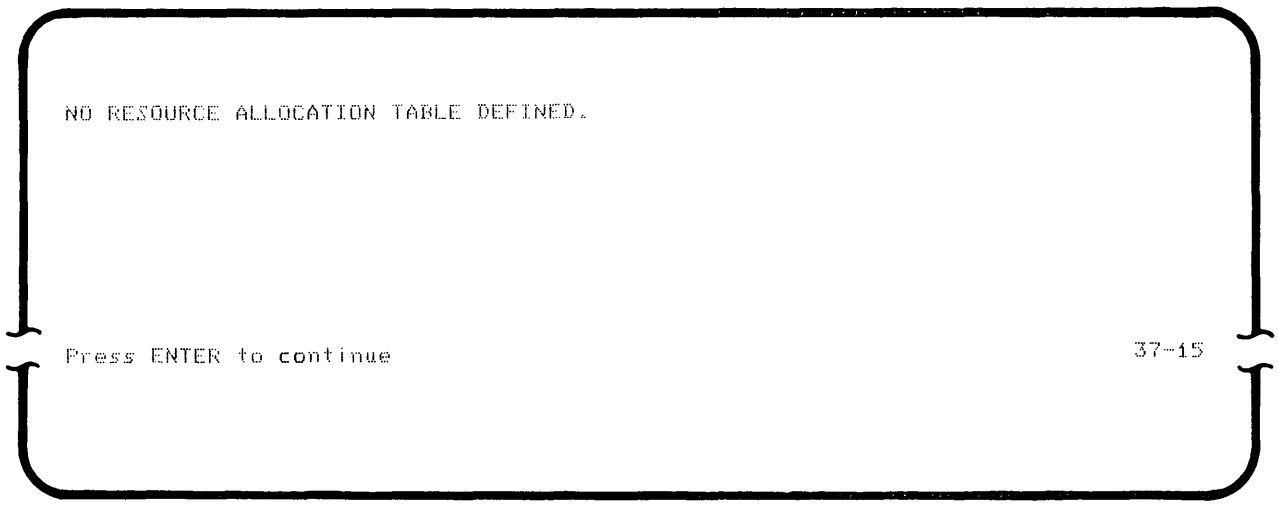
Press the Enter key to display the next prompt.

If an RPQ language has been specified, its data set name is displayed in the following prompt:



Press Enter to display the next prompt.

If a resource allocation table has not been defined for the system, the following prompt (37-15) is displayed:



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 *The Resource Allocation Utility* in Chapter 9.

```
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.

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Chapter 11. The Diskette Compress Utility (SYSCOMP)

The diskette compress utility places all unused sectors that exist between data sets into one contiguous area on a diskette. To do this, the utility rewrites all the undeleted data sets as close to cylinder 0 (the beginning of the diskette) 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 on the diskette are moved as close as possible to the beginning of the diskette. The unused space that previously existed *between* data sets now exists 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.

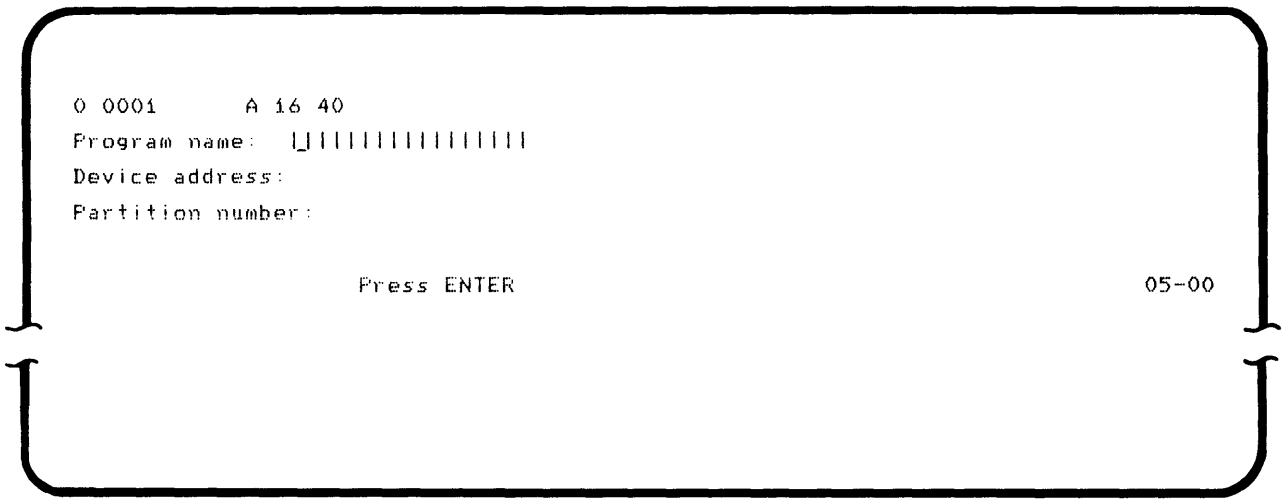
If an I/O error occurs while the diskette compress utility is moving labels or data, the utility attempts to restore the diskette to a usable state before displaying the utility terminated prompt (23-79). If the attempt to restore the diskette fails, an informational message is displayed to let you know that the diskette might be unusable.

Operation Of The Diskette Compress Utility

Before using the compress utility to compress data on a diskette, you might want to copy the data on the diskette to a backup diskette.

Loading the Diskette Compress Utility (05-00)

To load the diskette compress utility, respond to the following prompt:

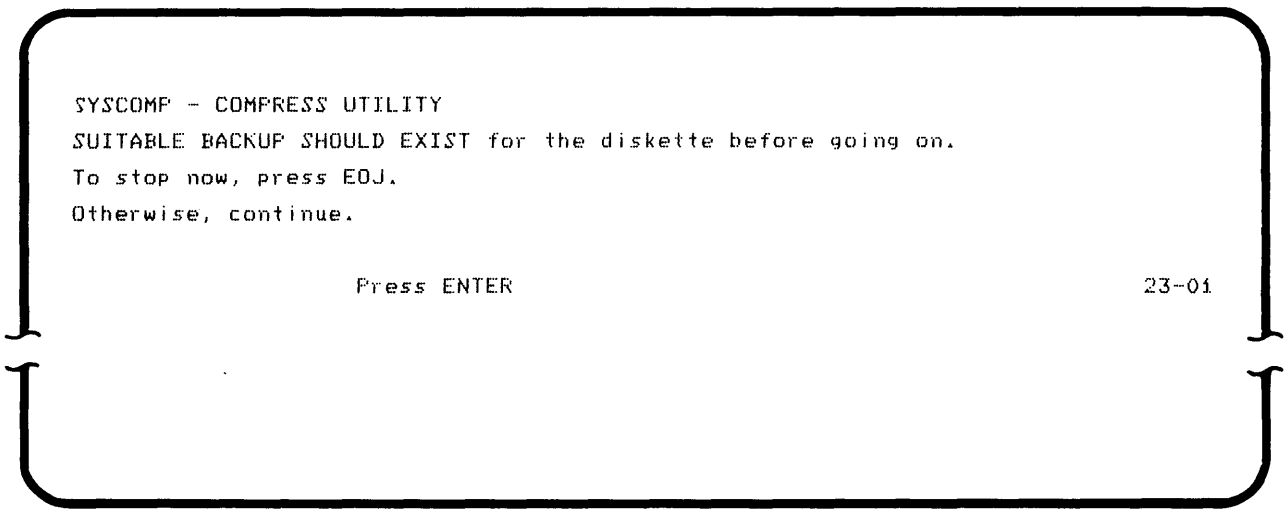


1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYSCOMP as the program name.
3. Enter the device address of the diskette drive where the diskette is located.
4. If the utility is to run in a background partition, enter the partition number of the background partition.
5. Press the Enter key.

The utility is loaded, and the backup copy prompt (23-01) is displayed.

Suitable Backup Should Exist Before Compressing (23-01)

After the 5280 system loads the utility into the storage area, the following prompt is displayed:



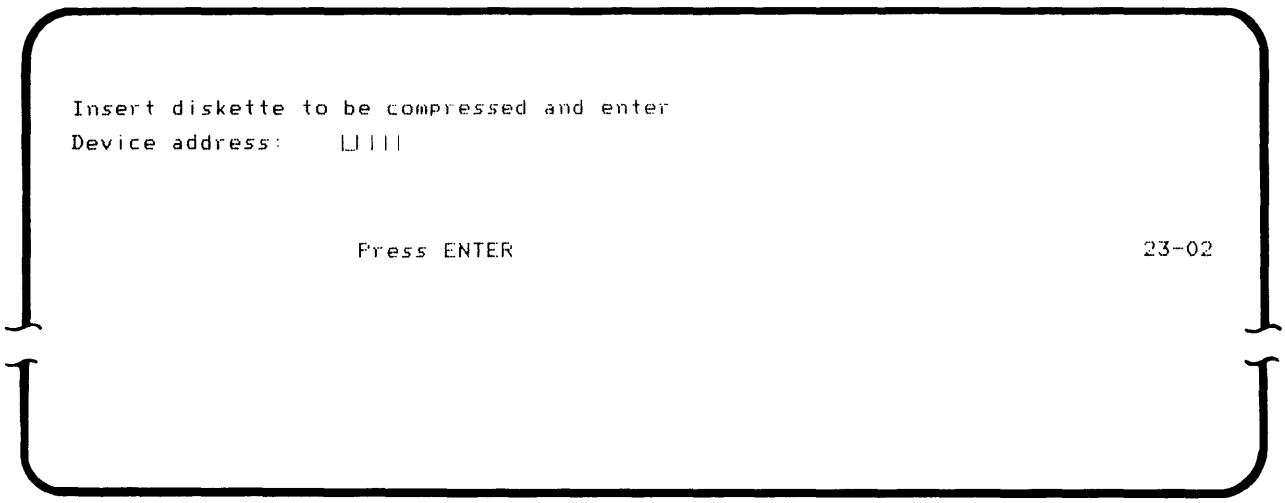
If you do not have a backup copy for the data to be compressed, you can terminate the utility and make the backup copy before proceeding. Or you can load the copy utility into another partition and make the copy. An image copy of the diskette is usually the fastest way to create a backup copy.

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 diskette 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)



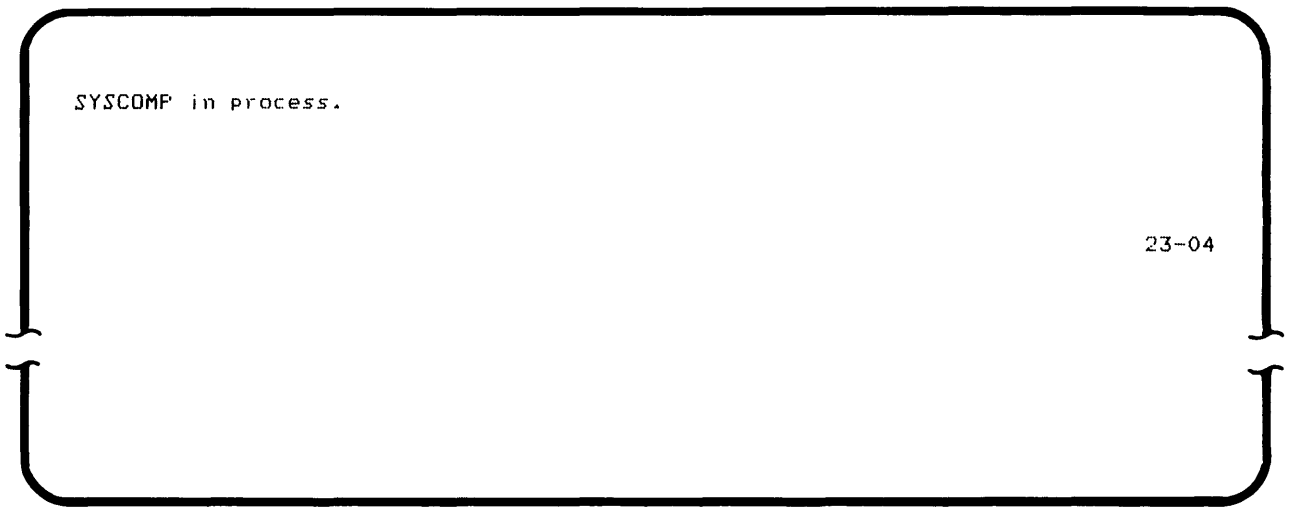
1. Insert the diskette to be compressed.
2. Enter the device address.
3. Press the Enter key.

If the diskette is volume-protected, the volume-protect 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, the following message is displayed:



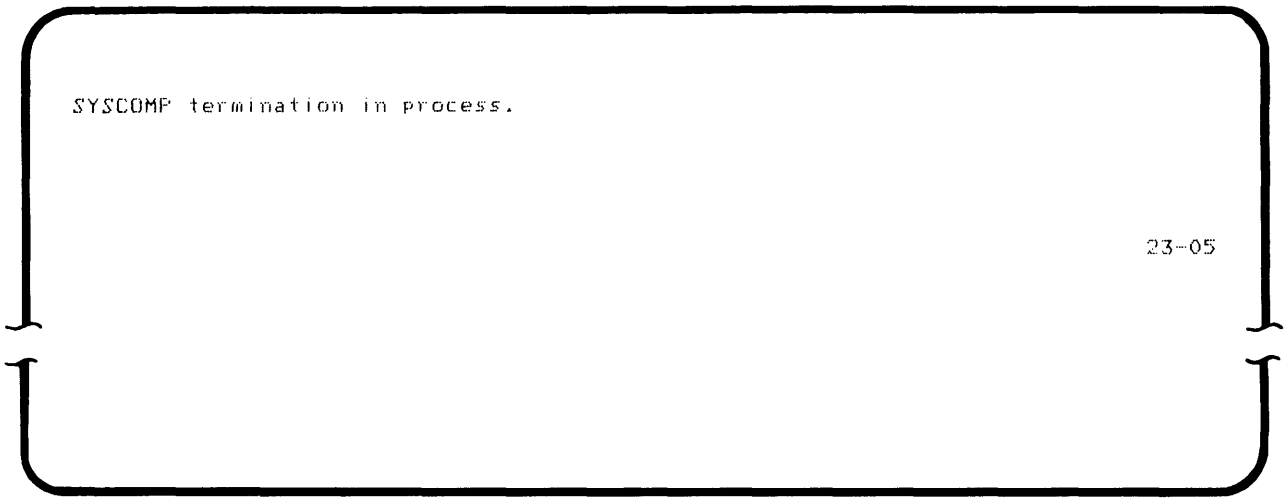
The data set labels are sorted into the same order as the data sets on the diskette and are rewritten starting at the beginning of the diskette label area. Then the utility moves each data set to its new location on the diskette. As each data set is moved, the utility modifies its label to reflect the new location.

Note: The diskette locking door should *not* be opened while the compress utility is running.

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:

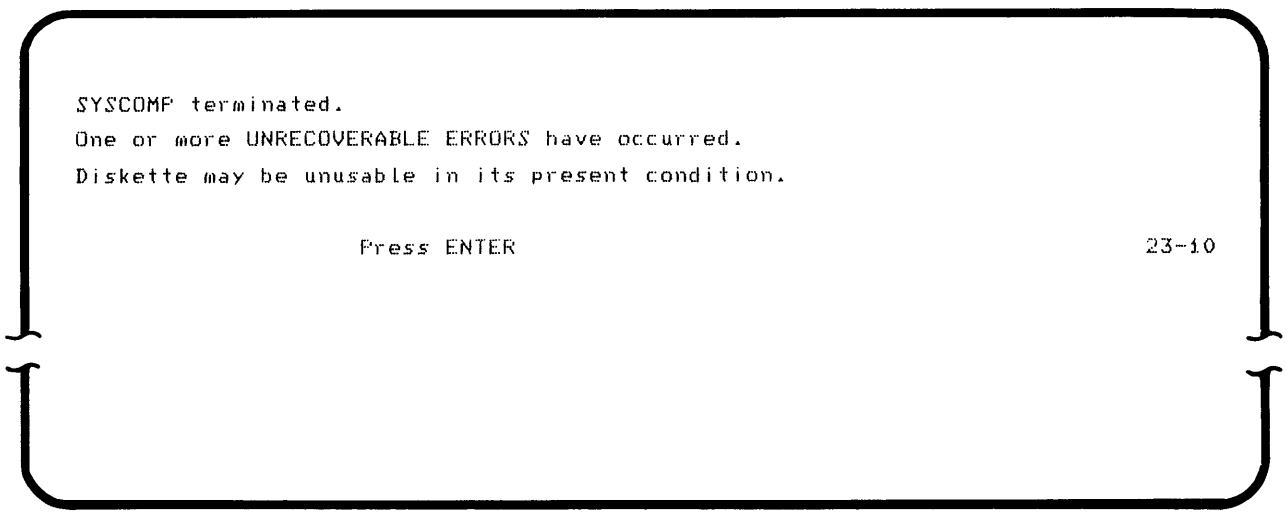


Note: The above prompt might be displayed very briefly and not be seen before the utility terminated prompt (23-79) is displayed. In other cases it might remain displayed for a considerable length of time while the utility continues to a point in the compress process where it can terminate without a 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 diskette 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:



If this message is displayed, the error that caused the program to terminate has also affected the data on the diskette. One or more data set header labels may have been lost due to an unrecoverable error, or a data set has been partially overlaid during the compression process. The diskette label list and diskette 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, the backup copy prompt (23-01) is redisplayed.

Hints

- Since the diskette compress utility operates upon the input diskette, read or write errors or other interruptions of the compress process can result in an unusable diskette. You should always have some form of backup for the diskette 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 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 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 might be unusable.

Restrictions

- Because the diskette compress utility rearranges header labels, it is not advisable to use this utility to compress diskettes for which the ordering or position of the header labels in the label area is critical. IPL diskettes that are created using the system configuration program are an example of this and *should not be compressed* using this utility.

- Diskettes 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. This utility loads them from the diskette 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 input and output diskettes according to the partition size being used.

Partition Size	Max. Sector Size of Input Diskette	Max. Sector Size of Output Diskette
9 K	512[1] or 256[2]	256
10 K	1024[1] or 512[2]	512
11 K	1024	1024

[1]If sector size divided by record length has a remainder of 0.
[2]If sector size divided by record length has a non-zero remainder.

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: 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
```

```
0 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  I F1        1E                           3
            Z  3 F3        1E                           8
            Z  8 F8        1E                           1
            Z  A FA         E
```

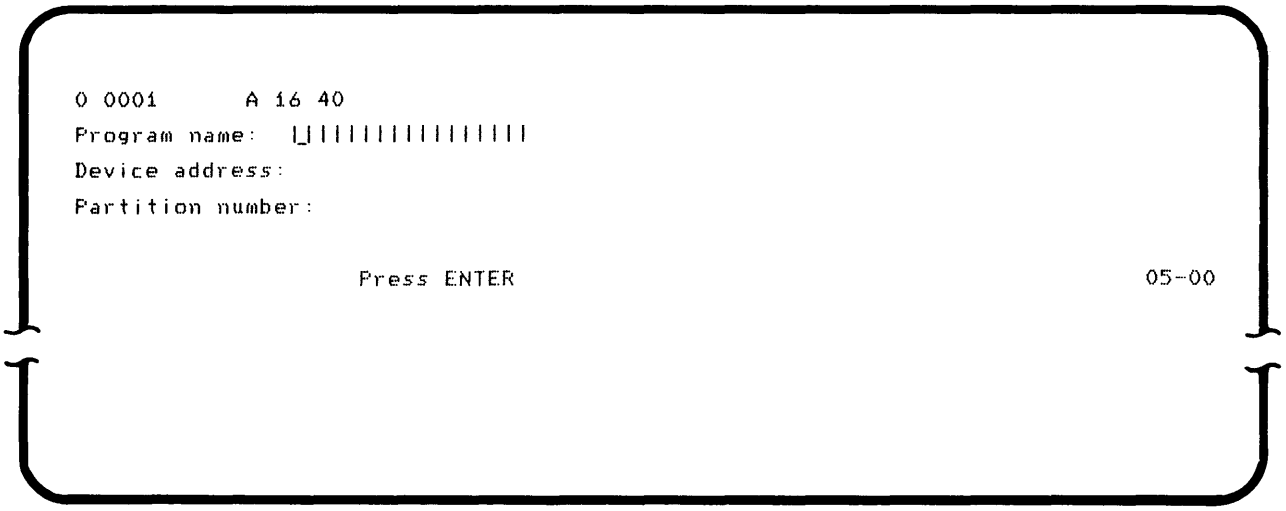
A Specifications

```
Column:      6          17  19        30    35  38       45
             A          F   TRANSJOB  128                DEVICE(DISK D1)
             A          F   CRT       128                DEVICE(CRT) DSPSIZ(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(AAAAAANAAANNAAA)
             A          R   FA                  I
             A                        00005 A            CHECK(RB)
             A                        00006 N            CHECK(BC)
```

OPERATION OF THE FORMAT CONVERSION AID UTILITY

Load the Utility (05-00)

To load the utility, respond to the following prompt:

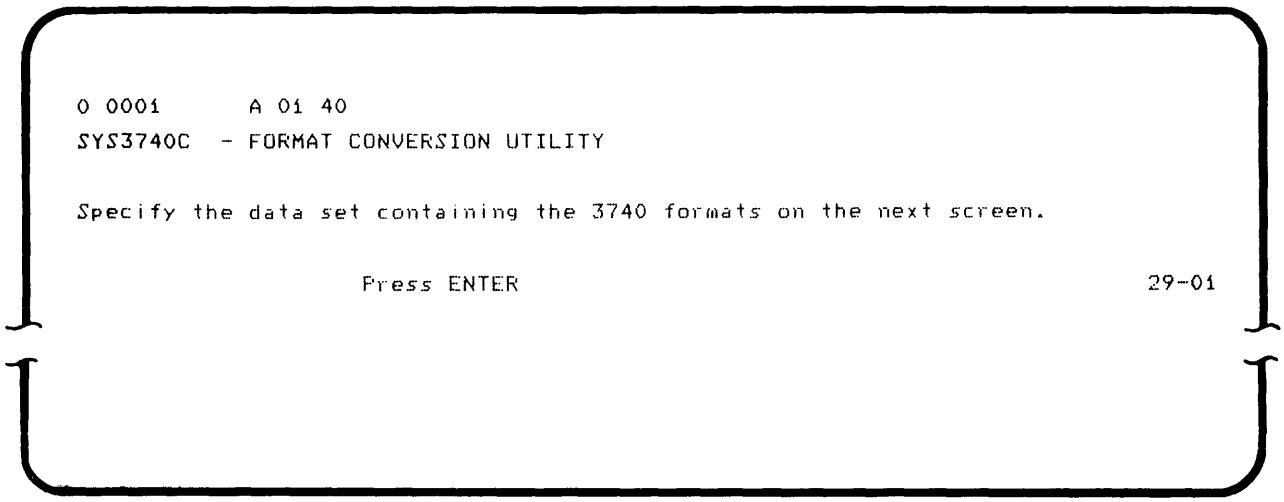


1. Insert the diskette containing the utility into a diskette drive.
2. Enter SYS3740C as the program name.
3. Enter the device address of the diskette drive where the utility diskette is inserted.
4. Enter the number of the partition where the program will execute. (If a partition number is not entered, the number defaults to the number of the partition associated with your keyboard.)
5. Press the Enter key.

The system loads the utility and displays a message (29-01).

Informational Message (29-01)

After the utility is loaded, the following message is displayed:

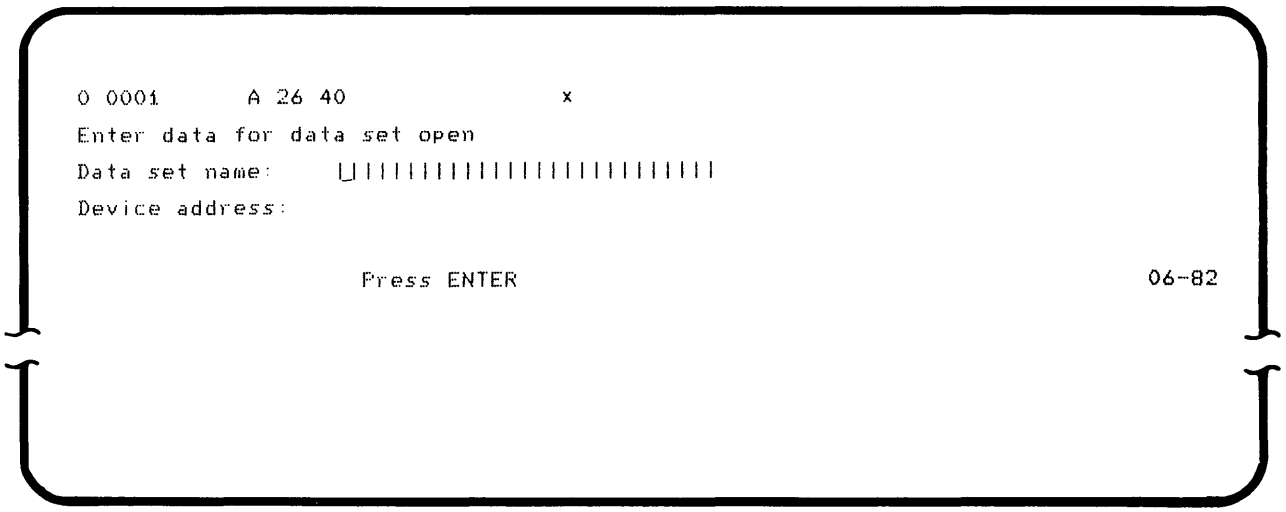


Press the Enter key.

The data set open prompt (06-82) for the data set that contains the formats is displayed.

Open Data Set Containing the Formats (06-82)

After the message, the following prompt is displayed:



1. Insert the diskette that contains the formats to be converted into a diskette drive.

2. Enter the data set name and device address for the data set containing the formats to be converted.

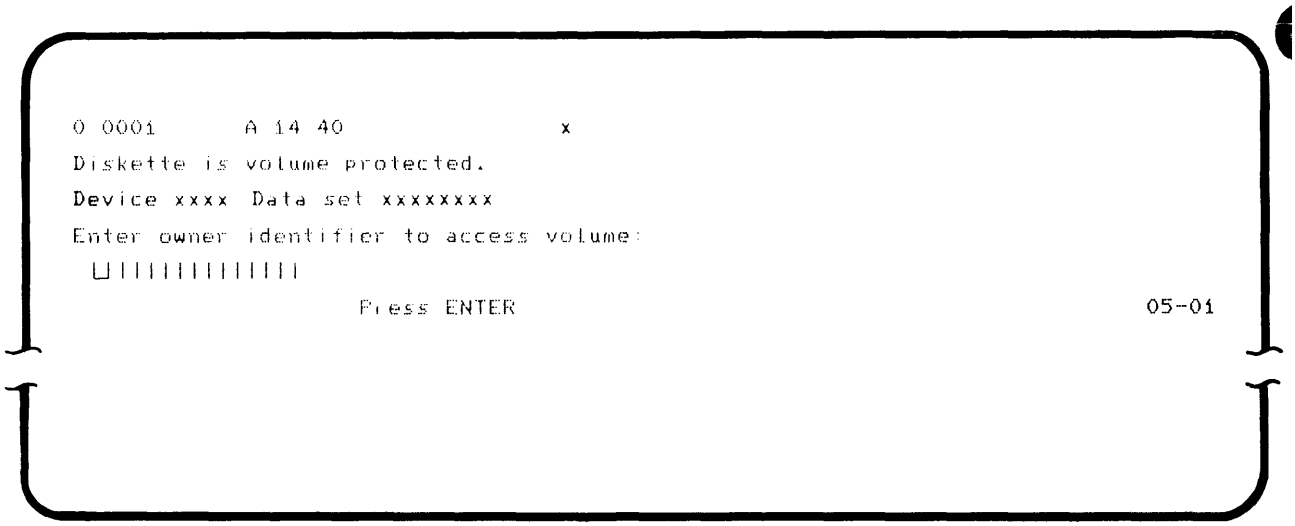
3. Press the Enter key.

The data set is opened unless an error occurs or the diskette is volume-protected.

If an error occurs, see the *Message Manual* for recovery procedures. If the diskette is volume protected, the volume-protected prompt (05-01) is displayed.

If the data set is successfully opened, the first record in the data set is displayed with the cursor positioned at the first position of line 3. You are ready to start loading formats to be converted.

Diskette is Volume-Protected (05-01)



1. Enter the correct owner ID in order to access the diskette.

2. Press the Enter key.

The data set open prompt (06-82) is redisplayed with the information you entered previously. Press the Enter key. The data set is opened and the first record is displayed with the cursor positioned at the first position of line 3. You are now ready to start loading formats to be converted.

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.

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 (1 through 9 and A). (On the data entry keyboard, you must press the Alpha key to enter the character A.) 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.

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.

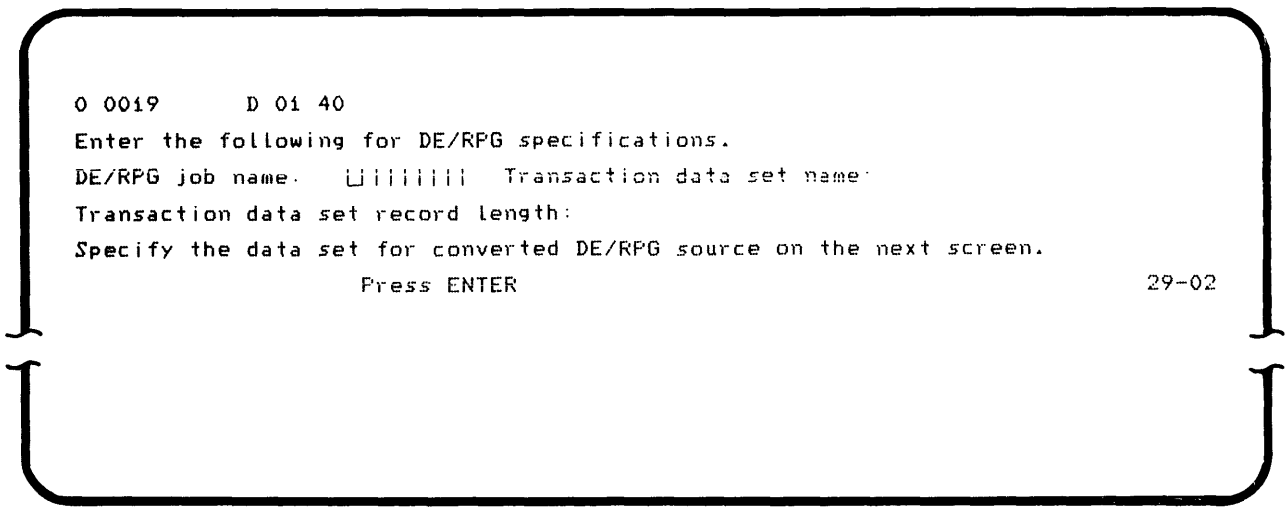
After you finish the format loading process (step 4), you are ready to begin converting formats. The specify DE/RPG job name prompt (29-02) is displayed.

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:



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.

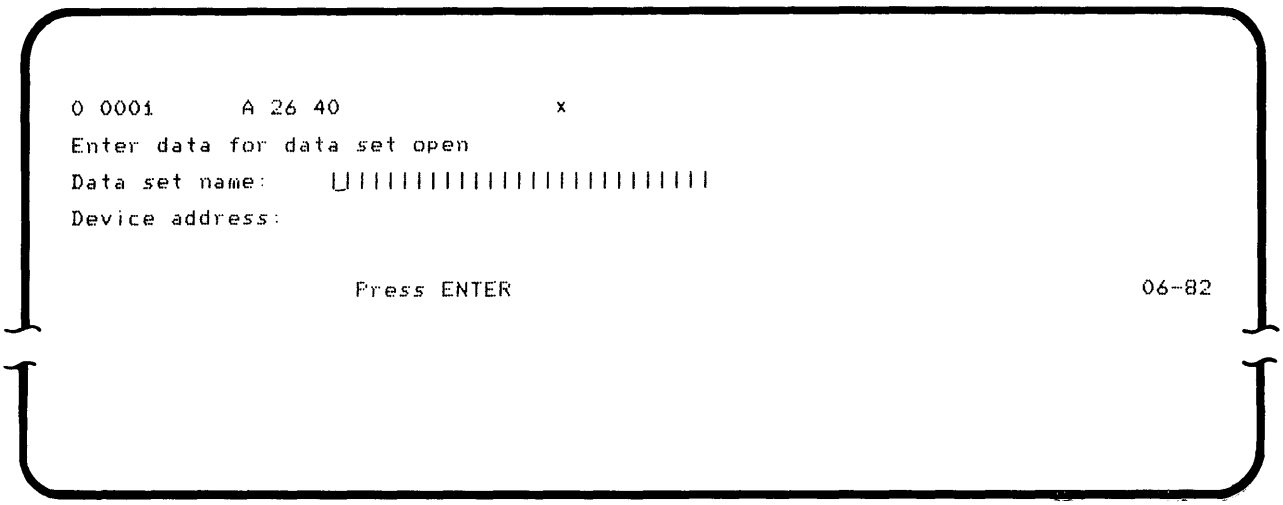
3. Enter the record length for the transaction data set. The record length can range from 1 through 128 characters. This record length will be inserted in the first two A specifications. This length also determines how many positions of the loaded formats will be converted. For example, if 32 is specified, 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.

Open the DE/RPG Source Data Set (06-82)

After you respond to the job information prompt, the following prompt is displayed:



1. Insert the diskette that will contain the generated DE/RPG source data set into a diskette drive.

2. Enter the name of the data set and the device address of the diskette drive.

3. Press the Enter key.

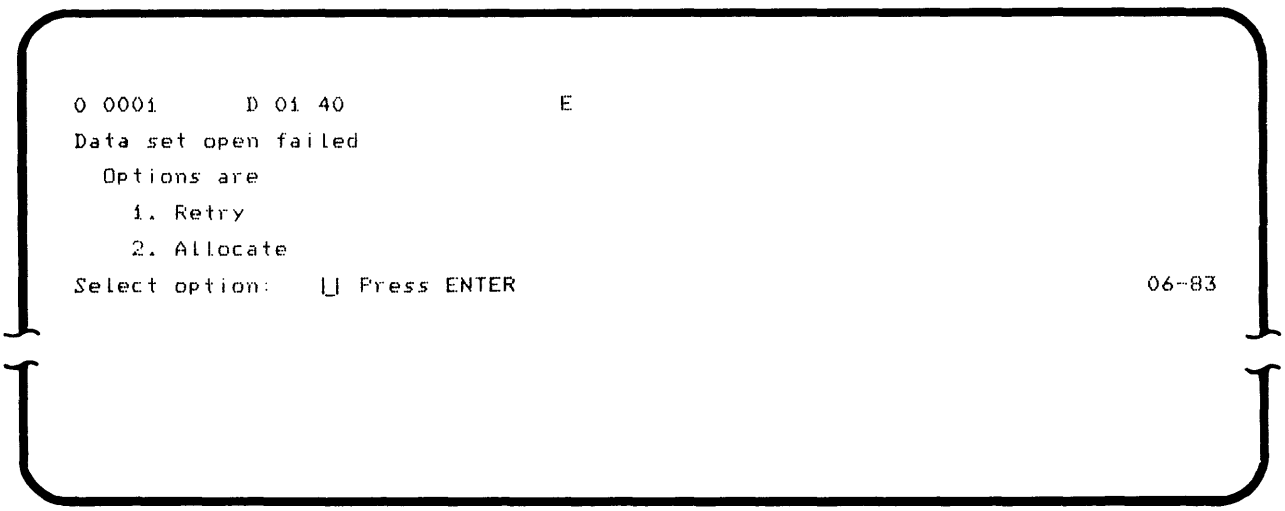
If the diskette is volume-protected, the volume-protected prompt (05-01) is displayed. Enter the owner ID and press the Enter key to continue the utility.

If the data set is not found on the diskette, the data set open failed prompt (06-83) is displayed.

If the data set is successfully opened, the conversion begins and the conversion in process prompt (29-03) is displayed.

Data Set Open Failed (06-83)

If the data set is not found on the diskette, the following prompt is displayed:



1. Enter a 1 to retry the open or a 2 to allocate space for the data set.

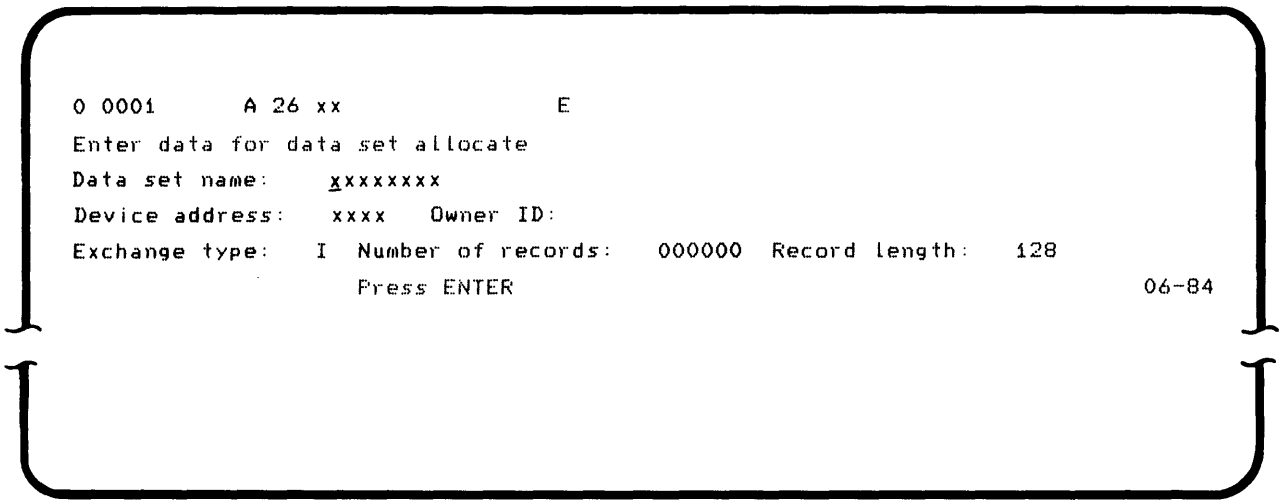
2. Press the Enter key.

If you enter a 1 to retry the open, the data set open prompt (06-82) is redisplayed. At this time, you can enter a different the data set name or device address, or insert a different diskette.

If you enter a 2 to allocate the data set, the allocate prompt (06-84) is displayed.

Allocate Data Set Space (06-84)

If you enter a 2 (allocate) for the data set open failed prompt, the following prompt is displayed:



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).

3. The default exchange type (I exchange).

4. The default value for the number of records (000000).

   Note: 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.

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 Chapter 1 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 * Number of buffers loaded) + (3 * total number of fields)

(b) To calculate the exact number of records, use the following chart:

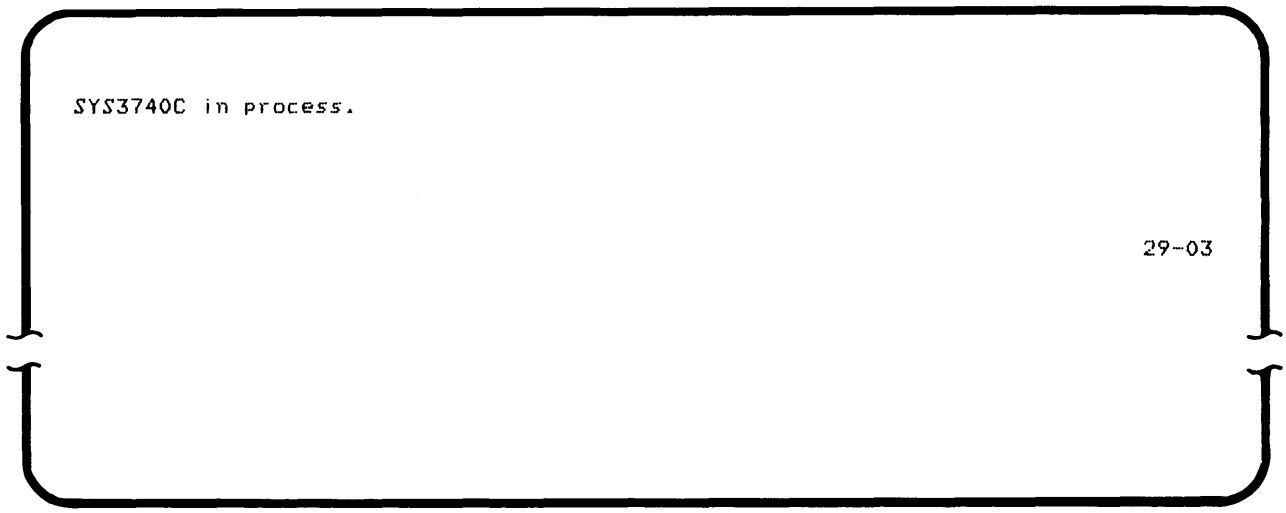
Description	Spec	Number of Records Required
Job specification	Z	1
Format specification	Z	1 for each buffer loaded with a 3740 format
Data set statement	A	2
Comment lines	A	4 for each format or prompt buffer loaded
Record statement	A	1 for each buffer loaded with a 3740 format
Field statement	A	1 for each field
If a field totals field		Add 1
If a field totals readout and reset field		Add 1 if field length is ≤ 15, add 2 if field length is 16-77, add 3 if field length is 78-113, add 4 if field length > 113
If a picture field		Add 1 if field length is ≤ 29, add 1 for each additional 35 positions
If there is a prompt for this field		Add 1 if the prompt length is ≤ 31, 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:



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 a 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:

```
0 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* in this chapter.

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* in this chapter.

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.

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.

Appendix. 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*
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*Not available

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.

allocation: Assigning space on a diskette for a data set.

alternative 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: 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 diskette 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.

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: On a diskette, an organized collection of related data records treated as a unit.

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 5280 system.

default value: A value automatically chosen by the system when a value is not specified by the user.

device address: The characters used to identify a device such as a diskette drive or printer.

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.

IPL: See *initial program load*.

IPL diskette: A diskette used for the initial program load (IPL).

initial program load: A sequence of events that loads the system programs and prepares the system for execution of jobs.

logical identifier: A 2-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.

menu: A displayed list of items from which the operator makes a selection.

multivolume: A data set that uses more than one diskette 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 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.

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.

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.

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