

Customer Support Functions

Volume II

The IBM logo, consisting of the letters 'IBM' in a bold, sans-serif font, with each letter formed by eight horizontal stripes.

System/23

Customer Support Functions

Volume II



System/23

Third Edition (May 1982)

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About this book

This manual contains information about Customer Support Functions that are used to perform specialized tasks on the System/23. The functions described in this manual include:

- | | |
|---------------------|---|
| RECOVER | Used to reconstruct information that is contained on a damaged <i>diskette</i> or in diskette files that have been accidentally dropped or freed. |
| SORT | Used to produce an output file of records sorted in a specified order. |
| PRESORT | Used to make information ready to be sorted. |
| INDEX | Used to create an index file to be used in the key-indexed access method of retrieving records from a master file. |
| COLSEQ | Used to change or load a collating sequence into the computer. |
| LISTFILE | Used to list the records of a file. |
| LISTSTOR | Used to list the storage of a BASIC program. |
| LISTDISK | Used to list the files in a disk volume or diskette. |
| DISK.RECOVER | Used to reconstruct information contained in <i>disk</i> files that have been damaged or disk files that have been accidentally dropped or freed. |

This manual also contains the step-by-step procedures required to use the functions and examples that are provided to illustrate how a function is invoked and the screens that are used to support it. It is assumed that you have completed *Learning to Use System/23* and that you are familiar with the operation of the System/23.

About this book

If you have a disk unit, it is also assumed that you have completed the training in Chapters 1 and 2 of *Using Your 5247 Disk*.

The *Customer Support Functions*, Volume II, manual contains the following chapters and appendixes:

Chapter 1, "General information," contains general information about the Customer Support Functions included in this manual. It also contains information about procedure files.

Chapter 2, "RECOVER (Diskette)," contains information about the RECOVER function which is used to reconstruct data in dropped or freed files and on diskettes that have been damaged.

Chapter 3, "SORT and PRESORT," contains information about the SORT and PRESORT function which is used to rearrange records in a file.

Chapter 4, "INDEX," contains information about the INDEX function which is used to create an index file for use in accessing key-indexed files.

Chapter 5, "COLSEQ," contains information about the COLSEQ function which is used to change or load a collating sequence into the computer.

Chapter 6, "LISTFILE," contains information about the LISTFILE function which is used to list the records of a file sequentially or by keys.

Chapter 7, "LISTSTOR," contains information about the LISTSTOR function which is used to list the storage information about a program in which an error condition occurred.

Chapter 8, "LISTDISK," contains information about the LISTDISK function which is used to list information about disk volumes, diskettes, or files.

Chapter 9, "DISK.RECOVER," contains information about the DISK.RECOVER function which is used to reconstruct information in a damaged disk file or a disk file that was accidentally dropped or freed.

Appendix A, "Collating sequence table."

Appendix B, "LABEL and RECOVER abbreviations."

It is assumed that you will use the Customer Support Functions described in this manual to perform specialized tasks on the computer. It is also assumed that persons using these functions have a knowledge of programming or that they will be assisted by someone who has a knowledge of programming and programming techniques.

About this book

Related Publications

The *Customer Support Functions, Volume I*, manual contains information about those functions that are frequently used in the daily operation of the computer. The functions described in Volume I are:

- PREPARE
- REPLACE
- COPY
- SELECT
- LABEL
- UPDATE
- RECOVER (dropped or freed diskette files)
- ADD.DELETE
- BACKUP.RESTORE
- PREPARE.DISK
- DISK.RECOVER (dropped or freed disk files)

The *System Messages* manual contains the error codes and their explanations that are displayed on the System/23 status line during operation.

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SECRET

Chapter 1. General information

Introduction

The Customer Support Functions supplied by IBM help you perform a variety of tasks. Some of these functions, such as COPY and PREPARE, are used on a day-to-day basis. These Customer Support Functions are described in Volume I. Others, such as PRESORT, SORT, INDEX, and RECOVER, have more specialized uses. These Customer Support Functions are described in this volume.

To most effectively use the Customer Support Functions described in this volume, it is helpful to have some knowledge of programming.

What this volume contains

This volume describes the following Customer Support Functions:

<i>Filename</i>	<i>Function</i>
PRESORT	Prepare Sort—Helps you to prepare the information that SORT requires.
SORT	Sort—Produces an output file of records sorted in the order you specify.
INDEX	Create Index File—Creates an index file so that you can use the key-indexed access method to retrieve records from a master file.
COLSEQ	Change Collating Sequence—Loads or changes a collating sequence in your system.

General information

Introduction (continued)

RECOVER	Recover Diskette—Helps you recover information from a defective diskette or from a diskette with files that were accidentally dropped or freed.
LISTFILE	List Files—Helps you investigate the records in a file.
LISTSTOR	List Storage Information—Helps you examine the condition of the machine and the program that is running when a problem arises.
LISTDISK	List Information—Helps you obtain information about a disk volume or diskette or about files on a disk volume or diskette.
DISK.RECOVER	Recover Disk—Helps you recover information from a damaged disk file or from a disk file that was accidentally dropped or freed.

Before you begin

If you have not read the General information chapter of *Customer Support Functions*, Volume I, you should review it before continuing. The General information chapter contains important information that applies to all Customer Support Functions *except SORT*.

SORT is the only Customer Support Function that is not started with the LINK command. This is important to remember because you will get an error if you try to LINK SORT. Also, SORT is not operated in the same way as the other Customer Support Functions—there are no screens and no prompting. Chapter 3 explains how SORT is started and how to use it.

If you have already reviewed the General Information chapter of Volume I, you will know:

- How to start a Customer Support Function (except SORT) and how to end it
- The layout of the Customer Support Function screens and the meaning of screen numbers
- How to use information already filled in on the screens
- How to use ? to get help
- How keys are used in the Customer Support Functions
- How to correct errors

General information

How to use this book

The rest of this chapter gives general information about the Customer Support Functions covered in this volume. This chapter also explains how to set up procedure files for using certain Customer Support Functions.

Each of the following chapters describe one Customer Support Function—except the SORT and PRESORT chapter. SORT and PRESORT are in the same chapter because they are so closely related.

Each chapter contains:

- Overview information about what the Customer Support Function does and when to use it.
- Detailed reference information to tell you about the various uses for the Customer Support Function.
- One or more examples of using the Customer Support Function.
These examples show the sequence of screens and explain how to make your entries on the screen.
- The screens for the Customer Support Function in numeric order. Be aware that these screens are not necessarily in the sequence that they appear when you are using the function. The screens are in numeric order for ease of reference.

Getting started

To start using a function quickly, you may want to just read the overview section and examples first. Then you can start the function and let the screens guide you in making your entries.

When the menu is displayed, you may want to select option 1 if this is the first time you are using the function. Option 1 gives you two or more screens describing the function.

After you select an option, fill in the information requested on the screen. If you are not sure what to do, try one of the following:

- Position the cursor at the field in question, type ? and press the Enter key. Additional information will be displayed.
- Look at the number in the upper right corner of the screen. Find the screen number in the "Screens" section of the chapter, and read the description of how to answer the prompt. You may also find the answer to your question in the screens shown in the "Examples..." section.
- If you are still not sure what to do, you can press Cmd and 9 (on the keypad to the right of the keyboard). This will redisplay the menu. You can then select another option or select 9 to return to READY INPUT.

You may want to use Cmd and 9 to cancel the function for any number of reasons. For example, you might need to PREPARE a diskette to use for output or use the DIR command to find out what is on your diskette. You might simply need more information before you can continue using the function.

For Customer Support Functions that are used often, you will quickly become familiar with how to enter the required information. For other more complex functions, you will probably need to use the reference information in this volume.

General information

Using a procedure file

Some of the Customer Support Functions can be run from a *procedure file*. A procedure file is a display file (type 05) that can contain BASIC statements and commands, as well as your input data.

Using a procedure file can be very convenient. If you set up your procedure files properly, you can run a function without intervening to answer prompts or insert diskettes. The function gets the information it needs from the procedure file on the diskette or disk rather than from your keyboard entries.

The Customer Support Functions that can run from a procedure file are:

- Prepare diskette (PREPARE)—diskettes only.
- Copy (COPY).
- Display diskette labels (LABEL)—diskettes only.
- Create index file (INDEX).
- Replace Customer Support Function (REPLACE).
- Change collating sequence (COLSEQ)—Only option 4 (Load a collating sequence) can be run from a procedure file.
- Sort (SORT)—SORT is not run from a procedure file in the same way as the other Customer Support Functions. Chapter 3 explains how to run SORT from a procedure file. (PRESORT cannot be run from a procedure file.)
- Add or delete a volume (ADD.DELETE)—disk only.
- Backup and Restore (BACKUP.RESTORE)—disk only.

The following Customer Support Functions can also run from procedure files, but they require no keywords and the ENDLINK statement should *not* be used.

-
- Load machine update (UPDATE)
 - Select machine update (SELECT)
 - Prepare disk (PREPARE.DISK)

The chapters that cover each of the preceding Customer Support Functions give specific information on how to run them from a procedure file. The rest of this chapter gives you general information about setting up procedure files and using them to run the functions.

Procedure file keywords and statements

To run a function from a procedure file, you enter the necessary statements from the keyboard and save them in a file. Then you use the PROC command to start processing the statements:

```
PROC procedure-filename
```

For example, suppose you want to create a procedure file to print all the labels for a diskette in drive 1. These are the statements and commands you would enter:

```
clear data
auto
00010:link label
00020:choice=2
00030:drvno=1
00040:display=y
00050:endlink
00060:
save proc.labels//1
```

(The meanings of the *keywords*, such as CHOICE= are described later in this chapter.)

General information

Using a procedure file (continued)

Once the statements are saved on the diskette, you can use the procedure file to print all the labels for any diskette. Simply enter:

```
proc proc.labels//1
```

The DISPLAY=Y statement causes the procedure file screen to be displayed. (This statement was used in this example to show you a sample procedure file screen.) More about the DISPLAY keyword is in the section "Procedure file keywords."

The following is the LABEL procedure file screen:

Display Diskette Labels Procedure File

07-219

CHOICE

MESSAGES

2

PRINTER

10

DRVNO

VOLID

FILENAME

Cmd 9 Cancel

Procedure file keywords

Before you can create a procedure file, you need to know the keywords that correspond to the prompts you answer on the screen. For example, most Customer Support Functions have the following prompts:

```
Information and messages to:
  1-Screen only
  2-Screen and printer
  3-Printer only
  2
Printer number
  10-First printer
  11-Second printer
  10
```

The keyword that corresponds to the first prompt is **MESSAGES**. If you wanted your output printed only, the procedure file statement would be **MESSAGES=3**. The keyword that corresponds to the second prompt is **PRINTER**. If you wanted to use the second printer, the procedure file statement would be **PRINTER=11**.

Each Customer Support Function that can run from a procedure file has a section (at the end of its chapter) that shows the procedure file screen and keywords. The exceptions are **UPDATE**, **SELECT**, **SORT**, and **PREPARE.DISK**.

General information

Using a procedure file (continued)

The following keywords are common to most Customer Support Functions that run from a procedure file. (The exceptions are SORT, UPDATE, SELECT, and PREPARE.DISK.)

Mode. The mode of operation can be either attended (MODE=A) or unattended (MODE=U).

In attended mode, you are given the chance to make corrections if certain errors occur.

If an error occurs in unattended mode, you cannot make corrections. You can correct the procedure file and run it again, but you cannot use the PROC error screen to make the corrections. After an error, the next statement in the procedure file that will be processed is the statement immediately following the ENDLINK statement.

If you do not include this keyword in the procedure file, the system uses attended mode. The system also uses attended mode if you specify an invalid value for MODE (like MODE=Q).

Display. If you specify DISPLAY=Y, the procedure file screen is displayed.

Note: If you use DISPLAY=Y in the procedure file, you will get a 7021 error code on the procedure file screen—even though there is really no error. If you use DISPLAY=Y and you get an error, you may see the procedure file screen twice—once with the 7021 error before processing is started, then with the real error code.

The procedure file screen shows all the keywords and the values you specified. This allows you to:

1. Press Error Reset.
2. Change any keyword values on the screen.
3. Press Enter to resume processing.

Any changes you make to values on the screen do not change your procedure file statements. The changes are in effect only for this run of the procedure file.

If you specify DISPLAY=N, the procedure file screen is displayed only if certain errors occur and MODE=A.

If you do not include this keyword in the procedure file, the system uses N. The system also uses N if you specify an invalid value for DISPLAY (like DISPLAY=1).

The DISPLAY=keyword is not displayed on the procedure file screen.

Messages. This keyword gives the same information as the following prompt.

```
Information and messages to:  
1-Screen only  
2-Screen and printer  
3-Printer only  
2
```

You can specify MESSAGES=1, MESSAGES=2, or MESSAGES=3.

If you do not include this keyword in the procedure file, the system uses MESSAGES=2.

General information

Using a procedure file (continued)

Printer. This keyword gives the same information as the following prompt:

Printer number	Required when
10-First printer	printer used
11-Second printer	
<u>10</u>	

You can specify PRINTER=10 or PRINTER=11.

If you do not include this keyword in the procedure file, the system uses PRINTER=10.

Choice. This keyword gives the same information as your Choice entry on the option menu.

For example:

Create Index File Menu

04-010

Choose one of the following:

1. Description of Create Index File
2. Create Index File

9. End Create Index File

Choice

2

In this case the only valid keyword value is 2.

For all Customer Support Functions that run from a procedure file, 1 and 9 are invalid keyword values for CHOICE.

LINK, ENDLINK, and CONT

The LINK command is the first in the sequence of statements to run a Customer Support Function from a procedure file. ENDLINK indicates the end of that sequence of statements. CONT (Continue) indicates the end of one *cycle* of a Customer Support Function. This means there are more input statements to be read for that same function.

Example of using CONT. For example, suppose you wanted to do three COPY operations:

- Copy one file named TEST.MASTER to an output diskette
- Copy a group of files having the prefix ATEST to an output diskette
- Copy a display file named MYPROC to the printer

Assume that COPY is on the same diskette as your input files. The following example shows what you could enter to do those jobs.

General information

Using a procedure file (continued)

```
clear data
auto
00010:link copy
00020:choice=2
00030:indrvno=1
00040:outdrvno=2
00050:infilename=test.master
00060:cont
00070:choice=2
00080:indrvno=1
00090:outdrvno=2
00100:infilename=atest*
00110:cont
00120:choice=5
00130:indrvno=1
00140:infilename=myproc
00150:endlink
00160:
save proc.copy3//1
```

After your procedure file is saved, you can use the PROC command to run the jobs.

```
PROC proc.copy3//1
```

LINK starts the COPY function. CONT indicates that another COPY operation follows. ENDLINK indicates the end of statements for copy to process. If there are no errors, the system will show READY INPUT on the status line. If an error occurs, the status line will show LINK with an error code and action code.

Example of creating and using a procedure file

The following example shows how to:

- Enter the statements and commands for the procedure file
- Save this data in the procedure file
- Start processing the procedure file data through the PROC command

The sample procedure file might be used to run a BASIC program for updating an inventory file. SORT is then used to sort the updated file, and LABEL and COPY are used for backup purposes.

Start by typing CLEAR DATA and AUTO. As line numbers appear, you can enter the statements as shown:

```
clear data
auto
00010:LOAD invent.update
00020:RUN
00030:SORT inv.srt.cntl.fil
00040:LINK LABEL
00050:CHOICE=2
00060:VOLID=invmas
00070:ENDLINK
00080:LINK COPY
00090:CHOICE=4
00100:INVOLID=invmas
00110:OUTVOLID=invbac
00120:REPLDISKINFO=y
00130:ENDLINK
00140:
```

General information

Using a procedure file (continued)

After you enter the last statement, and a new line number is displayed, press the Scroll-up key. Then, you can save the statements in a procedure file. Name the procedure file `proc.inv.update` and save it on a diskette in drive 1. Enter:

```
save proc.inv.update//1
```

To save the procedure file on the disk, enter:

```
save proc.inv.update/the VOLID/5
```

Once the procedure file is on the diskette or the disk, you can run it whenever needed by using the PROC command. If the file is on a diskette, enter:

```
proc proc.inv.update//1
```

If the file is on the disk, enter:

```
proc proc.inv.update/the VOLID/5
```

Modifying a procedure file. If you need to change any information in the procedure, you can:

- Load it—Load procedure filename, data
- Make your changes
- Use the REPLACE command to replace the procedure file with the updated procedure file

Handling procedure file errors

The way errors are handled in procedure file processing depends upon how the file is set up.

Attended mode and unattended mode. If the Customer Support Function in a procedure file is running in unattended mode (MODE=U), any error will end processing of the Customer Support Function. The system returns to LINK status with the error code and action code on the status line. The exception to this is the procedure file that contains PROCERR RETURN. (PROCERR is described in *BASIC Language Reference*).

If the procedure file runs in attended mode (MODE=A), most errors will cause display of the procedure file screen. Then you can make corrections on the screen to allow processing to continue. Remember, correcting the errors on the screen does not change the statements in your procedure file.

When to use attended mode. Suppose you are creating a large procedure file that will be run in unattended mode on a regular basis. It is recommended that you run this procedure file in attended mode until it is tested and is error-free. Running in attended mode will make it much easier to find your errors. Once the file is error-free, you can run it in unattended mode.

Another use for attended mode is to give you a way to run a Customer Support Function without going through a whole sequence of prompting screens. A procedure file with just LINK csfname, DISPLAY=Y, and ENDLINK in it would cause the procedure file screen to be displayed. Then you can press Error Reset and make all your entries on one screen.

When errors occur in attended mode. Most errors that occur in attended mode allow you to make corrections on the screen. Exceptions are the same errors that would cause unsuccessful completion when running the function from the keyboard. These types of errors are handled as they would be

General information

Using a procedure file (continued)

in unattended mode—return to LINK with an error code and action code on the status line.

For errors that you can correct on the screen, the field in error is usually displayed in reverse image. Sometimes the field in error cannot be determined. In such cases, the CHOICE field is displayed in reverse image. If your CHOICE entry is valid, you will know that something else is wrong in your procedure file. For example, if you misspell a keyword, the cursor cannot be positioned at the field in error. To continue, you can correct any entries on the screen. Then, examine the statements in your procedure file and correct the problem.

Some error codes (7020–7025) are unique to procedure file processing. These error codes are described in *System Messages*.

Summary of hints, considerations and restrictions

Keep the following in mind when you are preparing and using procedure files:

- RECOVER, PRESORT, LISTDISK, LISTFILE, LISTSTOR, and DISK.RECOVER cannot be run from a procedure file.
- Only option 4 (Load a collating sequence) of COLSEQ can be run from a procedure file.
- To run UPDATE or SELECT from a procedure file, you only need a LINK UPDATE or LINK SELECT command in the file. Any keyword values needed are predefined.
- To run SORT from a procedure file, you only need the SORT control-filename command in the file.
- To run multiple cycles of a Customer Support Function, use CONT between each set of statements for that function.
- If you use DISPLAY=Y in the procedure file, you will get a 7021 error code on the procedure file screen—even though there is really no error. If you use DISPLAY=Y and you get an error, you may see the procedure file screen twice—once with the 7021 error before processing is started, then with the real error code.
- Blanks are not allowed between a keyword, the equal sign, and the value that follows it. Blanks can precede the keyword.
- To put a comment on a statement, leave a blank between the keyword value and the comment.

General information

Using a procedure file (continued)

- If a keyword appears more than once in a set of statements, the last one entered is used. For example, if you enter the following keywords, drive 2 will be used.

```
DRVNO=1  
VOLID=TEST2  
DRVNO=2
```

- Keywords may be specified in any order.

Chapter 2. RECOVER (Diskette)

Introduction

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), RECOVER is on diskette VOL001.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

Recover Diskette (RECOVER) helps you reconstruct information on a *diskette* when:

- You get read errors (such as 4004–4007 or 4108) because the diskette has defective labels or data.
- You accidentally drop or free a file.

RECOVER can restore all or part of the information depending on the type of problem. This is explained in detail later in this chapter. Be aware that it is up to you to check the recovered data to ensure that it is correct.

Note: Use RECOVER for diskette files only. Use DISK.RECOVER to recover disk files.

Damaged diskettes

A damaged diskette is one that has been physically damaged or one on which the magnetic pattern of bits has been disrupted. A diskette can be damaged by a scratch or foreign substance on its recording surface, by warping, or simply by the recording surface wearing out from a lot of use. The bit pattern is most often disrupted by exposing the diskette to a magnet.

When a diskette is damaged, you can get different kinds of read errors. You may get read errors (such as 4004–4007) on the labels. In this case, you would use the “Recover Labels” option of RECOVER. You may get read errors (such as 6000–6006) on data in one of your files. In this case, you would use the “Recover a file” option of RECOVER.

RECOVER (Diskette)

Introduction (continued)

Dropped files

When you DROP a file, the space reserved for that file is still reserved. However, the system cannot access the records. This is because the label for the file indicates the file has 0 records. RECOVER can fix this by changing the label. Recovering a dropped file is described in more detail later in this chapter.

You can use the DIR command to tell if a file has been dropped. Figure 1 shows the output of the DIR command.

```
SISL1  1  0028672 0016 0000 512
09 CREATE.FILES          0010240 0010240 0012
04 VEN.MAS.ORG           0001024 0000640 0001
04 ITEM.MAS.ORG          0001024 0000000 0001
07 ITEM.IDX              0000512 0000512 0001
07 ITEM.IDX.VEN          0000512 0000512 0001
07 VEN.IDX               0000512 0000512 0001
```

(Filename)	(Space reserved in bytes)	(Space used in bytes)
------------	------------------------------	--------------------------

Figure 1. Using DIR to find a dropped file

For example, if the file named ITEM.MAS.ORG was dropped, the number 0001024 would be all zeros.

Freed files

When you FREE a file, the space reserved for it is made available for other files. Suppose you discover immediately that you have accidentally freed a file. This makes recovery easy because there is no chance that new files were created or records added to a file after you freed the file. You can reconstruct the file exactly as it was because the space has not been allocated to another file.

If, however, you create new files after you accidentally free the file, the space might be allocated to one of your new files. In this case you can still recover the file, but it may not contain all the data you expect. After you examine the recovered file, you can take the steps necessary to restore any data that was lost.

You can tell if a diskette has any freed files by running Display Diskette Labels (LABEL). LABEL gives you the label information for a freed file, along with a message saying "This label is for a freed file." LABEL is described in Volume I of the *Customer Support Functions* manuals.

For more details on the DROP and FREE commands, see the *BASIC Language Reference*.

RECOVER (Diskette)

Introduction (continued)

Making diskette recovery easy

There are several steps you can take to make diskette recovery easier, namely:

- Use COPY to make backup copies of important files. This eliminates the need to use RECOVER.
- Keep current listings of LABEL output for all labels on all your diskettes.
- For System/23 diskettes, create duplicate file labels for your files.

Making backup copies. You should use COPY to backup your diskettes that contain important files. Keep the backup diskettes in a safe place, away from the diskettes you use every day. Then, if the original diskette becomes unusable, you can use the backup. In this instance, you do not need to use RECOVER.

Keeping current LABEL output. You should periodically use Display Diskette Labels (LABEL) to print the labels that are on all your diskettes. You need information from the LABEL output to recover a label and certain dropped or freed files. The more up-to-date and accurate the LABEL output is, the better your chances of successfully recovering the label or the records in a dropped or freed file.

Creating duplicate labels. If you are using System/23 format diskettes, you can create duplicate file labels for file types 04 and 05; this means that the diskette has two file labels for a file. To create a duplicate file label, include RECOVER=YES in the OPEN statement to create the file, as shown here.

```
OPEN #1:NAME=NEWFILE//1,SIZE=0,RECL=512d.512,  
RECOVER=YES,INTERNAL,OUTPUT
```

This statement creates two file labels for the file named NEWFILE. If the primary file label becomes unusable, you can run RECOVER and label recovery automatically recovers the file label using the duplicate. You do not have to answer any RECOVER prompts for that file label and you do not need the LABEL output.

The advantage of using duplicate file labels is that recovery is easy. However, duplicate file labels use twice the amount of space in the file label area. This reduces the amount of space available for use by your files.

RECOVER (Diskette)

Introduction (continued)

Using RECOVER

RECOVER is easy to use, especially if you just drop or free a diskette file and use RECOVER right away. After you enter the LINK RECOVER command, the RECOVER screens explain what you need to do. This chapter contains reference information to help you when you are not sure what to do.

Keep the following in mind when you are using RECOVER:

- If you *drop* a file and want to recover it, you only need the diskette containing the dropped file.
- If you *free* a file and want to recover it, you need the diskette with the freed file and an output diskette. RECOVER copies the freed file to the output diskette to recover it.
- If you get read errors on labels, you will need the diskette with the read errors and an output diskette. RECOVER copies the damaged diskette to the output diskette to recover it.
- If you get read errors on data in a file, you have a choice of recovering the data on the same diskette or recovering to an output diskette.
- If you are running label recovery, you will probably need current listings of label information (the printed output from LABEL). These listings are also helpful in dropped file recovery. (This is explained under "Recovering a dropped Basic or H Exchange file" on page 2-17.)

-
- If you are unsure about how to respond to a prompt on a screen, don't forget that you can use the ? to get help. The description screens (option 1 on the menu) also provide information about RECOVER.
 - If you want to stop RECOVER, use the Cmd key and the 9 on the numeric key pad to go back to the main menu.
 - RECOVER cannot be used from a procedure file.

RECOVER (Diskette)

Functions of RECOVER

RECOVER can be used to:

- Allow the system to read a diskette when its volume or ERMAP label cannot be read.
- Re-create a file label that the system cannot read.
- Find sectors that cannot be read correctly because of a defective area on the diskette and rewrite the sectors that can be read.
- Restore a dropped or freed file to usable status.

For all functions except recovery of a dropped file, RECOVER copies a file or an entire diskette.

Running label recovery

Label recovery is option 2 on the RECOVER menu. You should run it if the system cannot read a label. Label recovery will always image copy your diskette. This is done whether or not a read error is found on a label. Before the image copy is started, RECOVER reads the error map (ERMAP) and volume label.

If a read error occurs on either of these labels, you will need the LABEL information for these labels. RECOVER will ask you to enter the ERMAP and/or volume information from your LABEL output.

If the system cannot read a label, an error occurs. You should look up the error code in the *System Messages* book to find out as much as you can about the error before you run RECOVER.

If RECOVER finds a read error in a data sector, some of the file recovery screens may appear. After the diskette is copied, RECOVER ends.

RECOVER cannot be run for an access-protected diskette except in one case. If the volume label for an access-protected diskette has a read error, you can run RECOVER on it. This is because it cannot be determined that a diskette is access-protected if the volume label is bad.

RECOVER (Diskette)

Running label recovery (continued)

Before you begin

You need the output created by Display Diskette Labels (LABEL) to answer many of the prompts for label recovery. It is recommended that you run, at frequent intervals, option 2 of LABEL (display all labels) and keep the output.

You need a prepared diskette for the output of label recovery.

It is recommended that the diskette you provide for the copy be newly prepared (see the PREPARE chapter in Volume I).

Operating considerations

Keep these things in mind as you run label recovery:

- RECOVER copies the entire diskette to a prepared output diskette.
- You may see some of the same screens as you see when using Recover a file.
- If RECOVER does not complete successfully after the in-progress screen appears, you should PREPARE the output diskette.

If RECOVER does not complete because you pressed Cmd 9 or Cmd Attn, you should PREPARE the output diskette.

Preparing the diskette is necessary in both of the above cases because the output diskette may no longer be recognized as a valid Basic, H Exchange, or System/23 diskette.

Running file recovery

File recovery is option 3 on the menu. You should run it if the system cannot read data in a file. You should look up the error code in the *System Messages* book before you run RECOVER.

The result of running file recovery is a new copy of the file that the system can read without finding any errors. Even if the file does not have errors, RECOVER still copies it. If RECOVER finds sectors with read errors, it writes out blanks instead of copying the sector.

After file recovery successfully completes, it is up to you to put the missing data into the new copy of the file. You can do this using a BASIC program. RECOVER provides screens that identify the sectors containing errors and the records in those sectors.

You can run file recovery only for file types 01, 02, 04 and 05. This means you cannot use RECOVER for index files (type 07 and 08). You cannot recover a file that is on an access-protected diskette.

Before you begin

The file being recovered and the copy of it made by RECOVER can be on the same or a different diskette. If the file is to be copied to a different diskette, it must be the same format (Basic Exchange, H Exchange, or System/23 format) as the input diskette. You should have the output diskette ready when you load RECOVER.

RECOVER (Diskette)

Running file recovery (continued)

Operating considerations

During file recovery, RECOVER reads each sector of the file. If it encounters a read error, it shows you, on the screen:

- The relative record numbers of records in the sectors which have errors. For display files, the number of the sector in which the record is found, *not the relative record number* is displayed. The sector number is displayed because the file records are variable length records. If a particular sector is in error, the indicator for the end of a record may not be readable or may be incorrect.
- If possible, the data in the sector in both its internal (hexadecimal) and graphic (EBCDIC) representation. Some or all of this data may be incorrect.
- The data in the sectors before and after the error sector(s).

The screens that provide this information do not require that you answer any prompts. If possible, you should print these screens. They will help you to reconstruct the records that have errors. RECOVER lets you select options to print this output.

A sector that has a read error is written to the output file as all blanks. Although only some of the data in the sector may be incorrect, the entire sector is written as blanks. Figure 2 shows three sectors from a diskette. Each sector is 512 bytes long. The file that is on this area of the diskette contains records that are 160 bytes long. Therefore, each sector contains more than one record.

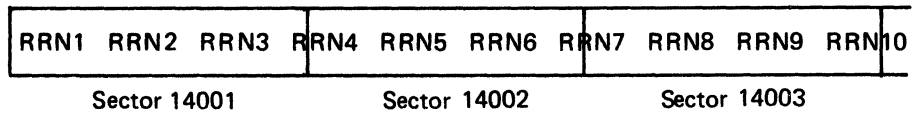


Figure 2. Recovering a sector

RECOVER (Diskette)

Running file recovery (continued)

If RECOVER finds an error on sector 14002, it copies this sector as all blanks. Therefore, the data at the end of relative record number 4 (RRN4), all of RRN5, all of RRN6, and the beginning of RRN7 is destroyed. The RECOVER screens tell you that the error sector is sector 14002 and that the first and last relative record numbers in this sector are RRN4 and RRN7. RECOVER then displays, if it can, the contents of sectors 14001 (the previous sector), 14002 (the error sector) and 14003 (the following sector).

If sectors 14002 and 14003 both have errors, RECOVER displays the contents of sectors 14001 (the previous sector) 14002 and 14003 (the error sectors), and 14004 (the following sector).

Running dropped or freed file recovery

Dropped and freed file recovery is option 4 on the menu. You should run it if you want to recover a file that was accidentally freed or dropped.

If you have just dropped or freed a file and you want to recover it, recovery is very simple. The RECOVER (Diskette) chapter of Volume I gives step-by-step instructions for recovering dropped or freed files.

If any activity on the diskette has taken place after you dropped or freed the file, you may need to refer to the information in the following sections. These sections contain detailed information on dropped and freed file recovery.

Dropped file recovery

When you drop a file, the space that was allocated to the file still remains allocated to it. However, the file label is changed to indicate that the file contains no data.

For a Basic or H Exchange file this means that the end of data pointer is set equal to the beginning of extent. For a System/23 file it means that the total record count is set equal to zero.

Since the space that is allocated to a file remains allocated when a file is dropped, the data that was in the file cannot be written over by another file. This means that if you can change the total record count or the end of data pointer to the value that it was at the time the file was dropped, you will be able to access all the records that were in the file when you dropped it.

RECOVER (Diskette)

Running dropped or freed file recovery (continued)

Option 4 of RECOVER helps you to recover a dropped file by allowing you to change the total record count or end of data value.

How dropped file recovery works

Dropped file recovery does not copy the file that is being recovered. It writes a new value which you specify on the file label. This value is for the total record count (System/23 files) or the end of data (Basic or H Exchange files).

A file does not have to be dropped in order to run dropped file recovery on that file. Dropped file recovery can be used to change the total record count or end of data pointer for any file. This is described under "Special uses for dropped file recovery" on page 2-18.

Recovering a dropped System/23 file

When a System/23 file is dropped, the value of the total record count at the time the file is dropped is saved in a field of the label called the previous total record count. When you recover a dropped System/23 file, the screen asks you to enter a new value for the total record count. This screen displays for you:

- The current value in the label for the total record count
- The previous value of the total record count
- The maximum value that is allowed for the total record count.

If the file has actually been dropped, the value shown for the current total record count will be zero. If you have just dropped the file, then you should enter the value shown for the previous total record count as the new value for the total record count. This will restore the file to be the same as when you dropped it.

However, if any activity has taken place on the file since you dropped it, the previous total record may not be the value you want for the new value of the total record count. You can enter any value between zero and the value shown for the maximum. The maximum total record count is the number of records that uses all of the space allocated to the file.

Recovering a dropped Basic or H Exchange file

When you recover a dropped Basic or H Exchange file, the screen asks you to enter a new value for the end of data. This screen displays for you the current values in the label for the beginning of extent, the end of data, and the end of extent. If this file has really been dropped, the value shown for the end of data will be the same as the value shown for the beginning of extent.

Using the listings from LABEL (Display Diskette Labels). Because the label for a Basic or H Exchange file does not have a field for the previous end of data value, you will find it very helpful if you have a current listing from running LABEL for this file. Keep the following in mind:

- If you have the LABEL listing and if you are sure that it is current, then you should enter the value shown on the listing for the end of data (EOD) as the new value of the end of data.

RECOVER (Diskette)

Running dropped or freed file recovery (continued)

- If you do not have a listing with the correct value for the old end of data, then you should enter any value between the beginning of extent and the end of extent plus one.
- If you enter a value for the end of data that is too small, the recovered file will not contain some of the records at the end of the file.
- If you enter a value that is too large, the recovered file will contain too many records. The extra records at the end of the file will contain information unrelated to this file.
- If you have no idea what value should be entered, you should probably enter a value of the end of extent plus one for the new value of the end of data. This will mean that your file has the maximum number of records allowed in the space allocated to your file. Therefore, you will have all the records that were in your file when you dropped it, and you will probably have some extra unrelated records.

It will be your responsibility to look at the data and to separate the good records from the unrelated records. You may need to write a BASIC program to do this. Also, if needed, you can run dropped file recovery again for the same file in order to try to enter a better guess for the value of the end of data pointer.

Special uses for dropped file recovery

As stated before, you can use dropped file recovery to change the total record count or end of data pointer for a file that was not dropped. For example, you might want to use dropped file recovery to recover a large file that you have accidentally written over with a much smaller file.

This could happen in the following manner. You have a large file of 1000 records named FILEA on a diskette. You write a

file of twenty records on the same diskette and choose the name FILEA, forgetting that you already have a file with that same name. By doing this, you have changed the total record count or end of data pointer. You also destroyed the data that was written over by the twenty records.

However, the space that was allocated to the old FILEA has not changed. The data that was not written over is still good, if you could only access it.

Dropped file recovery allows you to change the total record count or end of data pointer so that you can access these records again. It is your responsibility to recreate the data that was destroyed by writing the twenty records.

If the small file that you wrote does not have the same file attributes as the large file you wrote on top of, you will need to do some extra work in order to recover your file. In this case, you should:

1. Open FILEA with the file attributes that the large file should have.
2. Close it again before going on to perform dropped file recovery.

Any time you are running dropped file recovery and you are not sure what value to enter, you can enter the maximum value for the total record count or the end of extent plus one for the end of data value. This will ensure that your file contains the maximum possible number of records for the space allocated to that file. Therefore, you will be sure to have all the records that you want to recover. You will probably also have some records that do not belong to your file. Remember, it is your responsibility to verify the recovered data.

RECOVER (Diskette)

Running dropped or freed file recovery (continued)

Freed file recovery

When you free a file, the space allocated to that file becomes free to be allocated to another file. This means that the freed file can be destroyed if the space that was allocated to it is allocated to another file and is written on by that file.

The only way to ensure that the data in the freed file has not been destroyed is to perform freed file recovery immediately after the file is freed. If any activity takes place on the diskette after the file is freed and before performing freed file recovery, you cannot be assured that the data in the freed file will still be good.

Also, if any new files are created on the diskette after the file is freed, it is possible that the label of the freed file will be used again and that you will be unable to perform freed file recovery.

How freed file recovery works

When a freed file is recovered, it is copied to a new file. The output file cannot be put on the same diskette as the freed file that you want to recover. You must provide a different diskette for the output file.

Before the freed file is copied, the screen tells you whether or not any of the space that was allocated to the freed file is currently allocated to another file. You are given an opportunity to decide whether you wish to continue with recovery and copy the freed file or stop and return to the main menu.

The screen may tell you that none of the space is currently allocated to another file. Even so, you cannot be sure that all of

the data in the freed file is still good. If any activity has taken place on the diskette, it is possible that some of the space may have been allocated to another file and then freed again. You can only be certain that the data is still good if you are performing freed file recovery immediately after you freed the file.

The screen may tell you that some of the space for the freed file is currently allocated to another file. This doesn't necessarily mean that your data is destroyed. Even though the space is *allocated* to another file, it may not be *written on* by that file. If the newer file is very small but has a large amount of space allocated to it, your old data may not be written over.

If you choose to copy the freed file to a new file, you should check the data in the new file and determine what records still have valid data and what records have been destroyed and written over by another file. If you find that some records in the file have been destroyed, you can reconstruct the data that was lost. You may need to write a BASIC program to replace the records that were destroyed.

RECOVER (Diskette)

Running dropped or freed file recovery (continued)

Recovering a freed System/23 file

If the freed file you are recovering is a System/23 file and if some of the space for the freed file is currently allocated, you will be given a screen that tells you which sectors from the freed file are currently allocated to some other file. This is done by listing the beginning and ending *physical block numbers* (PBN) of the pieces of the freed file that are currently allocated.

A physical block number is an address of a sector on the diskette. The sectors are numbered consecutively starting with the first sector on cylinder one, which is assigned a physical block number of zero. Look at the output from the LABEL function for a System/23 file. The eight-digit numbers that appear on the label extents screen consist of a four-digit beginning physical block number and a four-digit number of blocks or sectors.

Verifying the data in the recovered file. If you choose to recover a freed file and copy it to a new file, remember that you cannot be certain if the data in the new file is still good. This is true whether or not any of the sectors from the freed file are currently allocated to another file. Be sure to look at the data in the new file to determine what parts of it are good and what parts you will need to reconstruct.

Examples of using RECOVER

This section contains three examples of using RECOVER:

- Recovering labels
- Recovering a file having read errors
- Recovering a freed file

Each example shows the screens RECOVER displays and how you respond to each screen.

Example 1. Recovering labels

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), RECOVER is on diskette VOL001.

Suppose you have a diskette named RECZ. You have tried to use it and you keep getting a 4108 error on the status line. You will probably not be able to use the information on this diskette again unless you use RECOVER.

You will need:

- The Recover Diskette Customer Support Function
- The diskette, RECZ, that is to be recovered
- A diskette to which RECOVER will copy your input diskette, RECZ
- Label information from running LABEL.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

RECOVER (Diskette)

Examples of using RECOVER (continued)

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), RECOVER is on diskette VOL001.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

To start RECOVER:

1. Insert the Customer Support Functions diskette into any drive.
2. Type: LINK RECOVER

After you press Enter, an option menu is displayed. Remove the Customer Support Functions diskette and enter 2 to recover labels.

Recover Diskette Menu

08-010

Choose one of the following:

- 1. Description of Recover Diskette**
- 2. Recover labels**
- 3. Recover a file**
- 4. Recover a dropped or freed file**

9. End Recover Diskette

Choice

2

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen asks how you want your message output—displayed, displayed and printed, or printed only. You only want to display this output, so type 1 and press Enter.

Recover Labels

08-332

Information and messages to:

1-Screen only
2-Screen and printer
3-Printer only
1

Printer number
10-First printer
11-Second printer
10

Required when
printer used

The next screen asks information about your input diskette. Insert RECZ into drive 1 and fill in the drive number and VOLID field as shown:

Recover Labels

08-062

Drive number
1

Optional when
VOLID provided

VOLID
RECZ

Optional when
drive provided

The next screen tells you the volume label is bad. Type the information from your volume label output exactly as shown:

Recover Labels

08-082

The volume label cannot be read.
Type in required label information from your
copy of Display Diskette Labels.

VOLID	<u>RECZ</u>
OWNERID	<u>DOOSON</u>
VOLSRF	-
PHYRLN	2
CRCNUM	<u>2B40</u>

Cmd 9 Cancel
? Help

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen asks information about your output diskette. This is the diskette to which RECOVER will copy the contents of the input diskette, RECZ. Assume you named the output diskette ZRECL3 when you prepared it. Insert your output diskette in drive 2 and fill in the drive number and VOLID fields as shown:

Recover Labels

08-092

Provide a diskette for an image copy.

Output drive number
2

Optional when
VOLID provided

Output VOLID
ZRECL3

Optional when
drive provided

INSERT DISKETTE NOW.

Cmd 9 Cancel
? Help

The next screen tells you that RECOVER is copying RECZ to the output diskette ZRECL3.

Recover Labels

08-112

Recover Diskette in progress.

The next screen shows the number of file label read errors. Just press Enter to see the next screen.

Recover Labels

08-122

Number of read errors in file label area:

1

A list of file labels read with no errors will follow.
Compare with current copy of Display Diskette Labels.
Missing labels represent file label read errors.

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen shows the good file labels. You will need the output of LABEL to know what file labels are on the diskette. You can then compare the list of good file labels on this screen to the file labels in the LABEL output. The label missing from the list of labels on the screen is the bad file label. The bad file label is for ZFILE1.

Recover Labels

08-132

File labels exist for the following files:

ZFILE2
ZFILE3
ZFILE4
ZFILE5

Press Enter to continue

Cmd 9 Cancel

The next screen asks for the name of the missing file label.
This filename is ZFILE1. After you enter ZFILE1, press Enter.

Recover Labels

08-142

To recover a missing file label type in:

Filename

ZFILE1 _____

If you leave this field blank, no further
label recovery action will be taken.

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next asks you to type in the file label information from your LABEL output for ZFILE1. Enter the information exactly as shown.

Recover Labels

08-162

Type in required label information from your
copy of Display Diskette Labels.

RCDTYP	<u>01</u>	PRVCNT	<u>000000</u>	FILTYP	<u>04</u>
RCDLNG	<u>0200</u>	KFBCNT	<u>000000</u>	WRTprt	<u>00</u>
RDCDNT	<u>000016</u>	KEYLNG	<u>00</u>	KEYPOS	<u>0000</u>
INITBK	<u>0016</u>	DUPFLl	<u>0000</u>	DATECR	<u>000000</u>
DATEUP	<u>000000</u>	NUMXNT	<u>01</u>	CRCNUM	<u>0C4D</u>

Cmd 9 Cancel
? Help

The next screen asks you to type in the label extent information from your LABEL output for ZFILE1. Enter the information exactly as shown.

Recover Labels

08-172

Type in required LABEL EXTENT information
from your copy of Display Diskette Labels,
including blank spaces.

07F4 00160016

The information from diskette RECZ is now recovered and is on diskette ZRECL3. A completion screen is displayed to let you know RECOVER was successful.

Recover Labels

08-262

Recover Diskette completed.

RECOVER (Diskette)

Examples of using RECOVER (continued)

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), RECOVER is on diskette VOL001.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

You can remove your diskettes and use the recovered diskette ZRECL3. RECZ, the damaged diskette, can be prepared so that it can be used again.

Example 2. Recovering a File

Suppose you have a file, AAA, and you are getting read errors on data in this file. You can use the "Recover a File" option of RECOVER to recover as much of the data as possible. RECOVER will make a new copy of the file that the system can read. Be aware that some of the data will be missing. For the sectors that cannot be read, RECOVER writes out blanks. After you run RECOVER, you can use a BASIC program to examine the data in your file. You should be able to determine what data is missing and restore it.

Assume you are using a 4-drive system. You will need:

- The Recover Diskette Customer Support Function
- The diskette containing file AAA
- A diskette to which RECOVER will copy the file AAA. If you wish, you can put the output file on the same diskette as file AAA.

To start RECOVER:

1. Insert the Customer Support Functions diskette into any drive.
2. Type: LINK RECOVER

After you press Enter, the option menu is displayed. Remove the VOL002 diskette and enter 3 to recover a file.

Recover Diskette Menu

08-010

Choose one of the following:

- 1. Description of Recover Diskette**
- 2. Recover labels**
- 3. Recover a file**
- 4. Recover a dropped or freed file**

9. End Recover Diskette

Choice

3

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen asks how you want your message output handled. It also asks information about the file to be recovered. You want the output displayed only. Insert the diskette containing file AAA in drive 3.

Recover a File

08-283

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only

1

Printer number

- 10-First printer
- 11-Second printer

10

Required when
printer used

Input drive number

3

Optional when
VOLID provided

Input VOLID

Optional when
drive provided

Input filename

AAA_____

Required

Cmd 9 Cancel
? Help

The next screen asks information about the file on the output diskette that you will copy file AAA to. You want to copy AAA to FILEA on a diskette in drive 4. Insert your output diskette in drive 4.

Recover a File

08-293

Output drive number
4

Optional when
VOLID provided

Output VOLID

Optional when
drive provided

Output filename
FILEA_____

Required

The next screen tells you RECOVER is copying file AAA to the output file FILEA on the diskette in drive 4.

Recover a File

08-113

Recover Diskette in progress.

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen tells you what records are included in the sector or sectors with read errors. Press Enter.

Recover a File

08-303

A data read error has been detected between and including:

First record number	7
Last record number	8

Information in internal representation and graphic form for sectors on either side of bad sector(s) will be given to help programmer reconstruct lost data. Error sector(s) data will be provided if it exists.

Note: It takes two screens to show one System/23 diskette sector. (The first screen shows the first 256 bytes. The second screen shows the second 256 bytes.)

The next screen shows the first half of the sector preceding the sector with the read error. Press Enter.

Recover a File																08-313	
Internal representation																Previous sector	50002
00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	Graphic	
0000	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	AAAAAAAAAAAAAAAA	
0010	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	40	40	AAAAAAAAAAAAAAAA	
0020	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0030	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0040	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0050	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0060	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0070	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0080	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
0090	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		

Press Enter to continue Cmd 9 Cancel

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen shows the second half of the sector preceding the sector with the read error. Press Enter.

```
Recover a File                                     08-313
                                                    50002
Internal representation      Previous sector      Graphic
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

0100  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0110  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0120  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0130  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0140  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0150  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0160  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0170  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0180  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0190  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
01A0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
01B0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
01C0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
01D0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
01E0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
01F0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Press Enter to continue                               Cmd 9 Cancel
```

The next screen shows the first half of the error sector. Press Enter.

Recover a File																08-313	
WARNING: Data may be incorrect.																50003	
Internal representation																Error sector	Graphic
00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F		
0000	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	AAAAAAAAAAAAAAAA	
0010	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	40	40	AAAAAAAAAAAAAAAA	
0020	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0030	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0040	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0050	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0060	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0070	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
0080	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
0090	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
00F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00		
Press Enter to continue																Cmd 9 Cancel	

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen shows the second half of the error sector.
Press Enter.

Recover a File

WARNING: Data may be incorrect.

Error sector

08-313

50003

Internal representation

Graphic

00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

0100	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0110	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0120	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0130	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0140	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0150	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0160	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0170	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0180	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0190	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01E0	08	08	22	8A	A0	AA	AB	FD	77	D7	BE	AB	3A	DD	5F
01F0	BA	F3	7C	D7	FF	D4	6E	9F	D9	74	F8	FF	A9	A7	CC

!<P'& 0^!
"30P M>R28 zx6"

Press Enter to continue

Cmd 9 Cancel

The next screen indicates that no data can be read from the next sector so only the sector number is displayed.

Recover a File

08-323

No data available for error sector
50004

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screens show the sector following the sectors with read errors. The first screen shows the first half of that sector; the second screen shows the second half of that sector. Press Enter.

```
Recover a File                                08-313
                                           Following sector 50005
                                           Graphic
Internal representation
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
0000  C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1  AAAAAAAAAAAAAAAAAA
0010  C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 40 40  AAAAAAAAAAAAAAAAAA
0020  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0030  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0040  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0050  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0060  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0070  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0080  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0090  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00A0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00B0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00C0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00D0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00E0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00F0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Press Enter to continue                                Cmd 9 Cancel
```

The next screen is continuation of the previous screen. Press Enter.

Recover a File

08-313

Following sector 50005
Graphic

Internal representation

00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

0100	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0110	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0120	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0130	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0140	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0150	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0160	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0170	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0180	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0190	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Press Enter to continue

Cmd 9 Cancel

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen indicates recovery is completed.

Recover a File

08-263

Recover Diskette completed.

Your file AAA data is now in file FILEA on the diskette in drive 4. You can examine the contents of FILEA and determine what information must be restored.

Example 3. Recovering a Freed File

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), RECOVER is on diskette VOL001.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

Suppose you were using the BASIC command FREE to free some files you no longer needed. Somehow you accidentally freed a file that you still need. A few days have passed and, in the meantime, you have created some new files.

When you free a file, the space allocated to it is made available for other files. Now some of the space that belonged to the file you freed has been allocated to one of your new files. (You do not know this yet but you will find out when you run RECOVER.) You will need:

- The Recover Diskette Customer Support Function
- The diskette containing the file you freed, RECOVERY.RD09
- A diskette to which RECOVER will copy the freed file.

To start RECOVER:

1. Insert the Customer Support Functions diskette into any drive.
2. Type: LINK RECOVER

RECOVER (Diskette)

Examples of using RECOVER (continued)

After you press Enter, the option menu is displayed. Remove the VOL002 diskette and enter 4 to recover a freed file.

Recover Diskette Menu

08-010

Choose one of the following:

1. Description of Recover Diskette
2. Recover labels
3. Recover a file
4. Recover a dropped or freed file

9. End Recover Diskette

Choice

4

The next screen asks how you want your message output handled—displayed, displayed and printed, or printed only. You only want to display the output, so type 1 and press Enter.

Recover a Dropped or Freed File

08-334

Information and messages to:

1-Screen only
2-Screen and printer
3-Printer only
1

Printer number
10-First printer
11-Second printer
10

Required when
printer used

The next screen asks information about your input diskette. Insert the diskette containing the file RECOVERY.RD09 in drive 1 and fill in the drive number and VOLID fields as shown.

Recover a Dropped or Freed File

08-084

Drive number
1

Optional when
VOLID provided

VOLID

Optional when
drive provided

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen asks the filename of the freed file you want to recover. Enter the filename RECOVERY.RD09.

Recover a Dropped or Freed File

08-184

If you want to recover a file that has been
DROPPed or FREEd type in:

Filename

RECOVERY.RD09

The next screen asks if you are recovering a dropped or freed file. Enter 2 to recover a freed file.

Recover a Dropped or Freed File

08-194

Choose one of the following:

1. Recover a DROPPed file
2. Recover a FREEd file

9. Return to main menu

Choice

2

The next screen warns you that some of the space originally allocated to RECOVERY.RD09 is now allocated to another file. It gives you the PBNs (physical block numbers) being used by the other file. Press Enter.

Recover a Dropped or Freed File

08-224

WARNING: The following space is being used currently.

Beginning PBN	022E	Ending PBN	022F
Beginning PBN	0230	Ending PBN	0230
Beginning PBN	0231	Ending PBN	0231
Beginning PBN	0232	Ending PBN	0232
Beginning PBN	0233	Ending PBN	0233
Beginning PBN	0234	Ending PBN	0234
Beginning PBN	0235	Ending PBN	0235
Beginning PBN	0236	Ending PBN	0236
Beginning PBN	0237	Ending PBN	0237
Beginning PBN	0238	Ending PBN	0238
Beginning PBN	0239	Ending PBN	0239
Beginning PBN	023A	Ending PBN	023A
Beginning PBN	023B	Ending PBN	023B
Beginning PBN	023C	Ending PBN	023C

Press Enter to continue

Cmd 9 Cancel

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen gives you a chance to stop processing. You want to continue and copy RECOVER.RD09 to a new file, so enter Y.

Recover a Dropped or Freed File

08-234

Some of the sectors in this file are currently allocated to another file. If you wish to continue, this file will be copied to a new file. It will be your responsibility to validate the data in the new file and to correct it if necessary.

Copy file

Y-Continue recovery

N-Return to menu

Y

The next screen asks information about the new output file. Insert the output diskette in drive 2, enter a filename FILE1, enter drive number 2 and press Enter.

Recover a Dropped or Freed File

08-294

Output drive number
2

Optional when
VOLID provided

Output VOLID

Optional when
drive provided

Output filename
FILE1_____

Required

RECOVER (Diskette)

Examples of using RECOVER (continued)

The next screen indicates recovery of your freed file is completed.

Recover a Dropped or Freed File

08-264

Recover Diskette completed.

Your file is now FILE1 on the diskette in drive 2. It is up to you to examine the data in the file and restore any data that was destroyed.

Screens

This section contains the screens that can appear while you are running RECOVER. They are shown in ascending sequence by screen number. This is not always the order in which they appear while you are running RECOVER. The order of the screens depends upon:

- The option you select on the menu (see screen 08-010)
- Your answers to certain prompts
- The format of the diskette being recovered
- Whether or not certain read errors occur.

Some screens can appear for both label and file recovery.

RECOVER (Diskette)

Screens (continued)

Menu (screen 08-010)

Recover Diskette Menu

08-010

Choose one of the following:

1. Description of Recover Diskette
2. Recover labels
3. Recover a file
4. Recover a dropped or freed file

9. End Recover Diskette

Choice

-

Select 1 to see four screens (08-021, 08-031, 08-041 and 08-051) that describe RECOVER. After screen 08-051 is displayed, RECOVER returns to this menu.

Select 2 to re-create labels that the system cannot read. If you select this option, you will probably need a copy of the output from Display Diskette Labels (LABEL).

Select 3 to find the sectors in a file that RECOVER cannot read and to rewrite the file.

Select 4 to recover a file that was accidentally freed or dropped.

Select 9 to end RECOVER. The system then returns to READY INPUT status.

RECOVER (Diskette)

Screens (continued)

Input diskette to be recovered (screens 08-062 and 08-064)

Recover Labels		08-062
Drive number		Optional when
-		VOLID provided
VOLID		Optional when
_____		drive provided

You use this screen to specify the input diskette that is to be recovered.

Drive number. Enter the number of the diskette drive that contains the input diskette to be recovered.

VOLID. Enter the name of the diskette to be recovered.

You must enter either the drive number or the VOLID.

Error map label (screen 08-072)

Recover Labels

08-072

The error map label cannot be read.

Type in required label information from your
copy of Display Diskette Labels.

DEFCL1 —
DEFCL2 —
CRCNUM —

Cmd 9 Cancel
? Help

This screens appears only if RECOVER cannot read the error map label (ERMAP) on the diskette. The error map label identifies defective cylinders, if any, on the diskette.

You need the printed output from LABEL to answer these prompts. Find the copy of screen 07-062 on the LABEL output. The three field names on it are the same as the three prompts on this screen.

RECOVER (Diskette)

Screens (continued)

Enter the information for the three prompts exactly as it appears on the LABEL output. You do not need to know what this information means. If the LABEL output is blank for DEFCL1 and/or DEFCL2, leave the input field blank on the screen. *Make sure you enter capital (uppercase) letters as they appear.*

Refer to Appendix B for explanations of data on this screen.

Volume label (screen 08-082)

Recover Labels

08-082

The volume label cannot be read.
Type in required label information from your
copy of Display Diskette Labels.

VOLID _____
OWNERID _____
VOLSRF -
PHYRLN -
CRCNUM _____

Cmd 9 Cancel
? Help

This screen appears only if RECOVER cannot read the volume label of the diskette being recovered.

You need the printed output from LABEL to answer the prompts on this screen. Find the copy of screen 07-072 on the LABEL output. The five field names on it are the same as the prompts on this screen.

RECOVER (Diskette)

Screens (continued)

Enter the data for the five prompts exactly as it appears on the LABEL output. You do not need to know what this information means. If a field on the LABEL output is blank, leave the input field blank for that prompt. *Make sure you enter capital (uppercase) letters as they appear.*

Refer to Appendix B for explanations of data on this screen.

Output diskette (screen 08-092)

Recover Labels	08-092
Provide a diskette for an image copy.	
Output drive number -	Optional when VOLID provided
Output VOLID _____	Optional when drive provided
INSERT DISKETTE NOW.	
Cmd 9 Cancel ? Help	

You use this screen to tell RECOVER which diskette to copy to.

It is recommended that the diskette you provide for the copy be newly prepared. See the PREPARE chapter in Volume I for more information about how to prepare a diskette. The output diskette must be the same type (1, 2, or 2D) and format (Basic Exchange, H Exchange, or System/23 format) as the diskette with errors.

Output drive number. Enter the number of the diskette drive in which you have inserted the diskette for the copy.

RECOVER (Diskette)

Screens (continued)

Output VOLID. Enter the name of the diskette to be copied to.

You must enter either the drive number or the VOLID. If the input and output diskettes are inserted on different drives, the VOLIDs can be the same.

After you insert the output diskette, press Enter. If the output diskette contains data, screen 08-102 appears. If it does not, RECOVER copies the diskette. While the copy is taking place, an in-progress screen (08-112) is displayed. When the copy is finished and if there are file label errors, RECOVER begins trying to re-create the file labels in error.

When the copy is finished, remove from the diskette drive the diskette with errors (the input diskette). It is no longer used by RECOVER. After you are finished running RECOVER, you can PREPARE this diskette for reuse. See the PREPARE chapter for details. If you cannot successfully prepare the diskette, do not use it again.

Output diskette contains information (screen 08-102)

Recover Labels

08-102

WARNING: One or more files on the output
diskette contains information.

Write over existing information
Y-OK to destroy existing data
N-Do not destroy data
N

This screen appears only if the diskette you identified in screen 08-092 contains data.

Enter Y if it is okay to destroy data that exists on the output diskette you have inserted. Keep in mind that RECOVER copies the contents of the entire diskette, not just the labels. If you enter Y and press Enter, RECOVER begins copying the diskette and displays an in progress screen (screen 08-112).

Enter N if you do not want to destroy the data on the output diskette. After you press Enter, an error occurs and the unsuccessful completion screen (08-272) appears. In this case, no recovery action is taken.

RECOVER (Diskette)

Screens (continued)

File label errors (screen 08-122)

Recover Labels

08-122

Number of read errors in file label area:

6

A list of file labels read with no errors will follow.
Compare with current copy of Display Diskette Labels.
Missing labels represent file label read errors.

This screen appears only if RECOVER cannot read one or more file labels on the diskette being recovered and cannot recover them using duplicate labels.

If the diskette being recovered is a System/23 format diskette and RECOVER cannot read a file label, it looks for a duplicate file label. If it finds one, it recovers the file label. This kind of file label recovery can be performed only for System/23 format files, because they are the only ones that can have duplicate labels.

This screen is for your information only. There are no prompts to answer. It gives the number of file labels (1 in this sample screen) that RECOVER cannot read. It does not include the number of System/23 file labels, if any, that were recovered using duplicate labels.

Existing File labels (screen 08-132)

Recover Labels

08-132

File labels exist for the following files:

HFILE1
HFILE4
HFILE5

Press Enter to continue

Cmd 9 Cancel

This screen appears only if RECOVER cannot read one or more file labels on the diskette being recovered and cannot recover them using duplicate labels. You need the printed output from LABEL to continue.

This screen shows the names of all files with no label errors. If a file label has an error, it is not shown. Compare the filenames on this screen to the LABEL output. If a file is on the LABEL output but not on the screen, it has a label error.

Screen 08-132 is a scroll screen. Up to 18 filenames can be displayed on one screen. To see more files, you must press

RECOVER (Diskette)

Screens (continued)

Enter. After you have checked the filenames shown, press Enter. If the diskette contains more files, more filenames appear. After RECOVER displays the names of the files with no label errors, screen 08-142 appears.

After you have noted which labels have read errors, you will know what filenames to enter on screen 08-142. Sometimes the number of file label errors you find will not match the number shown on screen 08-122. This is because there may be unused labels that RECOVER cannot read.

Recovering a file label (screen 08-142)

Recover Labels

08-142

To recover a missing file label type in:

Filename

If you leave this field blank, no further label recovery action will be taken.

This screen appears only if RECOVER cannot read one or more file labels on the diskette being recovered. You need the LABEL output to continue.

Enter the name of a file that has a read error on the label.

After you press Enter, the next screens request information you can get from the LABEL output. After you respond to screen 08-152, or 08-162 and 08-172 and if there are more file label errors, this screen reappears. You can then enter another filename.

If there are no more file labels you want to recover, leave this screen blank and press Enter. RECOVER then displays a completion screen (08-252).

RECOVER (Diskette)

Screens (continued)

Labels for Basic Exchange or H Exchange (screen 08-152)

Recover Labels		08-152	
Type in required label information from your copy of Display Diskette Labels.			
BLKLNG	_____	EOE	_____
BOE	_____	WRTprt	-
PHYRLN	-	XCHGTP	-
EOD	_____	CRCNUM	_____
Cmd 9 Cancel ? Help			

This screen appears only if RECOVER is trying to re-create a file label on a Basic Exchange or H Exchange diskette.

You need the printed output from LABEL to answer these prompts. Find the filename you entered on screen 08-142 on the LABEL output. The field names on the list are the same as the prompts on this screen.

Enter the information for the prompts exactly as it appears on the LABEL output. You do not need to know what this information means. If a field on the LABEL output is blank, leave the input field blank for that prompt. *Make sure you enter capital (uppercase) letters as they appear.*

Refer to Appendix B for explanations of data on this screen.

RECOVER (Diskette)

Screens (continued)

Label information for System/23 format (screen 08-162)

Recover Labels

08-162

Type in required label information from your copy of Display Diskette Labels.

RCDTYP	—	PRVCNT	_____	FILTYP	—
RCDLNG	_____	KFBCNT	_____	WRTPRT	—
RCDCNT	_____	KEYLNG	—	KEYPOS	_____
INITBK	_____	DUPFLL	_____	DATECR	_____
DATEUP	_____	NUMXNT	—	CRCNUM	_____

Cmd 9 Cancel
? Help

This screen appears only if RECOVER is trying to re-create a file label on a System/23 format diskette.

You need the LABEL output to answer these prompts. Find the filename you entered on screen 08-142 on the LABEL output. The field names on the LABEL output are the same as the prompts on this screen.

Enter the data for the prompts exactly as it appears on the LABEL output. You do not need to know what this information means. If a field on the LABEL output contains leading zeros or all zeros, you must enter them. *Make sure you enter capital (uppercase) letters as they appear.*

Refer to Appendix B for explanations of data on this screen.

RECOVER (Diskette)

Screens (continued)

Label extent information for System/23 format (screen 08-172)

Recover Labels

08-172

Type in required LABEL EXTENT information
from your copy of Display Diskette Labels,
including blank spaces.

•
•
•

This screen appears only if RECOVER is trying to re-create a file label on a System/23 diskette.

You need the printed output from LABEL to answer these prompts. Find the filename you entered on screen 08-142 on the LABEL output. Enter the data from the LABEL output that begins on the left side under the word "LABEL." This is hexadecimal data. You do not need to know what this information means. As you enter the data, leave blanks where they are shown on the LABEL output. *Make sure that you enter capital (uppercase) letters as they appear.*

Refer to Appendix B for explanations of the data on this screen.

Filename of dropped or freed file (screen 08-184)

Recover a Dropped or Freed File

08-184

If you want to recover a file that has been
DROPPed or FREEd type in:

Filename

This screen appears if you selected option 4, recover a dropped or freed file.

Recovery of a dropped or freed file is an attempt to return it to usable status. For a dropped file, RECOVER changes only the file label. It does not rewrite the file. Therefore, a dropped file is recovered on the same diskette.

For a freed file, RECOVER copies the freed file to a new file. The new file must be on a different diskette.

Enter the name of the dropped or freed file that you want to recover.

RECOVER (Diskette)

Screens (continued)

Dropped or freed file (screen 08-194)

Recover a Dropped or Freed File

08-194

Choose one of the following:

1. Recover a DROPPed file
2. Recover a FREEd file

9. Return to main menu

Choice

This screen appears if you entered a filename on screen 08-184.

Enter 1 to recover a file that was dropped. The DIR output for a dropped file shows zeros for the amount of diskette space used.

Enter 2 to try to recover a file that was freed.

Enter 9 to return to the menu.

**Basic Exchange or H Exchange dropped file (screen
08-204)**

Recover a Dropped or Freed File

08-204

Current values for BOE, EOD, and EOE are:

Beginning Of Extent (BOE)	15021
End Of Data (EOD)	15021
End Of Extent (EOE)	30014

Type the value of EOD shown on your current
copy of the Display Diskette Labels listing.

EOD

Cmd 9 Cancel
? Help

This screen appears only if you selected 1, recover a dropped file, on screen 08-194 and the file to be recovered is on a Basic Exchange or H Exchange diskette.

This screen tells you where the dropped file is on the diskette and allows you to change the end-of-data value. The values shown for BOE (15021), EOD (15021), and EOE (30014) are the examples of the values currently in the file label.

The BOE is the diskette address of the beginning of the file.
The EOD is the address of the last data written to the file plus

RECOVER (Diskette)

Screens (continued)

one. If the file really was dropped, this number is equal to the BOE. The EOE is the diskette address where diskette space reserved for the file ends. This address was established when the file was created. The diskette space between the EOD and EOE addresses does not contain any data.

You need the LABEL output to get the value to be entered for EOD.

The number you enter for EOD must be five digits long, and it must be between the values shown for BOE and EOE plus one.

After you press Enter, RECOVER changes the label of the file that was dropped. One of the completion screens (08-264 or 08-274) then appears.

System/23 format dropped file (screen 08-214)

Recover a Dropped or Freed File

08-214

Total record count

Current	0
Previous	78
Maximum	80

Type the value desired for the total record count.

New total record count

Cmd 9 Cancel
? Help

This screen appears only if you selected 1, "Recover a dropped file," on screen 08-194 and the file to be recovered is on a System/23 diskette.

This screen tells you about the number of records in the dropped file and allows you to change the total record count. If the file really was dropped, the value shown for "Current" is 0. The value shown for "Previous" is the record count the last time the record count for the file changed. The value shown for "Maximum" is the largest number of records the file can contain in the amount of diskette space reserved for it.

RECOVER (Diskette)

Screens (continued)

For the prompt, enter the number of records you want the file to have when it is recovered. The number you enter must be between 0 and the value displayed for "Maximum." In most cases, you should use the value displayed for "Previous." More information about this is under "Special uses for dropped file recovery" on page 2-18.

After you press Enter, RECOVER changes the label of the file which had been dropped. One of the completion screens (08-262 or 08-272) then appears.

Physical block numbers (screen 08-224)

Recover a Dropped or Freed File

08-224

WARNING: The following space is being used currently.

Beginning PBN	022E	Ending PBN	022F
Beginning PBN	0230	Ending PBN	0230
Beginning PBN	0231	Ending PBN	0231
Beginning PBN	0232	Ending PBN	0232
Beginning PBN	0233	Ending PBN	0233
Beginning PBN	0234	Ending PBN	0234
Beginning PBN	0235	Ending PBN	0235
Beginning PBN	0236	Ending PBN	0236
Beginning PBN	0237	Ending PBN	0237
Beginning PBN	0238	Ending PBN	0238
Beginning PBN	0239	Ending PBN	0239
Beginning PBN	023A	Ending PBN	023A
Beginning PBN	023B	Ending PBN	023B
Beginning PBN	023C	Ending PBN	023C

Press Enter to continue **Cmd 9 Cancel**

This screen appears only if:

- You selected 2, "Recover a freed file," on screen 08-194, and
- The file being recovered is on a System/23 format diskette, and
- Space that had been reserved for the freed file is now reserved for another file

RECOVER (Diskette)

Screens (continued)

This screen tells you which sectors from the freed file are currently allocated to another file. This screen is a 'scroll-up' screen; after 18 lines are displayed, you have to press Enter to display more lines. There are no prompts on this screen and you do not enter any data.

Refer to "Recovering a freed System/23 file" on page 2-22 for more information.

If you selected 2 on screen 08-194, "Recover a freed file," either screen 08-234 or screen 08-244 will be displayed.

Space reserved (screen 08-234) and Space not reserved (screen 08-244)

Recover a Dropped or Freed File

08-234

Some of the sectors in this file are currently allocated to another file. If you wish to continue, this file will be copied to a new file. It will be your responsibility to validate the data in the new file and to correct it if necessary.

Copy file
Y-Continue recovery
N-Return to menu
Y

Cmd 9 Cancel

Recover a Dropped or Freed File

08-244

None of the sectors in this file are currently allocated to another file. However, this does not guarantee that the data in the file is good. If you wish to continue, this file will be copied to a new file. It will be your responsibility to validate the data in the new file and to correct it if necessary.

Copy file
Y-Continue recovery
N-Return to menu
Y

Cmd 9 Cancel

RECOVER (Diskette)

Screens (continued)

If you selected 2, "Recover a freed file," on screen 08-194, either screen 08-234 or screen 08-244 will be displayed.

These screens warn you that some of the data in the freed file may have been written over by other data.

Enter Y to continue recovery of the freed file. If you enter Y, the file is copied. Enter N to stop recovery and return to the menu.

After the file is copied, it is up to you to check the data to ensure that it is correct.

Number of file labels recovered (screen 08-252)

Recover Labels

08-252

Number of read errors in file label area:

6

Number of file labels recovered:

2

Recover Diskette completed.

This screen appears only if the number of file labels which were recovered does not match the number of file label errors shown on screen 08-122.

This is a successful completion screen, and the output diskette does not contain file label errors. There may be some files missing on the output diskette, but this is not always the case. Some of the sectors with read errors may have contained unused file labels.

RECOVER (Diskette)

Screens (continued)

Displaying/printing output and specifying input file (screen 08-283)

Recover a File	08-283
Information and messages to:	
1-Screen only	
2-Screen and printer	
3-Printer only	
2	
Printer number	Required when printer used
10-First printer	
11-Second printer	
10	
Input drive number	Optional when VOLID provided
-	
Input VOLID	Optional when drive provided

Input filename	Required

	Cmd 9 Cancel
	? Help

This screen allows you to specify how you want your output messages, information etc. (displayed only, displayed and printed, printed only). It also allows you to identify the file to be recovered.

Information and messages to. Select 1 if you want in-progress and completion screens (08-113, 08-263, and 08-273) and messages to be displayed on the screen. Select 2 to both display this information and print it on the printer. Select 3 to only print this information. If you select 2 or 3, your System/23 system must have a printer attached; if it does not an error occurs.

Printer number. If you entered 2 or 3 above, select the printer to be used.

Input drive number. Enter the number of the diskette drive which contains the diskette with the file to be recovered. Valid entries are 1-4.

Input VOLID. Enter the VOLID of the diskette that contains the file to be recovered.

You must enter either the input drive number or input VOLID.

Input filename. Enter the name of the file to be recovered.

RECOVER (Diskette)

Screens (continued)

Output file (screen 08-293 and 08-294)

Recover a File

08-293

Output drive number

-

Optional when
VOLID provided

Output VOLID

Optional when
drive provided

Output filename

Required

This screen appears if:

- You selected 2, "Recover a freed file," on screen 08-192 and entered Y to continue recovery on screen 08-232 or 08-242, or
- You selected 3, "Recover a file," on the menu

For recovery of a freed file, RECOVER copies the freed file to a different diskette. You use this screen to provide information about the output file.

For recovery of a file (option 3 on the menu), RECOVER reads each sector of the file and tells you which sectors have errors. It then copies the file and puts blanks in the sectors which have errors. The output file can be on the same or a different diskette.

Output drive number. Enter the number of the drive in which you have inserted the diskette for the output file.

Output VOLID. Enter the VOLID of the diskette on which the output file is to be written.

You must enter either the drive number or the VOLID.

Output filename. Enter the name you want to give to the output file that is being recovered to.

For recovery of a freed file, the freed file and the output file must be on different diskettes. Therefore you can enter the same name for the output file as you entered for the freed file to be recovered.

For file recovery, if the file being recovered and the output file are on different diskettes, you can enter the name of the file being recovered. If the output file is to be on the same diskette, you must enter a different filename.

RECOVER (Diskette)

Screens (continued)

Relative record number(s) (screen 08-303)

Recover a File

08-303

A data read error has been detected between and including:

First record number	2
Last record number	3

Information in internal representation and graphic form for sectors on either side of bad sector(s) will be given to help programmer reconstruct lost data. Error sector(s) data will be provided if it exists.

This screen appears if RECOVER encounters a read error in the file being recovered.

The first and last record numbers are relative record numbers of records in the input file. For display files, the first and last record numbers actually are the sector numbers relative to the beginning of the file. These numbers tell you which records in the file might have unreadable or erroneous data. Sometimes the first and last record numbers are the same. This means that the unreadable or erroneous data is on just one record.

The record numbers shown are the records in the input file that you are going to have to try to reconstruct.

After you press Enter, screen 08-313 or 08-323 appears; three versions of these screens are displayed. If the file being recovered has another sector which RECOVER cannot read, screen 08-303 reappears, followed again by screen 08-313 or 08-323.

When RECOVER copies the file, the sectors having errors are written to the output file as blanks. After the output file is written, RECOVER displays a completion screen (08-263 or 08-273).

RECOVER (Diskette)

Screens (continued)

Previous, error, and following sectors (screen 08-312 and 08-313)

These screens appear if RECOVER encounters a read error in the input file and some data can be read. They provide information to help you find exactly what data cannot be read or what data is erroneous so that you can try to reconstruct it. There are no prompts on these screens, and you do not enter any data.

This is an example of a previous sector screen.

```
Recover a File08-313
49105
Internal representation      Previous sector      Graphic
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
0000  5C 5C E3 C8 C9 E2 40 C9 E2 40 E3 C8 C5 40 D4 C1  **THIS IS THE MA
0010  C8 D5 40 C3 D6 D7 E8 40 C6 C9 D3 C5 5C 5C 40 40  IN COPY FILE**
0020  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0030  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0040  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0050  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0060  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0070  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0080  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0090  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00A0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00B0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00C0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00D0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00E0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00F0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Press Enter to continueCmd 9 Cancel
```

This is an example of an error sector screen.

```
Recover a File                                08-313
WARNING: Data may be incorrect.                Error sector 49106
Internal representation                         Graphic
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

0000      C2 C2 C2 C2 C1 C1 C1 C1 C3 C3 C3 C3 C1 C1 C1 C1      BBBBAAAACCCCAAAA
0010      C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 40 40      AAAAAAAAAAAAAA
0020      40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0030      40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0040      40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0050      40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0060      40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0070      40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0080      00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0090      00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00A0      00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00B0      00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00C0      00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00D0      00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00E0      00 00 00 00 02 08 02 22 08 08 83 88 A8 A2 EF D5
00F0      55 7E AE F4 5B EB FD 57 EA BD D7 3F AB E6 FF B3

                                     I chys0N
                                     i=>4#00I*~P 2W R

Press Enter to continue                                Cmd 9 Cancel
```

RECOVER (Diskette)

Screens (continued)

This is an example of a following sector screen.

```
Recover a File                                08-313
                                           .Following sector 49108
                                           Graphic
Internal representation
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

0000  C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1  AAAAAAAAAAAAAAAAAA
0010  C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 40 40  AAAAAAAAAAAAAAAAAA
0020  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0030  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0040  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0050  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0060  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0070  40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
0080  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0090  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00A0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00B0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00C0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00D0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00E0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00F0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Press Enter to continue                                Cmd 9 Cancel
```

Screen 08-312 is displayed if a read error occurs on a data sector during the image copy. Previous and following sectors are not displayed.

There are three versions of screen 08-313; previous sector, error sector, and following sector. The error sector screen shows the contents of the sector that contains the records identified in screen 08-303. If there are errors on two or more consecutive sectors, the error sector screen appears more than once. The previous and following sector screens show the data in the sectors before and after the error sectors.

If the file is on a Basic Exchange or H Exchange diskette, an entire sector is shown on one screen. For a System/23 format diskette, it takes two screens to show the contents of one sector. Therefore, if your input file is on a System/23 diskette, the previous, error, and following sector screens will each be displayed twice.

The number of the sector being displayed is shown as five digits on the top right of the screen. The first two digits are the cylinder number; the third digit is the surface number (1 or 1); the last two digits are the sector number. The contents of the sector are shown in two ways: hexadecimal and EBCDIC. The hexadecimal data has the heading "Internal representation" and is on the left side of the screen. The EBCDIC data has the heading "Graphic" and is on the right side of the screen.

Below the headings, each line shows the contents of 16 bytes in the sector (on the left in hexadecimal and on the right in EBCDIC.) The first line (row 0000) shows the first 16 bytes of data in the sector. The second line (row 0010) shows the data in bytes 17-32 of the sector. You always read this screen from left to right and from top to bottom.

A blank under the EBCDIC heading sometimes means that the character cannot be displayed and/or printed. An example is with an accent mark, which can be displayed only by using the Alt key. Also, the way, a given EBCDIC character is shown on the screen may not match how it is printed

RECOVER (Diskette)

Screens (continued)

If you are printing these screens (option 2 or 3 for information and messages), the printed output is saving the information you need to reconstruct the records in the error sector. If you are only displaying these screens and your system has a printer, use Cmd CopyD to print them. If your system does not have a printer, make notes about which records have errors and the data they contain so you will know what records to try to reconstruct.

Sector cannot be read (screen 08-322 and 08-323)

Recover a File

08-323

```
No data available for error sector  
XXXXX
```

This screen appears instead of screen 08-313 if RECOVER cannot read any data in a sector.

There are no prompts on this screen, and you do not enter any data.

This screen can display three messages.

- "First sector in file is faulty." This appears instead of a "previous sector" screen if the first sector in the file has a read error.
- "No data available for error sector XXXXX" where XXXXX is the number of the error sector. The error sector on the sample screen is 50004.
- "Last sector in file is faulty." This appears instead of a "following sector" screen if the last sector in the file has a read error.

RECOVER (Diskette)

Screens (continued)

Displaying/printing information and messages (screen
08-332 and 08-334)

Recover Labels

08-332

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only
- 2

Printer number
10-First printer
11-Second printer
10

Required when
printer used

Cmd 9 Cancel
? Help

This screen allows you to specify how you want output messages handled while you are running label recovery or dropped or freed file recovery.

Information and messages. Select 1 if you want in progress and completion screens (08-112, 08-262 and 08-272) and messages to be displayed on the screen. Select 2 to both display this information and print it on the printer. Select 3 to only print this information. If you select 2 or 3, your System/23 system must have a printer attached; if it does not, an error occurs.

Printer number. If you entered 2 or 3 above, select the printer to be used.

Chapter 3. SORT and PRESORT

Introduction

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), SORT and PRESORT are on diskette VOL001.

Note: If you have the 5247 Disk Unit, SORT and PRESORT have probably been copied to your disk.

SORT and PRESORT are separate, but related, Customer Support Functions. They are covered in the same chapter because PRESORT's sole purpose is to help you prepare the information needed by SORT.

Note: If you have the 5247 Disk Unit, your SORT and PRESORT Customer Support Functions were not already on your disk; your other Customer Support Functions were. You can, however, use your COPY Customer Support Function to copy SORT and PRESORT from your Customer Support Functions diskette to your disk. Copy them to VOL002 or the volume on your disk that contains your other Customer Support Functions.

Overview of SORT

Using SORT, you can take an input file of records and produce a sorted output file of these records. SORT allows you to rearrange records in a variety of ways to suit your needs.

Before you run any sort, you should understand something about what SORT needs to do its processing:

1. *An input file that contains the records you want to sort.* This file must be a record I/O (type 04) file. You will need to know the layout of each of the records in the file—that is, what information is in what position in the record and how many characters long the information is.

For example, suppose your input file contains records that have just two pieces of information in each record:

SORT and PRESORT

Introduction (continued)

	Customer name field	Customer number field
Record	(Positions 1-24)	(Position 25-30)
Record1	Williams	195872
Record2	Greenwood	426789
Record3	Harper	241796
Record4	Abbot	542789
.	.	.
.	.	.
.	.	.
RecordX	XXXX	XXXXXX

If you wanted to sort the records by customer name, you would need to know the position of the customer name and how much space it takes up in the record. The area in the record each of these items occupies is called a field. This brings up the next requirement for a sort.

2. *A field in the record on which to sort.* Suppose the records in your file contain the two fields shown in the previous example. You could do a sort on the customer name field and get the records in alphabetic order by customer name.

You could also do a sort by customer number and get the records in numeric order by customer number. You need to specify this information so that SORT will know how you want your records sorted in the output file. More detail about sort fields is in the SORT section of this chapter.

3. *A name for the output file to be created by SORT.* This output file will contain the records from your input file, sorted in the order you specified.

The preceding information is all you need to do a simple sort. SORT, of course, can do more complex sorts. More details about these capabilities are in the SORT section of this

chapter. You will find that SORT offers a great deal of flexibility in defining the sorts you will need in your day-to-day computer activities.

The next section describes how PRESORT is used in conjunction with SORT.

Overview of PRESORT

Now that you know some of the information that SORT needs, it is easier to understand the purpose of PRESORT. PRESORT is a tool designed to help you prepare the information SORT needs to do its processing.

Think of PRESORT as a special editor that can take information you enter on the screen and put it in a form that SORT can use. PRESORT puts the information in the form of sort statements that tell SORT what to do. Sort statements are described in detail in the SORT section.

After you LINK PRESORT, you respond to prompts to supply the information PRESORT needs. Screens will request information about the files used, fields, and sort statements. You will see this in the example later in this chapter.

There is a certain minimum information that you must specify (as described under "Overview of SORT" on page 3-1). Other information (for more complex sorts) is optional. *PRESORT is designed so that you can just skip past the screens that do not apply to your sort by pressing Enter.*

After you finish making your entries, PRESORT puts this information in the format and order that SORT needs. This information, which is now in the form of sort statements, is then put in a *control file*.

SORT and PRESORT

Introduction (continued)

The control file is the key to using SORT. After the control file is created, you can use it any number of times to do the same sort. PRESORT also allows you to make changes, to an existing control file. This and other details of PRESORT are covered in the PRESORT section.

SORT, PRESORT, and the Control File

Once you have used PRESORT to create the control file, SORT is very simple to use. All you have to do is enter the BASIC command SORT and the name of the control file. For example, suppose you have prepared a control file called CFILE1. When you are ready to start your SORT, you would enter:

```
SORT CFILE1
```

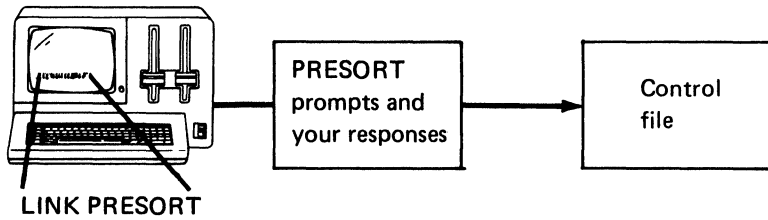
When the sort is complete, the status line indicates READY INPUT status. You now have an output file with records sorted in the order you specified in the control file.

Next in this chapter are examples of the whole process:

- Using PRESORT to build the control file
- Using SORT to create a sorted output file
- Using a simple BASIC program to print the output of the file.

Figure 3 gives an overview of using SORT and PRESORT.

Part 1. Using PRESORT



Part 2. Using SORT

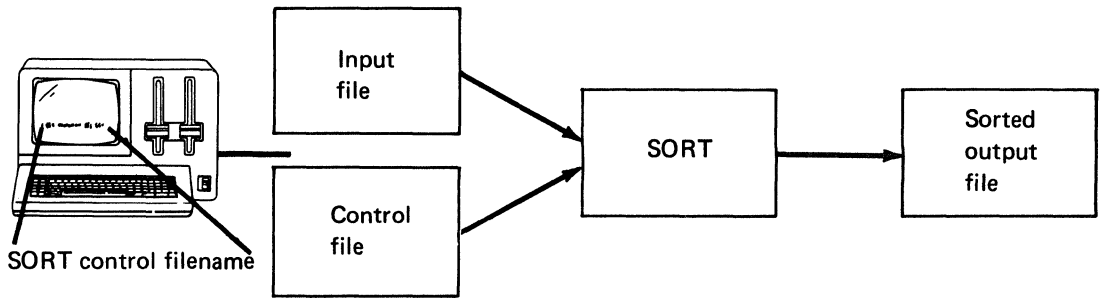


Figure 3. Using PRESORT and SORT

SORT and PRESORT

Examples of using PRESORT and SORT

To more quickly familiarize you with the operation of PRESORT and SORT, two examples are given here. The first example shows how to create a control file for a simple sort. The second example is slightly more complex. The same input file will be used for both examples, but the control files and output files will be different.

Note: Both examples will show how to use PRESORT, then use SORT, and then use a simple BASIC program to print the output from the sort.

Example 1. A simple sort.

Suppose you have a file named INPUT.EXAMPLE that contains the following records.

JONES	130 ELM ST	BOCA RATON	FL	33432
HUGHES	112 MORGAN	PALM BEACH	f1	33555
RIGHT	4645 WALNUT	BOCA RATON	FLA	33432
ALLING	491 MAIN	GRAYSLAKE	ILL	89577
NELSON	650 WALNUT	BOCA RATON	f1	33432
SMITH	655 PALM	MIAMI	Fla	33555
GORDON	232 CHESTNUT	boca raton	FLA	33433
OWENS	411 AVON	DELRAY BEACH	FL	33432
ANTICO	922 SOUTH ST	BROOKLYN	NY	13355

What you want to do is sort the records in this file in *descending* order by city. To create the control file, you only need to know the following:

- The input file name (INPUT.EXAMPLE).
- The field on which the sort is being done—in this case, it is the city field.
- The output filename, which we will call OUTPUT.EX1.
- The control filename, which we will call CONTROL.EX1.

The following information about the layout of the INPUT.EXAMPLE file should help you respond to PRESORT prompts.

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), PRESORT is on diskette VOL001.

Data description	Starting position	Field length	Data type
Customer's name	1	20	Character
Street Address	21	15	Character
City Name	36	15	Character
State Abbreviation	51	6	Character
Zip Code	57	5	Character

Before you start, you will need the following:

- The PRESORT Customer Support Function
- The disk volume or diskette containing INPUT.EXAMPLE. This disk volume or diskette will also contain the output file of sorted record.

In this example, the file is on a diskette.

Running PRESORT. To start PRESORT:

1. Insert the Customer Support Functions diskette in drive 2.
2. Enter: LINK PRESORT

Note: If you have the 5247 Disk Unit, PRESORT is probably on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

After you press Enter, the PRESORT menu is displayed.
Select 2 and press Enter.

Prepare Sort Menu

06-010

Choose one of the following:

1. Description of Prepare Sort
2. Create control file
3. Add sort group
4. Change sort group
5. Insert sort group
6. Delete sort group
7. Print control file

9. End Prepare Sort

Choice

2

Remove VOL001 and insert the diskette containing
INPUT.EXAMPLE in drive 1.

The next screen requests the name of the control file. Name it CONTROL.EX1 and put it on the same diskette as INPUT.EXAMPLE (in drive 1).

Create Control File

06-022

Control filename

CONTROL.EX1

Required

VOLID

Required for drive 5.
Optional when drive number
1-4 provided and no
control file exists.
Not required if control
file exists on diskette.

Drive number

1

Optional when VOLID
provided and no control
file exists. Not required
if control file exists.

Cmd 9 Cancel
? Help

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

The next screen asks if we want to see summary information (about number of records read etc.). We are doing a simple sort and do not need to see the summary. Enter N.

Create Control File

06-052

The following refers to the Sort Summary Statement

Display summary information
Y-Display record counts
N-Do not display summary
N

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

The next screen requests information about your input file, output file, and work files.

The input file name is INPUT.EXAMPLE and it will be on drive 1.

The output file will also be on drive 1 and we will name it OUTPUT.EX1.

The work files will also be on drive 1. (SORT may need some work files. Just specify the same thing as you did for the output file—drive 1.) This will be a record out sort, and we will use the native collating sequence, so leave the last two fields as they are (R and N). (Types of sorts—record out and address out—are described in the SORT section of this chapter. More information about collating sequences is in the SORT section of this chapter, in the COLSEQ chapter, and in Appendix A.)

Create Control File

06-062

The following refers to the FILE statement:

Input filename	Required
<u>INPUT.EXAMPLE</u>	
Input VOLID	Required when input drive number is 5
<u> </u>	Optional
Input drive number	
1	
Output filename	Required
<u>OUTPUT.EX1</u>	
Output VOLID	Required when output drive number is 5
<u> </u>	Optional when output VOLID provided.
Output drive number	
1	
Work file VOLID	Required when work file drive number is 5
<u> </u>	Optional when work file VOLID provided.
Work file drive number	
1	

Address out (A) or Record out (R) sort

B

Native (N) or Alternate (A) collating sequence

N

Cmd 9 Cancel

? Help

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

The next two screens request information that is optional. For a simple sort, you will not need to specify any of this information. Just press Enter for the next two screens:

Create Control File

06-082

ALTS Statement is optional. To skip just press Enter.

Method for altering sequence	Required
RO-Reorder sequence	
EQ-Equate values	
—	

Value	Required
—	

Characters	Required
_____	Enclose in
	quotes

Gmd 9 Cancel
? Help

After you press Enter, the following screen is displayed:

Create Control File	06-072
RECORD SELECTION statement is optional. To skip just press Enter.	
Omit (O) or Include (I) records	Required
—	
Field starting position	Required
—	
Field length	Required
—	
Data type (B,C,L,N,PD,ZD)	More information in help
C	
Lower limit	Optional
—	
Upper limit	Optional
—	
	Cmd 9 Cancel ? Help

After you press Enter, the next screen requests information about the sort field. The field we want to do the sort on is the city. The city field begins in position 36 of the record and is 15 characters long. It is character data. The sort will be done in descending sequence.

After you press Enter, the screen is redisplayed. Notice that the sort field number is now 2. You only have one sort field, so just press Enter. (Up to 10 sort fields are allowed, so this screen could be redisplayed up to 10 times.)

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

Create Control File

06-092

The Sort Key is identified by the MASK statement.
Only one sort field is required. To end, press Enter.

Sort field number - 1

Field starting position Required
36

Field length Required
15

Data type (B,C,L,N,PD,ZD) Optional
C

Sort order Optional
A - Ascending
D - Descending
D

Cmd 9 Cancel
? Help

After you press Enter, PRESORT does its processing. It then displays a completion screen:

Create Control File

06-102

Prepare Sort successfully completed.

After you press Enter, the option menu is displayed. Enter 9 to end PRESORT and return to READY INPUT status.

You now have a control file (CONTROL.EX1) on the diskette in drive 1, along with your input file (INPUT.EXAMPLE).

Assume that the SORT Customer Support Function is on the diskette in drive 1. (It could be on any drive.) To start the sort, enter:

```
SORT CONTROL.EX1
```

When the sort is complete, READY INPUT appears on the status line. Your output file of sorted records, OUTPUT.EX1, is now created. To print the sorted records, you will need a simple BASIC program:

```
00010 DIM NAME$*20,STREET$*15,CITY$*15,STATE$*6,ZIP$*5
00020 OPEN #3:"name=output.ex1//1",INTERNAL,INPUT
00140 READ #3,USING 150;NAME$,STREET$,CITY$,STATE$,ZIP$ EOF 300
00150 FORM C 20,C 15,C 15,C 6,C 5
00160 PRINT #255;NAME$;STREET$;CITY$;STATE$;ZIP$
00170 GOTO 140
00300 CLOSE #3:
00310 END
```

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

After you run the program, this is what the printed output will look like:

HUGHES	112 MORGAN	PALM BEACH	f1	33555
SMITH	655 PALM	MIAMI	Fla	33555
ALLING	491 MAIN	GRAYSLAKE	ILL	89577
OWENS	411 AVON	DELRAY BEACH	FL	33432
ANTICO	922 SOUTH ST	BROOKLYN	NY	13355
JONES	130 ELM ST	BOCA RATON	FL	33432
RIGHT	4645 WALNUT	BOCA RATON	FLA	33432
NELSON	650 WALNUT	BOCA RATON	f1	33432
GORDON	232 CHESTNUT	boca raton	FLA	33433

Notice that the output is rearranged in the order you specified—descending order by city.

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), PRESORT is on diskette VOL001.

Note: If you have the 5247 Disk Unit, PRESORT is probably on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

Example 2. A more complex sort.

This example will use the same input file as was used in Example 1 (INPUT.EXAMPLE).

What we want to do is use PRESORT to create a control file that will tell SORT to:

- Select all customers that live in the state of Florida.
- Put the records in order by:
 - Zip code first
 - City name second
 - Street name third.

The control file will be named CONTROL.EX2. The output file for the sorted records will be called OUTPUT.EX2

You will need the same diskettes as used in Example 1.

Running PRESORT. To start PRESORT:

1. Insert the Customer Support Functions diskette that contains PRESORT in diskette drive 1.
2. Enter: LINK PRESORT

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

After you press Enter the PRESORT menu is displayed. Select 2 and press Enter.

Prepare Sort Menu

06-010

Choose one of the following:

1. Description of Prepare Sort
2. Create control file
3. Add sort group
4. Change sort group
5. Insert sort group
6. Delete sort group
7. Print control file

9. End Prepare Sort

Choice

2

Remove VOL001 and insert the diskette containing INPUT.EXAMPLE in drive 1.

The next screen requests the name of the control file. Name it CONTROL.EX2 and put it on the same diskette as INPUT.EXAMPLE (in drive 1).

Create Control File

06-022

Control filename
CONTROL.EX2

Required

VOLID

Required for drive 5.
Optional when drive number
1-4 provided and no
control file exists.
Not required if control
file exists on diskette.

Drive number
1

Optional when VOLID
provided and no control
file exists. Not required
if control file exists.

The next screen asks if we want to see summary information (about number of records read etc.). Enter Y to display the summary.

Create Control File

06-052

The following refers to the Sort Summary Statement

Display summary information
Y-Display record counts
N-Do not display summary
Y

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

The next screen lets you enter comments about the sort. Enter the comments as shown. These comments will later be displayed while SORT is running.

Create Control File

06-042

Comment Statement is optional. To skip just press Enter.

Select all customers from the state of
Florida.

Sort the file by:

1. Zip code
2. City name
3. Street name

Cmd 9 Cancel
? Help

The next screen requests information about the input file, output file and work files.

The input filename is INPUT.EXAMPLE and it is on drive 1. The output file will also be on drive 1, and we will name it OUTPUT.EX2 The work files will also be on drive 1.

This will be an address out sort (A) and we will use the native collating sequence (N).

Create Control File

06-062

The following refers to the FILE statement:

Input filename	Required
<u>INPUT.EXAMPLE</u>	
Input VOLID	Required when input drive number is 5
<u> </u>	
Input drive number	Optional
<u>1</u>	
Output filename	Required
<u>OUTPUT.EX2</u>	
Output VOLID	Required when output drive number is 5
<u> </u>	
Output drive number	Optional when output VOLID provided.
<u>1</u>	
Work file VOLID	Required when work file drive number is 5
<u> </u>	
Work file drive number	Optional when work file VOLID provided.
<u>1</u>	

Address out (A) or Record out (R) sort

A
Native (N) or Alternate (A) collating sequence
N

Cmd 9 Cancel
? Help

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

The next screens let you define the collating sequence to be used. We want to change the EBCDIC collating sequence for this sort so that A through Z will have the same value in the sort as a through z. To understand the entries on the next three screens, refer to Appendix A; look at the values in the EBCDIC collating sequence for characters A–Z.

A–I have the values 193–201
J–R have the values 209–217
S–Z have the values 226–233

For "Method..." enter RO to reorder the sequence. For "Value," enter 193. For "Characters," enter characters a through i. This will set the values of the characters a through i to the same values as A through I.

Create Control File

06-082

ALTS Statement is optional. To skip just press Enter.

Method for altering sequence	Required
RO-Reorder sequence	
EQ-Equate values	
<u>RO</u>	
Value	Required
<u>193</u>	
Characters	Required
<u>"abcdefghi"</u>	Enclose in quotes

Cmd 9 Cancel
? Help

The same screen will be displayed again to let you continue your changes. This time enter 209 for "Value" and j through r for "Characters."

Create Control File

06-082

ALTS Statement is optional. To skip just press Enter.

Method for altering sequence	Required
RO-Reorder sequence	
EQ-Equate values	
<u>RQ</u>	
Value	Required
<u>209</u>	
Characters	Required
<u>"ijklmnopq"</u>	Enclose in quotes

Cmd 9 Cancel
? Help

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

The same screen will be displayed again to let you continue your changes. This time enter 226 for "Value" and s-z for "Character."

Create Control File

06-082

ALTS Statement is optional. To skip just press Enter.

Method for altering sequence	Required
RO-Reorder sequence	
EQ-Equate values	
<u>RO</u>	
Value	Required
<u>226</u>	
Characters	Required
<u>"stuvwxyz"</u>	Enclose in quotes

Cmd 9 Cancel
? Help

The next time this screen is displayed, just press Enter to continue. The collating sequence alterations are now complete.

The next screen lets you specify information about selecting records from the input file. We want to include (I) all records for the state of Florida. (The state field starts in column 51 and it is 6 characters long.) It is character (C) data. The lower limit is specified as FA and the upper limit FL to ensure that all abbreviations for Florida will be included in the sort.

Note: Lowercase spellings will be included because we have altered the collating sequence to give upper and lower case characters the same value.

Create Control File

06-072

RECORD SELECTION statement is optional. To skip just press Enter.

Omit (O) or Include (I) records	Required	
<u>I</u>		
Field starting position	Required	
<u>51</u>		
Field length	Required	
<u>6</u>		
Data type (B,C,L,N,PD,ZD)	More information in help	
<u>C</u>		
Lower limit	Optional	
<u>"FA"</u>		
Upper limit	Optional	Cmd 9 Cancel
<u>"FL"</u>		? Help

This screen will be redisplayed to allow you to continue making entries to select records from the input file. The next time this screen is displayed, press Enter to continue.

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

The next screen asks for information about the fields in each record that SORT must check to do the sort. In this example we are interested in three fields:

The first sort field will be the zip code. It starts in position 51, is five characters long, and is character data. The sort will be in ascending order.

Create Control File

06-092

The Sort Key is identified by the MASK statement.
Only one sort field is required. To end, press Enter.

Sort field number - 1

Field starting position Required
 57

Field length Required
 5

Data type (B,C,L,N,PD,ZD) Optional
 C

Sort order Optional
 A - Ascending
 D - Descending
 A

Cmd 9 Cancel
? Help

After you make the entries and press Enter, screen 06-092 will be displayed again. Note that the "Sort Field Number" now is 2.

The second sort field is the city. It starts in position 36, is 15 characters long, and is character data. This sort will also be in ascending order.

Create Control File

06-092

The Sort Key is identified by the MASK statement.
Only one sort field is required. To end, press Enter.

Sort field number - 2

Field starting position Required
36

Field length Required
15

Data type (B,C,L,N,PD,ZD) Optional
C

Sort order Optional
A - Ascending
D - Descending
A

Cmd 9 Cancel
? Help

After you make the entries and press Enter, screen 06-092 will be displayed again. Note that the "Sort Field Number" is 3.

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

The third sort field is the street name. It starts in position 21, is 15 characters long, and is character data. This sort will also be in ascending order.

Create Control File

06-092

The Sort Key is identified by the MASK statement.
Only one sort field is required. To end, press Enter.

Sort field number - 3

Field starting position Required
21

Field length Required
15

Data type (B,C,L,N,PD,ZD) Optional
C

Sort order Optional
A - Ascending
D - Descending
A

Cmd 9 Cancel
? Help

When screen 06-092 is displayed again, you simply press Enter to continue. You have completed the information about the sort fields.

The next screen will be the completion screen:

Create Control File

06-102

Prepare Sort successfully completed.

After you press Enter, the option menu is redisplayed. Enter 9 to end PRESORT and return to READY INPUT Status.

You now have a control file CONTROL.EX2 on the diskette in drive 1, along with your input file (INPUT.EXAMPLE).

Assume that the SORT Customer Support Function is on the diskette in drive 1. To start the sort, enter:

SORT CONTROL.EX2

The following is displayed while SORT is running:

SELECT ALL CUSTOMERS FROM THE STATE OF
FLORIDA.

SORT THE FILE BY:

1. ZIP CODE
2. CITY NAME
3. STREET NAME

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

When the sort is complete, the following summary information is displayed on the screen.

```
SORT COMPLETE
9 RECORDS WERE READ
7 RECORDS WERE SELECTED
7 RECORDS WERE OUTPUT
PRESS ENTER TO CONTINUE
```

When the Summary information is displayed, press Enter to continue. READY INPUT will then appear on the Status line.

Your output file of sorted records, OUTPUT.EX2 is now created. To print the sorted records, you can use the BASIC program that follows. When you load and run the program, it lets you enter the input file name and output file name.

```
00010 REM PRINT INPUT FILE FROM ADDRESS OUT SORT FILE
00020 REM INPUT FILE IS CHARACTER DATA WITH RECORD LENGTH < 256 BYTES
00030 DIM INPUT*255
00040 PRINT "ENTER SORT OUTPUT FILE NAME"
00050 LINPUT ADNAME$
00060 PRINT "ENTER SORT INPUT FILE NAME"
00070 LINPUT INNAME$
00080 PRINT *255;INNAME*;" Ordered according to the file "&ADNAME*
00090 PRINT *255;
00100 OPEN #1;"NAME="&ADNAME*,INTERNAL,INPUT IOERR 190
00110 OPEN #2;"NAME="&INNAME*,INTERNAL,INPUT ,RELATIVE IOERR 190
00120 LET LENGTH=RLN(2)
00130 READ #1,USING 140;RRN EOF 220
00140 FORM PD 3
00150 READ #2,USING 160,REC=RRN;INPUT* IOERR 210
00160 FORM C LENGTH
00170 PRINT *255;INPUT*
00180 GOTO 130
00190 PRINT *255;"IO ERROR NUMBER";ERR;" ON OPEN"
00200 GOTO 220
00210 PRINT "I/O error number";ERR;" during read of "&INNAME*
00220 CLOSE #1; IOERR 230
00230 CLOSE #2; IOERR 240
00240 END
```

The BASIC program is a very important part of the sort process. It allows you to print headers, eliminate unwanted fields, rearrange record fields, and summarize information. You use the program to format and present the program output.

SORT and PRESORT

Examples of using PRESORT and SORT (continued)

After you run the program, this is what the printed output will look like.

JONES	130 ELM ST	BOCA RATON	FL	33432
RIGHT	4645 WALNUT	BOCA RATON	FLA	33432
NELSON	650 WALNUT	BOCA RATON	f1	33432
OWENS	411 AVON	DELRAY BEACH	FL	33432
GORDON	232 CHESTNUT	boca raton	FLA	33433
SMITH	655 PALM	MIAMI	Fla	33555
HUGHES	112 MORGAN	PALM BEACH	f1	33555

Your records are sorted as you specified:

- Only records for Florida are included
- The records are ordered first by zip code, then by city, and then by street.

Example 3. Using Record Statement screen 06-072

This example helps you understand more about screen 06-072, the Record Statement screen.

Suppose each employee record in a company is set up in the following way:

Starting position	Field length	Data description
1	20	Employee name
21	5	Employee number
26	7	Sales for current week
33	7	Average sales per employee for current week

Suppose the company president wants to give a bonus to all employees who exceed the average sales. In the output file, you want to select those employees whose "Sales for current week" exceeds the "Average sales per employee for current week." You could use the Record Statement screen to select the employees.

Specify the fields as indicated on the next screen.

-
- C indicates that the "Sales for current week" field contains characters.
 - 33 indicates the "Average sales per employee for current week" field.

If this field indicates less than the "Sales for current week," the record is included.

Look at the following records:

Starting position	Data description		
1	SMITH	JONES	FRANK
21	52716	92612	92111
26	5000	3000	4010
33	4000	4000	4000

In this example, the "Average sales per employee for current week" is 4000. Since this value is less than the "Sales for current week" for SMITH (5000) and for FRANK (4010), the records for SMITH and FRANK are included. However, the record for JONES is omitted.

Summary

In the first section of this chapter, you have been given overview information about PRESORT and SORT. The next two sections provide reference information about PRESORT and SORT.

The PRESORT section describes PRESORT in terms of screens and how to supply the requested information. All screens are shown, and they are in numeric order.

SORT and PRESORT

PRESORT

PRESORT, like the other Customer Support Functions, is started by using the **LINK** command. A menu is displayed offering a variety of options. After you select an option, you respond to prompts. These prompts request information such as names of files and how records are to be rearranged.

PRESORT checks your responses to make sure they are complete and valid. Then it puts your responses in the correct order and format and puts them on a diskette or the disk in a control file. When you are ready to do the sort, the control file tells **SORT** what to do.

Remember, **PRESORT** is used to create the control file. It does not do the sorting.

PRESORT screens

The emphasis in this section is on PRESORT screens. The screens give all the information you need to use PRESORT. Certain screens request information about files PRESORT uses. Other screens are related to sort statements. For screens that are related to sort statements, you will only be given explanations on how to make your responses. Descriptions of the SORT statements and their syntax are in the SORT section of this chapter.

Screen sequence, screen numbers, and screen titles.

This section explains the PRESORT screens. The screens are shown in ascending sequence by screen number. This is not always the order in which they appear while you are running PRESORT. The order of the screens depends upon the option you select on the menu and your answers to certain prompts.

The title and number of many screens also depend upon the option you select on the menu. For screens on which this information can vary, the heading above the screen shows more than one screen number.

The screens shown in this section do not show the status line. In most cases, Cmd 9 and Help are also not shown.

SORT and PRESORT

PRESORT (continued)

PRESORT Menu (screen 06-010)

Prepare Sort Menu

06-010

Choose one of the following:

1. Description of Prepare Sort
2. Create control file
3. Add sort group
4. Change sort group
5. Insert sort group
6. Delete sort group
7. Print control file

9. End Prepare Sort

Choice

-

Select **1** to see two screens (06-111 and 06-121), that describe Prepare Sort. After screen 06-121 is displayed, the program returns to this menu.

Select **2** to create a new control file. When you create a control file, you create one sort group.

Select **3** to add a sort group to an existing control file. The sort group is added to the file as the last group.

To create a control file with more than one sort group, use option 2 first. After the successful completion screen (06-102) is displayed, return to the menu and select option 3.

Select 4 to change the statements in an existing sort group. You must know the number of the sort group to be changed. You can get it by printing the control file (option 7).

Select 5 to create a new sort group and insert it into an existing control file. You must know the number you want to give to this sort group in the file.

Select 6 to delete a sort group from an existing control file. You must know the number of the sort group to be deleted. You can get it by printing the control file (option 7).

Select 7 to print the contents of an existing control file. The sort groups are printed in ascending sequence by sort group number. The sort statements for each group are printed in the order in which they are written on the files.

Select 9 to end PRESORT. The system then returns to READY INPUT status.

SORT and PRESORT

PRESORT (continued)

Control File (screens 06-022—06-027)

Create Control File		06-022
Control filename	Required	

VOLID	Required for drive 5. Optional when drive number 1-4 provided and no control file exists. Not required if control file exists on diskette.	

Drive number	Optional when VOLID provided and no control file exists. Not required if control file exists.	
-		
		Cmd 9 Cancel ? Help

A new or updated control file is the output of the PRESORT. When PRESORT is completed, it writes the control file to diskette as a record I/O file with a record length of 128-bytes.

Control filename. To create a new control file, enter the name of a file that does not already exist. To add, change, or insert a sort group, enter the name of the existing control file in which you want to save the sort group. To delete a sort group, enter the name of the control file which contains the sort group to be deleted. To print a control file, enter the name of an existing control file. The filename can be up to 17 characters in length.

VOLID. Enter the VOLID of the disk volume or diskette for the above-named control file.

You must enter the VOLID if your drive number is 5 (disk).

Drive number. Enter the number of the drive that contains the control file.

If you are creating a new control file on a diskette, you must enter either the VOLID or drive number. If the control file already exists on your diskette, both of these fields are optional.

SORT and PRESORT

PRESORT (continued)

Sort Group Number (screens 06-034, 06-035, 06-036)

Change Sort Group	06-034
Sort group number —	Required

The Sort Group Number screen is displayed if you selected 4, 5, or 6 on the option menu (change, insert, or delete a sort group). Screen 06-034 is displayed when you select option 4 on the main menu.

The sort group number tells PRESORT which sort group in the control file you want to work with. If you do not know the sort group number, use Cmd 9 to return to the option menu. You can then choose option 7, "Print a control file." This option gives a listing of the sort groups, by number, in your control file. You can then identify the sort group you want to change, insert, or delete.

See "Sort groups" on page 3-72 for more information about sort groups.

SORT and PRESORT

PRESORT (continued)

Summary Statement (screens 06-052—06-056)

Create Control File

06-052

The following refers to the Sort Summary Statement

Display summary information

Y-Display record counts

N-Do not display summary

Y

This screen asks if you want a summary of what happened in the sort—for example, number of records read, number of records in the output file, etc.. If you are doing a simple sort, you will probably want to enter N to omit the summary.

For more information about the summary statement, refer to "Summary statement" on page 3-78.

File Statement (screens 06-062—06-066)

Create Control File

06-062

The following refers to the FILE statement:

Input filename	Required
Input VOLID	Required when input drive number is 5
Input drive number	Optional
Output filename	Required
Output VOLID	Required when output drive number is 5
Output drive number	Optional when output VOLID provided.
Work file VOLID	Required when work file drive number is 5
Work file drive number	Optional when work file VOLID provided.

Address out (A) or Record out (R) sort

B
Native (N) or Alternate (A) collating sequence
N

Cmd 9 Cancel
? Help

This screen lets you define the files to be used. As explained in the introduction to this chapter, you need an input file and an output file. You must specify where these files will be when SORT is run.

If your files are on a diskette, you can either specify the drive containing the diskette with the file or the name of the diskette (the VOLID) with the file.

If your files are on the disk, you must enter the VOLID.

SORT and PRESORT

PRESORT (continued)

You must also specify where the SORT work files will be. If you are not sure, just enter the same information as you did for output VOLID and output Drive Number.

Notice that the "Address out (A)..." prompt and the "Native (N)..." prompts have values filled in. If you are doing a simple sort, you will probably want to leave these values as they are.

For more information about the file statement, refer to "File Statement" in the SORT section of this chapter.

To respond to the File Statement prompts, enter:

Input filename. Enter the name of the file to be sorted. This file must meet the requirements stated in "File statement" in the SORT section of this chapter.

Input VOLID. Enter the VOLID of the disk volume or diskette that contains the above-named input file.

Input drive number. Enter the number of the drive that contains the input file.

Output filename. Enter the name you want to give the sorted output file. It can be up to 17 characters in length. If the output file does not exist, it will be created by the sort program. If the file you specify exists, it must not contain any data; if it does, an error occurs when sort opens the file.

Output VOLID. Enter the VOLID of the disk volume or diskette upon which the output file will be written.

Output drive number. Enter the number of the drive for the output file.

You must enter either the output VOLID or the output drive number.

If the output file is going to a disk volume, you must enter the output VOLID.

Work file VOLID. Enter the VOLID of a disk volume or diskette that the sort program can use for work files. The sort program uses these files to process data without disturbing the input file. After the sort completes, the work files are freed.

Work file drive number. Enter the number of the drive for the work files.

Address out (A) or Record out (R) sort. Enter A to perform an address out sort. Enter R to perform a record out sort. More information about address out sorts and record out sorts is under "Types of sorts" on page 3-65.

Native (N) or Alternate (A) collating sequence. Enter N to use the native System/23 collating sequence, or A to use the alternate collating sequence that resides in your system at sort execution time. The collating sequence is used only when sort is processing character data (type C). More information about collating sequences is under "Collating sequences" on page 3-66.

SORT and PRESORT

PRESORT (continued)

Record Statement (screens 06-072—06-076)

Create Control File

06-072

RECORD SELECTION statement is optional. To skip just press Enter.

Omit (O) or Include (I) records —	Required	
Field starting position —	Required	
Field length —	Required	
Data type (B,C,L,N,PD,ZD) C	More information in help	
Lower limit —	Optional	
Upper limit —	Optional	Cmd 9 Cancel ? Help

This screen lets you specify information about selecting records (from the input file) for the output file.

If you are doing a simple sort, you can just ignore this screen by pressing Enter.

For more information about selecting records for a sort, refer to "Record Statement" in the SORT section of this chapter.

To respond to the Record Statement screen prompts, enter:

Omit (O) or Include (I) records. Enter O to omit or I to include certain records for the sort. These records are defined by the information you specify on the following prompts (Field starting position). The records to be omitted or included will be within the range you define on the upper and lower limit prompts.

When you have finished entering information on the screen and have pressed Enter, the screen will be displayed up to four times. To proceed to the next screen, blank out the O or the I and press Enter. If the field does not contain any values, press Enter and proceed to the next screen.

Field starting position. Enter the starting position where the sort field starts within the record. Refer to the introduction of the simple sort (in this chapter) for examples of fields and field starting positions. The field starting position and the field length define the *select field*. The computer tests the select field to see if it is equal to, or within the field limits. The limits are defined later in this section.

Field length. Enter the length of the select field. See "Field starting position" in this chapter for an explanation of the select field.

Data type. Enter the type of data that the select field contains. Valid entries are C (character), L (BASIC internal numeric), N (numeric character), PD (packed decimal), ZD (zoned decimal) and B (binary).

Lower limit. Enter either a constant or the starting position of a field in the input record. If you enter a constant, you must enclose it in quotation marks. If you enter a field starting position, the contents of that field in each record are set as the lower limit. Each letter has a specific sorting value. If you want to sort using capital letters, specify capital letters in this

SORT and PRESORT

PRESORT (continued)

field. If you want to sort using lowercase letters, specify lowercase letters. If you want to use both capital and lowercase letters, specify them exactly as they are used in the select field.

Make sure that the limit field is the same length as the test field. Except for binary data, the lower limit value is changed to the data type of the select field. It is important that the length and data type for the select field and the lower limit be the same.

If you do not enter a lower limit, only the upper limit is used for comparison, and the lower limit is given the lowest possible value.

Upper limit. Enter either a constant or the starting position of a field (other than the test field) in the input record. If you enter a constant, you must enclose it in quotation marks. If you enter a field starting position, the contents of that field in each record are set as the upper limit. Each letter has specific sorting value. If you want to sort using capital letters, specify capital letters in this field. If you want to sort using lowercase letters, specify lowercase letters. If you want to use both capital and lowercase letters, specify them exactly as they are used in the sort field.

Make sure that the limit field is the same length as the select field. Except for binary data, the upper limit value is changed to the data type of the select field. It is important that the length and data type for the test field and the upper limit be the same.

If you do not enter an upper limit, only the lower limit is used for comparison, and the upper limit is given the highest possible value.

Alts Statement (screens 06-082—06-086)

Create Control File

06-082

ALTS Statement is optional. To skip just press Enter.

Method for altering sequence	Required
RO-Reorder sequence	
EQ-Equate values	

—

Value	Required
-------	----------

—

Characters	Required
_____	Enclose in quotes

Cmd 9 Cancel
? Help

This screen lets you define the collating sequence to be used during the sort.

If you are doing a simple sort, you can just ignore this screen by pressing Enter.

For more information about defining a collating sequence, refer to "Alts Statement" and "Collating sequences" in the SORT section of this chapter, the COLSEQ chapter, and Appendix A.

SORT and PRESORT

PRESORT (continued)

Method for altering sequence. Enter either RO to reorder a part of the collating sequence or EQ to set characters equal to a collating value. An example of using RO is: instead of A B C D E F followed later by a b c d e f, change the sequence to A a B b C c D d E e F f. An example of using EQ is to set the collating value of the digits 1 through 9 equal to the collating value of 0.

Value. If you entered RO above, enter the beginning collating sequence value.

The first character you enter in the "characters" field below is given this value. Make sure that the value is low enough so that it will not increment past 255. For example, if you enter 253 for the value, you can enter a maximum of three characters below.

If you entered EQ above, enter the collating sequence value for the characters you want to be equal to each other.

Valid entries for the value are 0–255.

Refer to Appendix A in this manual for the specific collating sequence value for each character.

Characters. If you entered RO above, enter the characters which are to be reordered, beginning with the value you entered above. If you entered EQ above, enter the characters which are to be given the collating sequence value you entered above.

Remember that, depending upon the collating sequence you are altering, lowercase and uppercase letters may have different values.

The characters you enter must be enclosed in quotation marks. The field length is 30. Because the quotation marks take up two positions, you can enter up to 28 characters.

If you are running PRESORT and want to reorder or equate more than 28 characters, use more than one Alts statement.

SORT and PRESORT

PRESORT (continued)

Mask Statement (screens 06-092—06-096)

Create Control File

06-092

The Sort Key is identified by the MASK statement.
Only one sort field is required. To end, press Enter.

Sort field number - 1

Field starting position Required
—

Field length Required
—

Data type (B,C,L,N,PD,ZD) Optional
C

Sort order Optional

A - Ascending

D - Descending

A

Cmd 9 Cancel

? Help

This screen asks for information about the field in a record that SORT must check to do the sort.

A simple sort usually requires only one field. (You may want to refer to the examples earlier in this chapter.)

You can define up to ten fields for the sort. For this reason, the Mask statement screen can be redisplayed up to ten times. Each screen lets you define one field and how it is to be sorted. The "sort field number" tells you the number of the sort field you are defining.

After you have defined all or your sort fields, leave the screen blank and press Enter. All of the responses you have made to define the sort fields are used to build one *Mask Statement*.

For more information about sort fields and the Mask Statement refer to the "Sort Statements" in the SORT section of this chapter.

To respond to the Mask Statement screen prompts, enter:

Field starting position. Enter the starting position of the sort field starts within the record. Refer to the introduction of the Simple Sort section for examples of fields.

Field length. Enter the length of the sort field. The combined valid range is 1–240. For BASIC internal numeric data (type L), the only valid entry is 9. If you are defining more than one sort field, keep in mind that the sort key length cannot be greater than 240 bytes.

Data type. Enter the type of data that the sort field contains. Valid entries are C (character), L (BASIC internal numeric), N (numeric character), PD (packed decimal), ZD (zoned decimal), and B (binary).

Sort order. Enter A if you want this field sorted in ascending sequence, or D if you want it sorted in descending sequence.

SORT and PRESORT

PRESORT (continued)

Control File Exists (screen 06-142)

Create Control File

06-142

```
WARNING: Control file exists.  
Replace information in control file  
Y-OK to destroy existing data  
N-Do not destroy data  
N
```

This screen appears only if you selected option 2, create a control file, on the menu and then entered the name of an existing control file on screen 06-022.

Enter Y if you want the existing control file to contain the data you are going to enter.

Enter N if you do not want to destroy the existing data in the control file. After you press Enter, screen 06-022 reappears. You should then enter the name of a control file that does not exist.

Print Control File--Output(screen 06-157)

Print Control File

06-157

Information and messages to:

- 1 - Screen only
- 2 - Screen and printer
- 3 - Printer only
- 2

Printer number:

- 10-First printer
- 11-Second printer
- 10

Required when
printer used

This screen appears only if you selected option 7, print a control file, on the menu.

Information and messages to. Select 1 if you want to review the contents of the control file on the screen. Select 2 to both display this information on the screen and to print it on the printer. Select 3 to only print the control file. If you select 2 or 3, your System/23 system must have a printer attached. If it does not, an error will occur.

Printer number. If you entered a 2 or 3 above, select the printer to be used.

SORT and PRESORT

PRESORT (continued)

Contents-of-Control-File (screen 06-167)

Print Control File

06-167

Sort control file - TEST

* SUM Sort complete,Records were read,Records were selected,Record *
* s were output,Press Enter to continue *

* !This is an example of a comment statement. *
* *

* FILE test.input,,1,test.output,tstvol,2,tstvol,2,R,N *
* *

* ALTS RO,12,"abcdefg" *
* *

* RECORD i,23,4,C,45,55 *
* *

* MASK 1,23,C,A *
* *

Press Enter to continue

Cmd 9 Cancel

This screen appears only if you chose to review the contents of the control file on the display on screen 06-157.

This screen gives the name of the control file being printed. The control file name is then scrolled up on the screen. The advantage of printing the control file is that the statements are shown divided into sort groups.

PRESORT operating considerations

PRESORT work files. PRESORT uses a work file named PRESORT.WORKXX (where XX is a two-digit work station ID). The work file is placed on the same diskette as the control file or on a disk volume (see screen 06-02X). As you respond to the PRESORT screens, the sort statements are written to the work file.

If PRESORT completes successfully, the work file is renamed with the control filename and the control file is freed. If it does not complete successfully, the work file is not renamed. It is freed and the control file is restored to its original condition.

Alts and Record Statements Prompting. Because a sort group can have more than one Alts and Record statements, the screens for these statements can appear more than once.

To omit either of these statements or to indicate that you do not want to create any more of them, leave the first prompt on the screen blank. Just press Enter and the next screen in the sequence appears.

Prompting for changing a sort group. If you are changing a sort group that does not contain Summary, Comment Alts or Record statements, the screens for these statements still appear during the prompting sequence in case you want to add any of them. Remember, PRESORT separates sort groups using the mask statement.

Adding an Alts Statement. When you add an Alts statement to a sort group that does not already contain one, the order of sort statements is very important. The Alts statement must precede the Record statement in the control file.

SORT and PRESORT

PRESORT (continued)

When you are changing a sort group, PRESORT displays the sort statement screens you filled in when you created the control file, except for the summary statement, which is always displayed with the default value of "Y." Suppose you didn't use the Alts statement and you did use a Record statement. The order of the sort statement screens will be: File Statement, Record Statement, and Mask Statement.

In order to get the Alts statement screen to appear, follow these steps:

- When the Record statement appears, blank out the input fields on the screen. This information will have to be reentered later—after the Alts statement entries are made. If the sort group contains more than one Record statement, blank out the contents of all of them.
- Then press Enter, and the Alts statement screen appears. Add as many Alts statements as you want.
- After you have entered the Alts statements, leave the first prompt on the screen blank and press Enter. The Record statement screen then appears.
- Enter the Record statements (up to 4) that you want.

You may find it simpler to just delete that sort group. Then you can use the "Create a control file" option to reenter the information for that control file.

Reviewing your entries for creating control file. If you want to review what you entered to create a control file, you can use option 7. Be aware that this output will show the information in the form of sort statements. If you want to review what you entered--and see it in the screen format as you entered it--use option 4, change a sort group. Then you can see the sort statement screens, filled in as you did when you created the control file, except for the summary statement, which is always displayed with the default value of "Y."

SORT and PRESORT

SORT

SORT is the Customer Support Function that creates a sorted output file. SORT differs from other Customer Support Functions in that it is started by using the SORT command, rather than LINK. It also has no screens or prompting. As you saw in the examples earlier, SORT is very simple to use once the control file is built.

SORT uses two files—the control file and the input file to create the output file of sorted records.

You can run SORT from a procedure file. Just use this statement:

```
SORT control filename
```

After SORT is started, you can cancel it by using Cmd Attn followed by Cmd Error Reset.

Functions of sort

The main function of SORT is to rearrange the order of records in a file. SORT uses information from the control file to perform the functions you specify. Some functions of SORT are:

- Create an output file that contains records (*record-out sort*) or just the addresses of records (*address-out sort*) in the sorted order.
- Test the contents of up to four fields in each input record to decide whether to include or omit the record from the output file.
- Use up to ten different fields to put the records in order. The fields can contain any type of data (such as character or binary), and each field can be sorted in ascending or descending sequence.

-
- Alter the collating sequence to be used for sort fields which contain character type data. The base collating sequence can be either the Native EBCDIC sequence or an alternate collating sequence loaded by the COLSEQ Customer Support Function. (COLSEQ functions are described in the COLSEQ chapter.)
 - Run more than one sort, one right after the other, without operator intervention.
 - Display statistics on the number of records processed.

Types of sorts

An *address out sort* produces an output file of relative record numbers of some or all of the records in the input file. These relative record numbers point to records in the input file. The output file has only three bytes per selected record. It therefore uses a minimum of space. To process an address out file, you use a BASIC program that reads relative record numbers from the address out file and then retrieves those records from the input file. (For an example of this, see the end of "Example 2. A More Complex Sort.")

A *record out sort* produces an output file of records from the input file sorted as specified in the control file. Each output record is a copy of an entire input record; the input and output files have the same record length.

Note: Remember, the output file from the address-out sort is good only as long as the input master file is not changed. If you make changes to your input master file, you will have to create a new output file.

SORT and PRESORT

SORT (continued)

Collating sequences

A collating sequence is used only when sort is processing character type data; that is, only if you specify character type data in a Record or Mask statement. Also, the collating sequence and any Alts statements are used only for the sort group that contains them.

You can use the native collating sequence or an alternate collating sequence. If you use an alternate collating sequence, make sure that the alternate collating sequence you want is loaded before the sort program begins running. For more information on collating sequences, see "COLSEQ" chapter and Appendix A, "Collating Sequence Table."

At sort execution time, the sort program copies either the native or the alternate collating sequence into the sort area in storage. Then, if the sort group contains any Alts statements, they are used to change the sequence.

The collating sequence that you specify (and possibly alter) is used only by the sort group in which it is contained. The collating sequence resident in the system remains unchanged.

Sort fields and the sort key

The sort program puts the records in order by using the sort key. The *sort key* is made up of all of the sort fields. The sort fields (up to ten) defined in the Mask statement are combined to form the sort key. Each sort field can be any data type and can be sorted in ascending or descending sequence.

If you have more than one sort field, the first sort field plays the largest role in putting the records in order. Each additional

field you define plays a smaller role in determining the final order of the sorted records.

For example, assume you define the following sort fields:

Sort field number	Field description	Sort order
01	zip code	A
02	customer name	A

The sort output would begin with the lowest zip code. Records for all the customers with this zip code would be in alphabetic order by customer name. The next part of the output would consist of customer names in alphabetic order for the next highest zip code.

The length of the sort key is related to the data type and the length of the sort field(s). It can be up to 240 bytes long. Key lengths for the data types are shown below. FL is the length of the sort field in the input record.

Data type Key length for a single field

N and ZD	$(FL/2) + 2$
C and B	FL
PD	FL + 1
L	FL = 9

Files used by SORT

Once you have created the control file, you are ready to really

SORT and PRESORT

SORT (continued)

sort the records in the data file. After you enter the BASIC command SORT and the control file name, SORT does its processing using the following files:

The *control file* tells the sort program what to do. It includes the name of the input file and how the records are to be rearranged.

The *input file* is the file to be sorted. It must be a record I/O file. The data in this file is used to create the output file. The input file is not changed.

The *work files* are areas on a diskette or the disk where SORT stores temporary data. These files are not generated for small address out sorts.

The *output file* contains either the records or just the addresses of the records in the sorted order. SORT writes this file on diskette or disk.

Input file. The input file is the file to be sorted. It must have been created by the System/23. Sort does not process key-indexed files (types 07 and 08).

Output file. The output file, created by the SORT program, contains the records or record addresses in the ordered sequence. It is written to diskette as a type 04 file or to a disk file.

The size of the output file depends on the type of sort. Because a record out sort writes entire records from the input file to the output file, the output file can be the same size as the input file. If records are omitted by using the Record statement, the output file will be smaller than the input file. If the input file has deleted records, the output file will also be smaller. The output file of a record out sort has the same

record length as the input file. These output files always have an additional byte that allows records to be deleted.

An address out sort writes only relative record numbers to the output file. Each record is three bytes long and is in packed decimal format. Therefore, the output file can be smaller than the input file. Records cannot be deleted from this type of output file.

You can estimate the size (in bytes) of the output file as follows:

- For a record out sort: Bytes=Number of records selected x (record length + 1) [Round up to a multiple of 512]
- For an address out sort: Bytes=Number of records selected x 3 [Round up to a multiple of 512]

Work files. Depending upon the number of records in the input file and the length of the sort key, the sort program may not have enough room to sort all the records in place. If it does not, it needs to use work files. The work files are temporary storage on a diskette or the disk; the File statement identifies the disk volume or diskette to be used. Sort automatically creates the work files and automatically frees them.

The sort work files are named SORT.WORKXX and SORT.ADDRXX where XX is a two-digit work station ID. Therefore, do not use these names for any of your files.

You can estimate the amount of space needed for the work files as follows:

- For a record out sort: Number of records selected x (sort key length + 6) [Round up to a multiple of 1024]

SORT and PRESORT

SORT (continued)

- For an address out sort: Number of records selected x (sort key length + 4) [Round up to a multiple of 512]

The Control File, Sort Groups, and Sort Statements

Because the format of the SORT command requires a control file name, a control file is always needed to run a sort. A control file consists of one or more sort groups. A *sort group* is a set of statements which describes how you want a file to be sorted. A *sort statement* is one of the statements in a sort group. It gives specific information about the sort to be performed.

The statements that can be part of a sort group are:

- **Summary**—tells sort to display statistics after the file is sorted. This statement is optional.
- **Comment**—allows you to describe or document the sort in your own words. The sort program displays up to five Comment statements while it is sorting a file. This statement is optional.
- **File**—identifies the files, type of sort, and collating sequence to be used. Each sort group must contain one and only one File statement.
- **Alts**—allows you to make changes to the collating sequence. The changes are used only for the sort group that contains them. The Alts statement is optional.
- **Record**—allows you to test each record in the input file against a lower and/or upper limit, and either include or omit the record from the output file. A sort group can contain up to four Record statements. The Record statement is optional.
- **Mask**—identifies up to ten sort fields and the order of the sort for each field (either ascending or descending). A

sort field is a field in the input record which is used to set up the sequence of the output file. A sort group must contain one and only one Mask statement, and it must be the last statement in the group.

The Control File

You can create a control file in two ways: run PRESORT or write a BASIC program to create the file. Running PRESORT is the recommended method because you do not have to be concerned with the order or format of the sort statements.

Using a BASIC Program to create a control file. If you plan to write a BASIC program to create a control file, you need to know about its structure, namely:

- The control file must be a file type 04 and it must have a record length of 128 bytes.
- Two sort statements, File and Mask, must be included in each sort group. The Mask statement separates one sort group from another, and it therefore must be the last statement in each group.
- There are rules about the order of statements within a sort group. See the chart under "Sort statement summary" on page 3-80.
- Each sort statement has a specific format. The statement formats are shown with the appropriate PRESORT screens.
- Each sort statement occupies one 128 byte record of the control file.

Advantages of using Presort to create a control file.

Although you can write a BASIC program to create the control file, it is recommended that you use PRESORT because:

SORT and PRESORT

SORT (continued)

- As you respond to each screen, PRESORT checks the data you enter for errors. If you make a mistake, you must correct it before you go on. This ensures that the sort statements being created are in the correct format.
- PRESORT allows you to change existing sort statements.
- PRESORT automatically writes the sort statements to the control file in the required order.
- One of the menu options allows you to print the contents of an existing control file. This is useful if you are updating, inserting, or adding a sort group.

Sort groups

A Sort group is a group of statements that identifies a sort process. A control file can contain one or more sort groups. A sort group number is a number that PRESORT assigns to a sort group when it writes the group to the control file. The groups are numbered in ascending sequence, starting with 1.

If a control file contains more than one sort group, SORT runs one sort for each sort group, one right after the other. If a control file contains three sort groups, the sort program runs three times and produces three output files. You can sort the same file three times.

If a control file contains more than one sort group, you cannot run just one sort because you identify the control file, not the sort group, to SORT.

If a control file contains more than one sort group and an error occurs while sort is running, the remaining sort groups are not processed. For example, if a control file contains three sort groups and an error occurs during the second sort, processing

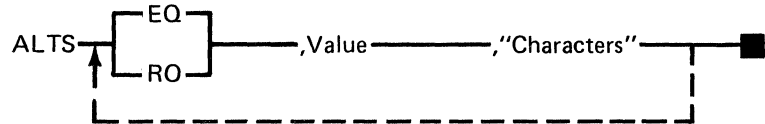
ends and the third sort group is ignored. Only the first sort will be completed.

Sort statements

This section is used to describe the purpose and syntax of each of the SORT statements. For an exact definition of each of the parameters, refer to the Presort screen that corresponds to the Sort statement.

Alts statement. The Alts statement defines changes to the collating sequence to be used during the sort. First, the collating sequence identified in the File statement (native or alternate) is copied into the sort area. Then, if the sort group contains any Alts statements, they are used to change the collating sequence in the sort area; the collating sequence in the system remains unchanged.

Note that under "character" upper and lower case have different meanings.



Comment statement. The Comment statement allows you to document the sort you want to perform. This statement is optional.

If you are running PRESORT, you can enter up to five Comment statements. You can use up to three lines on the screen for each statement.

If you are writing a BASIC program, you can include as many Comment statements as you want. However, during sort

SORT and PRESORT

SORT (continued)

execution, only the first five are displayed. Comment statements can be placed anywhere in the sort group before the Mask Statement.

Each Comment statement can be up to 128 bytes long. The text that you enter may span multiple comment statements.

!—— char-string ——■

File statement. The File statement identifies the files, type of sort and the collating sequence to be used. Each sort group must contain one and only one File statement.

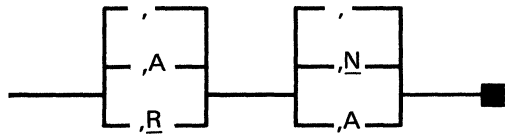
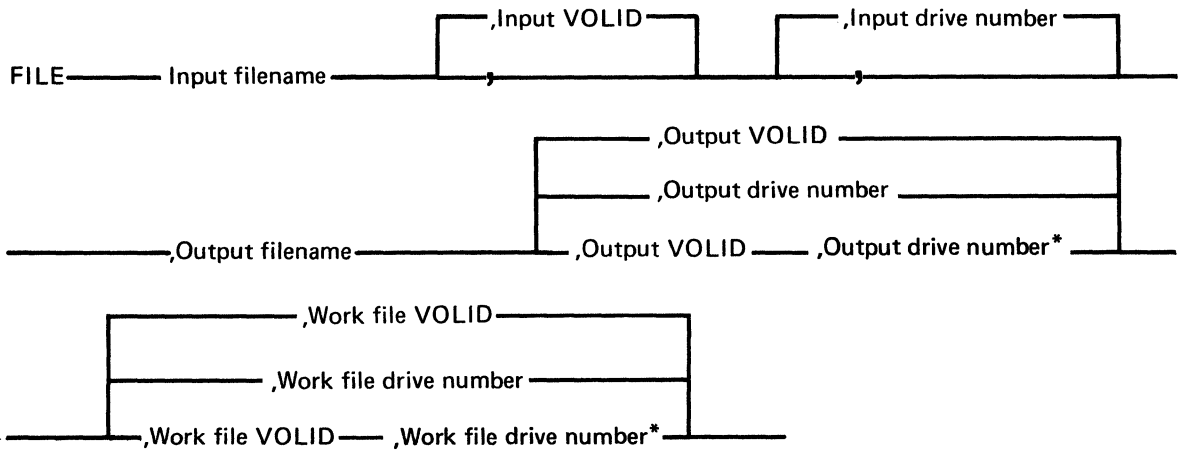
You will need to specify information about the input file, the output file for the sorted records, and work files.

The file statement also specifies the sort type—Record out or address out.

An address out sort produces an output file of relative records numbers (in packed decimal format) that indicate the relative positions (1st, 20th, 99th) of records in the input file. These relative record numbers are pointers, in the sorted order to records in the input file.

A record out sort produces an output file of records from the input file in the sorted order. All of the fields in the input records are written to the output file; the output file contains complete records in a different sequence than that of the input file.

The file statement also specifies what collating sequence will be used. (See "Collating sequences" on page 3-66.)



*For disk files, specify both the VOLID and the drive number.

For example, assume that you are putting together a mailing list and want to include only those customers who are 50 years of age or older. To do this, you could define a Record statement with I (include) and a lower limit of 50, or one with O (omit) and an upper limit of 49.

A sort group can contain up to four Record statements. They are optional. If a sort group does not contain any Record statements, all non-deleted records in the input file are sorted. If more than one Record statement is included, the record must meet the condition in each statement in order to be included in the sort. This means that multiple Record statements define a set of logical "AND" conditions.

For example, assume that you want to select records only for the cities Boston, Dallas' and Pittsburgh from an input file. You need to test for three equal conditions on one field. You could use these Record statements:

	Include/ Omit	Lower limit	Upper limit
Record statement 1	I	"BOST"	"PITT"
Record statement 2	O	"BOSU"	"DALK"
Record statement 3	O	"DALM"	"PITS"

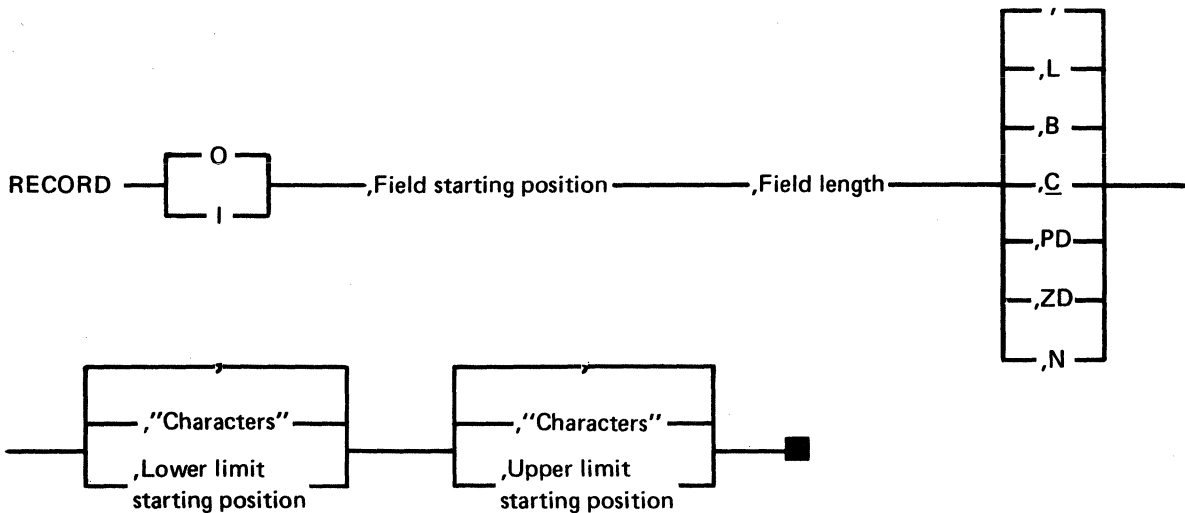
The first Record statement includes all Records between and including Boston and Pittsburgh. The second omits all records after Boston and before Dallas; the third omits all records after Dallas and before Pittsburgh.

The rule for applying record statements is that you may have no more than one Include record statement applied to each select field. For example, if your select files were **age, height**

SORT and PRESORT

SORT (continued)

and **weight**, you could have no more than one Include record statement for each of these fields.



Summary statement. Putting the Summary statement in a sort group causes the sort program to display record counts after the file is sorted. This statement is optional. If it is included, record counts are displayed and the SORT then waits for you to press Enter. This statement should therefore be included only when SORT is to be run in attended mode.

The record counts are:

- Number of records that were read, that is, number of records in the input file, including deleted records.
- Number of records that were selected for inclusion in sort processing. The Record statement defines the criteria for including and omitting records.

-
- Number of output records, that is, the number of records written to the output file.

SUM— Title1 —, Title2 —, Title3 —, Title4 —, Title5 —■

If you are coding the Summary statement in a BASIC program, you can place it anywhere before the Mask statement in the sort group. SORT always displays the record counts in the order given above. Each title must begin with a letter, and the titles must be separated by commas. The information you enter for the titles should match these meanings:

Title1	Sort successfully completed
Title2	Records read
Title3	Records selected
Title4	Records output
Title5	Press Enter to continue

Sort statements and PRESORT screens

This chart provides a summary of the sort statements. You need to use this chart only if you are writing a BASIC program to create a control file. Use this chart to decide which statements you want to code and to put the statements in the correct order.

SORT and PRESORT

SORT (continued)

Sort statement summary

Sort statement	Statement identifier	Required or optional	Maximum number in each sort group	Order within the sort group	Associated with screen
Summary	SUM	Optional	One	Anywhere before MASK	06-05X
Comment	!	Optional	Unlimited but only 5 are displayed		06-04X
File	FILE	Required	One	Anywhere before MASK	06-06X
Alter sequence	ALTS	Optional	Unlimited	Must follow File	06-08X
Record	RECORD	Optional	Four	Must follow File and ALTS (if given)	06-07X
Mask	MASK	Required	One	Must be last	06-09X

Performance considerations

The amount of time required to run a sort can vary greatly. Most of the run time for a sort consists of reading from and writing to diskette or disk. Some factors that affect the run time are:

- Number of records to be sorted. The fewer records you want to sort, the less time the sort takes to run.
- Type of sort. An address out sort takes less time to run than a record out sort because fewer reads and writes are required.
- Record statement(s). By using one or more record statements, you can select records for the output file. This can reduce the number of records to be sorted and therefore reduces the time to sort them.
- Length of sort key. The shorter the sort key, the less time the sort takes to run.
- Location of the input file on the diskette or disk. An input file that is located on a continuous area takes less time to sort than one that is not. You can use the Copy Customer Support Function to place the input file in a continuous area before you run the sort.
- Order of records in the input file. Suppose that two files contain the same records. The first file, however, has more records in the sequence you want than the second. If the same sort statements are used, the records in the first file can usually be sorted faster than those in the second file.
- Record size. The smaller the records in the input file, the less time the sort takes to run.
- Storage size of your computer. If your System/23 has the minimum storage and you are sorting small files, then

SORT and PRESORT

SORT (continued)

sort run times will be satisfactory. As the number of records to be sorted grows, run time will increase.

If your machine does not have enough storage for all of the sort keys, SORT stores them in a work file. Reading from and writing to the work file will add to the sort run time. For some sorts, a small machine may require a work file whereas a larger machine may not. Therefore the run time for the sort on the larger machine would be less than on the smaller machine.

Chapter 4. INDEX

Introduction

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), INDEX is on diskette VOL001.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

Create Index File (**INDEX**) creates an index file for a master file. The index file is used to find records in the master file based upon the contents of a specific field in the master file.

Using an index file is like finding the beginning of a chapter in a book. You can think of the chapters as records in the master file and the Table of Contents for the book as an index file.

Rather than going through the book page by page looking for a certain chapter, you can use the Table of Contents. It tells you the exact page number of the beginning of the chapter. Therefore, you can go right to the page you want, which saves a lot of time. Similarly, by using an index file, you can go right to a record in the master file.

What is an index file?

The index file contains a record key and a relative record number for each record in the master file.

A *record key* is one or more characters within a record that identify the record. It is usually a field, such as customer number or item number.

The *relative record number* tells the location of the record in the master file by indicating its position in relation to the start of the file. The first record that is stored on a diskette file has a relative record number of 1. The twentieth record in the same file has a relative record number of 20.

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Introduction (continued)

The following is an a master inventory file and its index file.

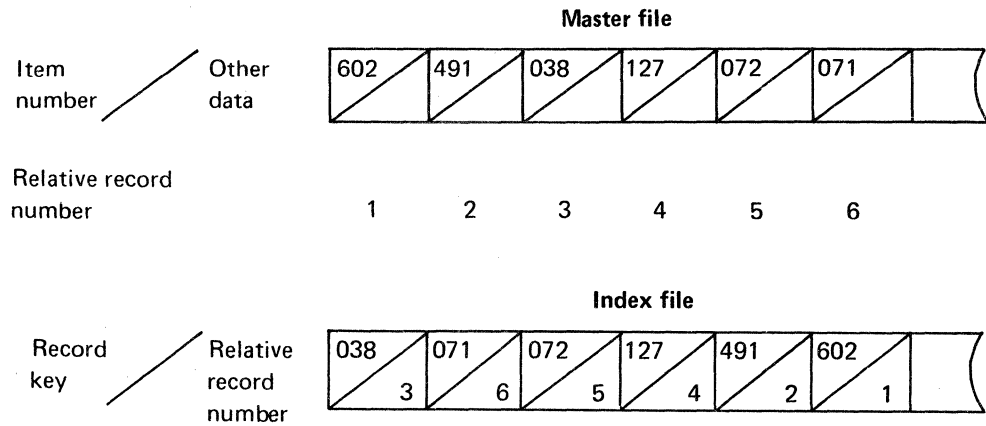


Figure 4. Master inventory file and index file

Figure 4 illustrates a master inventory file and its index file.

Each record in the master file contains an item number and other data about each inventory item. The record key is the item number. Therefore, each entry in the index file contains an item number and the relative record number of that item in the master file.

The entries in the index file are placed in ascending sequence by item number. The native collating sequence is used to determine the order. For more details on the collating sequence, see the "COLSEQ" chapter and "Appendix A, Collating Sequence Table."

How an index file is used

Assume that the index file in the preceding example does not exist and your program needs to retrieve the master file record for item 072. To do this, it reads the master file sequentially, starting with the first record, until it finds the record for item

072. Thus it would have to read the first four records in the file before the right record is found. Retrieving a record from a file in this manner is called *sequential access*.

Using the key-indexed access method. If a master file has an index file, a record in the master file can be retrieved using the *key-indexed access method*.

To use the key-indexed access method to get the master file record for item 072, the program does the following:

- First it goes to the index file and searches it for record key 072. It finds 072 quickly because the keys are sorted in ascending sequence.
- The program then reads the relative record number for item 072, which is 5.
- It then goes directly to the fifth record in the master file. It does not have to search the master file from the beginning.

Record keys for an index file

The record key for an index file can be up to 28 characters long. It must consist of continuous characters in the master file record but can span more than one field in the record. For example, if the master file record contains a six-digit item number starting in position 10 and is immediately followed by a two-digit inventory location, you can define the key length as 8, starting in position 10.

INDEX

Introduction (continued)

Duplicate keys. A *duplicate key* is a key that is exactly the same as another key in the file. INDEX allows you to choose whether you want to include duplicate keys in the index file. If they are included, each entry in the index file is still unique because the relative record number is part of the entry.

If you specify that duplicate keys are not to be included but INDEX finds them, an index file is not created. However, INDEX keeps reading records from the master file and it keeps track of the duplicate keys it finds so that you can review them (see screen 04-122).

Structure of an index file

When an index file is created, continuous diskette or disk space is reserved for a primary area and an overflow area. At this time, all entries are placed in the primary area in ascending sequence by record key. Duplicate keys are flagged as they are written to the file. Figure 5 on page 4-5 shows a master file and its index file just after the index file has been created.

Master file		Index file (type 07)			
Key field	RRN	Key	RRN	Flags	
				Duplicate	Overflow
C	001	A	003	X	
E	002	A	007		
A	003	B	005		
E	004	C	001		
B	005	D	006		
D	006	E	002	X	
A	007	E	004	X	
F	008	E	009		
E	009	F	008		

Figure 5. Master file and index file after the index file has been created

Figure 5 shows that A and E are duplicate keys. All duplicate keys except the last one are flagged. The index file shows that A/007 and E/009 are not flagged as duplicates because they are the last duplicates of A and E. Also, because the file was just created, overflow flags are not set because there are no entries in the overflow area.

When you use the key-indexed access method to access a master file that is being updated, the index file is also updated. This means that each time a record is added to the master file, an entry is also added to the index file.

Figure 6 shows that when the record with key G is added to the master file, it is also added to the index file in the overflow area. Because G follows F in the sorted sequence, the overflow flag for record F/008 is set to indicate that the next record is in the overflow area.

INDEX

Introduction (continued)

Master file		Index file (type 08)			
Key field	RRN	Key	RRN	Flags	
				Duplicate	Overflow
C	001	A	003	X	
E	002	A	007		
A	003	B	005		
E	004	C	001		
B	005	D	006		
D	006	E	002	X	
A	007	E	004	X	
F	008	E	009	X	X
E	009	F	008		X
G	010	G	010		
E	011	E	011		

Primary area

Overflow area

Figure 6. Updated master file and index file

When a record with a duplicate key such as E/011 is added to the master file, two flags are set in an index file entry in the primary area. The duplicate flag for record E/009 is set to indicate that it is a duplicate key, and its overflow flag is set to indicate that the next record in the sequence is in the overflow area.

When an index file is created, it is a file type 07. The first time a record is added to a master file and its index file, the file type of the index file is changed to type 08. File type 07 is an index file with no entries in the overflow area. As soon as a record is added to the overflow area, the file type becomes 08.

Space required for an index file

When an index file is created, the system automatically reserves space for it. You can estimate the amount of space (in bytes) reserved as:

$$512 \left(\text{INT} \left(1.10 \left(\text{INT} \left(\frac{\text{NR}}{\left(\text{INT} \left(\frac{512}{\text{KL}+4} \right) \right) - 1} \right) + 1 \right) \right) + 1 \right)$$

1.10 means 110% ; the additional 10% is reserved for the overflow area. INT is the integer. NR is the number of records in the master file. KL is the length of the record key.

For example, when KL=9 and NR=5,000:

$$\begin{aligned} \text{INT}(512/\text{KL}+4) &= 39 \\ 39-1 &= 38 \text{ keys per block} \end{aligned}$$

$$\begin{aligned} \text{INT}(5,000/38) &= 131 \\ 131+1 &= 132 \text{ blocks for sorted key area} \end{aligned}$$

$$\begin{aligned} \text{INT}(1.10(132)) &= 145 \\ 145+1 &= 146 \text{ blocks for sorted area and overflow area} \end{aligned}$$

$$512 * 146 = 74,752 \text{ bytes reserved for the index file}$$

When the overflow area is full, more space is automatically reserved, but it will not always be next to the existing overflow area.

INDEX

Introduction (continued)

Multiple index files

A master file can have more than one index file. This allows you to use different record keys to access the same master file.

For example, depending upon the processing to be done by your program, you could access an inventory master file either by item number or vendor number. However, using the vendor number as a key would probably result in duplicate keys in the index file. Usually the key is a unique identifier, such as an item number or customer number, but this is not required.

If you have more than one index file for a master file, only the index file being used to access the master file is updated at the same time as the master file. The reason for this is that the BASIC statements OPEN and WRITE allow you to name only one index file. To keep the other index files up to date, you should run INDEX periodically. At a minimum, you should replace all index files for a master file each time you back up the master file. To replace means to allow INDEX to destroy the contents of an existing index file and replace it with the new index file.

You should also replace all index files after you copy the master file and remove deleted records (see the COPY chapter in volume 1).

Function of INDEX

Creating an index file is the only function of INDEX. Once INDEX has created an index file, you can use the key-indexed access method to retrieve records from the master file.

When to use key-indexed access

Because key-indexed access is faster than sequential access, you should think about using the key-indexed access method if:

- The master file is very large. As the number of records in the master file increases, the time it takes to access records sequentially also increases. If the key-indexed access method is used, a program does not have to search the entire master file to find a record.
- The records in the master file are not sorted or kept in order. An index file is always ordered; that is, the entries are kept in ascending sequence by record key. To order the records in a master file you need to sort the file. Using the key-indexed access method allows a program to access, in sequence, the master file records without keeping them in sequence.
- You want to inquire often into the master file. Using the key-indexed access method for inquiry applications provides both fast response time and flexibility in retrieving a master file record. You can have more than one index file for a master file. Therefore you can retrieve a record from the master file by using different record keys. See "Multiple index files" in this chapter.

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Running INDEX

You should run INDEX when you need to:

- Create a new index file
- Update an index file that was not updated along with the master file
- Place all index file entries in the primary area

The key-indexed access method works faster when all entries are in the primary area. Access time increases when there are flags and pointers between entries in the primary and overflow areas of the index file.

If the file type of the index file is 08, the overflow area contains entries. If the index file has multiple extents, the original overflow area is full and other overflow areas, which may be on non-continuous space, also contain entries. (You can use the DIR command to tell if the file has multiple extents.)

In both of these cases, you should run INDEX to place all index file entries in the primary area. This ensures that the key-indexed access method will work as fast and efficiently as possible.

Before you begin

You need to have a disk volume or diskettes for the master, index, and work files. You also need to know the starting position and length of the field in the master file to be used as the record key.

You can also run INDEX from a procedure file. For details on how to do this, see "Procedure file (screen 04-169)."

Operating considerations

The master file must be a type 04 (internal I/O). However, the type 04 file created by an address-out sort is not allowed as a master file and will cause you to get a 7609 error code.

Depending upon the number of records in the master file, the length of the record key, and the storage size of your System/23 INDEX may need to use a work file. The work file is named INDEX.WORKXX, where XX is a two-digit work station ID. The INDEX will create this file for you, and free it after it is used.

On a system with 32K storage and no disk unit, if you remove the diskette that contains INDEX during processing, you may get messages to insert it again.

When you want to go back to the option menu, press and hold the Cmd key, and press 9 or the numeric key pad to the right of the keyboard. You can do this only when the screen has Cmd 9 cancel in the lower right corner.

If you want to stop processing, press the Cmd key, then the Attn key to return to READY INPUT.

A data file created without a FORM statement will contain extra system bytes. See "Internal I/O file formatting" in *BASIC Language Reference* for record formats.

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Running INDEX (continued)

If you create an index file on a diskette that is almost full, you may get a 4138 error code (not enough contiguous space on diskette)—even though there appears to be enough continuous space available. This occurs because index files must begin at certain places on the diskette (called track boundaries). Re-arranging the files on the diskette may help to give you more continuous space; however the *maximum* number of index files that you can put on a diskette is:

Diskette type	Total number of labels	Maximum number of index files
Type 1	65 – 70	65
Type 2	131 – 134	131
Type 2D	130 – 133	130

The *actual* number of index files that you can put on a diskette may be fewer than the above numbers. The actual number depends on:

- The number of labels you specified when you prepared the diskette
- The size of your index files
- The size of any other files on the diskette
- Whether there are any bad sectors on the diskette

Example of using INDEX

Note: If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), INDEX is on diskette VOL001.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

Suppose you have a master file named ITEM on a diskette and the file contains these four records.

000001nuts	1800	.29	522.00
00002bolts	1500	.39	585.00
12345screws	850	.11	93.50
10008nails	5000	.02	100.00

You want to create an index file for the master file ITEM. The key will be the item number which starts in position 1 and is five characters long. The name of the index file will be ITEMX.

You will need the INDEX Customer Support Function and the master file ITEM.

1. Insert the Customer Support Functions diskette into a diskette drive.
2. Enter: LINK INDEX

INDEX

Example of using INDEX (continued)

The following option menu should appear on your screen:

Create Index File Menu

04-010

Choose one of the following:

1. Description of Create Index File
2. Create Index File

9. End Create Index File

Choice

2

Remove the Customer Support Functions diskette and insert the diskette containing the master file ITEM. Enter a 2 to select the Create Index File option.

The next screen requests information about the master file and the key. The master file is ITEM and it is in drive 1. The key is the item number. It starts in position 1 and is five characters long.

Create Index File		04-052
Master Filename ITEM	Required	
VOLID _____	Required when drive number is 5.	
Drive number 1	Optional	
Key field length 5	Required	
Position in record where key field starts 1	Required	
		Cmd 9 Cancel ? Help

The next screen requests information about the index file. The name of the index file will be ITEMX. If the file does not already exist, it will be created. If the file exists, it will be replaced by the new ITEMX data.

INDEX

Example of using INDEX (continued)

If you are using diskettes, you should create your index file on the same diskette as your master file.

The Y response allows the same item number to be used for more than one item.

Create Index File

04-062

Index Filename

ITEMX

Required

VOLID

Required for drive 5.
Optional when drive number
1-4 provided and no
index file exists.
Not required if index
file exists on diskette.

Drive number

1

Optional when VOLID
provided and no
index file exists.
Not required if
index file exists.

Include duplicate
keys in index file
Y-Allow duplicate keys
N-No duplicate keys

Y

Cmd 9 Cancel
? Help

The next screen requests information about how you want your output. You can just press Enter because you want messages displayed and printed, and you want to use the system printer (10).

The messages include any duplicate keys in the master file and any error messages.

Create Index File

04-092

Information and messages to:

- 1-Screen only
 - 2-Screen and printer
 - 3-Printer only
- 2

Printer number

Required when
printer used

- 10-First printer
 - 11-Second printer
- 10

List duplicate keys

- Y-Display and/or print duplicate keys
 - N-Do not list duplicate keys
- Y

Cmd 9 Cancel
? Help

The next screen indicates the index file is being created.

Create Index File

04-102

Create Index File in progress.

INDEX

Example of using INDEX (continued)

When your index file is created, the next screen is displayed. This screen tells you how many records are in the file ITEM. It also shows how many keys are in the index and if there are duplicate keys.

Create Index File

04-112

Statistics:

Master records read	4
Keys written	4
Duplicate key strings	0
Duplicate keys	0

The completion screen is then displayed.

Create Index File

04-142

Create Index File successful.

Your index file now contains the following:

Key in ITEM	Record number
00001	1
00002	2
10008	4
12345	3

After you press Enter, the INDEX option menu is redisplayed.

INDEX

Screens

The following screens can appear while you are running INDEX. They are presented in ascending sequence by screen number. This is not always the order in which they appear while you are running INDEX.

Completion screens and in progress screens are not included in this section

Menu (screen 04-010)

Create Index File Menu

04-010

Choose one of the following:

1. Description of Create Index File
2. Create Index File

9. End Create Index File

Choice

⋮

Select 1 to see three screens (04-021, 04-031, and 04-041) that describe INDEX. After screen 04-041 is displayed, the program returns to this menu.

Select 2 to create an index file.

Select 9 to end INDEX. The system then returns to READY INPUT status.

Master file (screen 04-052)

Create Index File

04-052

Master filename

Required

VOLID

Required when
drive number is 5.

Drive number
_

Optional

Key field length
_

Required

Position in record where
key field starts

Required

Cmd 9 Cancel
? Help

Master filename. Enter the name of the master file to be used to create the index file.

VOLID. Enter the VOLID of the disk volume or diskette that contains the above-named master file.

Drive number. Enter the number of the drive that contains the above-named master file.

Key field length. Enter the length, in bytes, of the record key in the master file record. The valid range of values is 1-28.

INDEX

Screens (continued)

Position in record where key field starts. Enter the starting position in the master file record of the record key. The first position in a record is position 1. The valid range of values is from 1 to (record length minus key field length) plus 1.

Index file (screen 04-062)

Create Index File

04-062

Index Filename

Required

VOLID

Required for drive 5.
Optional when drive number
1-4 provided and no
index file exists.
Not required if index
file exists on diskette.

Drive number

Optional when VOLID
provided and no
index file exists.
Not required if
index file exists.

Include duplicate
keys in index file
Y-Allow duplicate keys
N-No duplicate keys
N

Cmd 9 Cancel
? Help

Index filename. Enter the name of the index file to be created.

VOLID. Enter the VOLID of the disk volume or diskette where the index file will be written.

Drive number. Enter the number of the drive for the index file.

You must enter either the VOLID or drive number.

INDEX

Screens (continued)

Include duplicate keys in index file. Enter Y to include duplicate keys in the index file. A duplicate key is a key that is exactly the same as another record key in the file.

Enter N if you do not want to include duplicate keys in the index file. If you enter N and INDEX finds duplicate keys, an index file is not created.

Index file exists (screen 04-072)

Create Index File

04-072

WARNING: Old index file exists.

Replace information in index file

Y-OK to destroy existing data

N-Do not destroy data

N

This screen appears only if you entered the name of an existing index file on screen 04-062.

Enter Y to replace the contents of the existing index file with the index file you are creating now.

Enter N if you do not want to destroy the existing data in the index file. After you press Enter, prompt 04-062 reappears with error code 7611 on the status line. Press Error Reset and then enter a filename that does not already exist.

INDEX

Screens (continued)

Work file (screen 04-082)

Create Index File

04-082

This Customer Support Function may require diskette or disk work space. It will look for enough space to create a work file called INDEX.WORK. At the completion of this function, the work file will be freed.

Work file VOLID

Required when
drive number is 5.

Work file drive number

Optional when
VOLID provided.

Cmd 9 Cancel
? Help

This screen appears only if INDEX needs work space.

Work file VOLID. Enter the VOLID of a diskette that contains space or the VOLID of a disk volume that Create Index File can use for INDEX.WORKXX. Create Index File uses this work file to process and sort the record keys without disturbing the master file. After INDEX completes, the work file is freed.

Work file drive number. Enter the number of the drive that will contain the work file.

Displaying/printing messages, information, duplicate keys (screen 04-092)

Create Index File

04-092

Information and messages to:

- 1-Screen only
 - 2-Screen and printer
 - 3-Printer only
- 2

Printer number

- 10-First printer
 - 11-Second printer
- 10

Required when
printer used

List duplicate keys

- Y-Display and/or print duplicate keys
 - N-Do not list duplicate keys
- Y

Cmd 9 Cancel
? Help

This screen allows you to specify how you want any message output handled while you are running INDEX.

INDEX

Screens (continued)

Information and messages to. Select 1 if you want statistics, completion screens, and the duplicate keys list to be displayed on the screen. Select 2 to both display this information on the screen and print it on the printer. Select 3 to only print this information. If you select 2 or 3, your system must have a printer attached. If it does not, an error occurs.

Printer number. If you entered 2 or 3 above, select the printer to be used.

List duplicate keys. Enter Y to see the duplicate keys found after INDEX has completed. This data is displayed and/or printed based on your answers to the above prompts. Enter N if you do not want to see the duplicate keys list.

Note: Your answer to this prompt does not depend on whether or not you want duplicate keys included in the index file (see screen 04-062). Even if you do not want duplicate keys in the file, INDEX may find some. If it does, you may want to review them.

Completion and statistics (screens 04-112 and 04-122)

Create Index File

04-112

Statistics:

Master records read	200
Keys written	199
Duplicate key strings	10
Duplicate keys	199

These two screens tell you whether or not duplicate keys were found and give statistics on the processing performed. If the index file was created, screen 04-112 appears exactly as shown here.

If you did not want duplicate keys in the index file but duplicates were found, an index file is not created and screen 04-122 appears. It looks like screen 04-112 except that it says "Duplicate keys found but not desired."

The statistics given are:

- *Master records read* is the number of records in the master file, including deleted records. The deleted records are read but are not used to create the index file.
- *Keys written* is the number of entries placed in the index file. Duplicate keys are included in this number. If you did not want duplicate keys but INDEX found duplicates, the value for keys written is 0.

INDEX

Screens (continued)

- *Duplicate key strings* is the number of unique character strings that have more than one entry in the index file.
- *Duplicate keys* is the total number of duplicate keys. For each duplicate key string, there are at least two duplicate keys.

The statistics for duplicate key strings and duplicate keys are related. Assume that an index file with these keys was created:

A	A	B	B	C	D	E	E	E
---	---	---	---	---	---	---	---	---

A, B, and E are character strings that have more than one entry in the index file. Therefore, 3 is displayed as the number of duplicate key strings.

A has one duplicate, B has one duplicate, and E has two duplicates. Therefore, 7 is displayed as the number of duplicate keys.

Duplicate keys list (screen 04-132)

Create Index File

04-132

Duplicate keys	Relative record
ab0defghij	2
ab0defghij	12
ab0defghij	22
ab0defghij	32
ab0defghij	42
ab0defghij	52
ab0defghij	62
ab0defghij	72
ab0defghij	82
ab0defghij	92
ab0defghij	102
ab0defghij	112

This screen appears only if duplicate keys were encountered and you responded Y (yes) to list duplicate keys and selected the screen for displaying information and messages (on screen 04-092).

This screen lists all the duplicate keys in the index file along with their relative record numbers. A blank in the duplicate keys column means that the character in that position cannot be displayed or printed.

This information is scrolled on the screen. Up to 16 duplicate keys are displayed at one time. Press Enter to see the next 16. When you press Enter after the last duplicate key is displayed, one of the completion screens (04-142 or 04-152) appears.

INDEX

Screens (continued)

Procedure file (screen 04-169)

Create Index File Procedure File

04-169

CHOICE	IDXFILE	WRKVOLID
MASFILE	IDXVOLID	WRKDRVNO
MASVOLID	IDXDRVNO	MESSAGES
MASDRVNO	DUPKEY	2
KEYLGTH	N	PRINTER
KEYSTART	REPLIDXFILE	10
	N	LISTDUPKEYS
	IDXFILSIZE	Y

Cmd 9 Cancel

This screen appears only if MODE=A and:

- DISPLAY=Y is included in your procedure file, or
- a keyword in the procedure file contains an error, or
- a required keyword is missing.

The table that follows explains the keywords shown on the screen. You can use this table to correct a keyword error or to write a procedure to use INDEX.

Keyword	Values	Purpose	Notes	Refer to screen
*CHOICE	2	Indicates function is to create index file	2 is only valid value	04-010
*MASFILE=	Maximum of 17 characters	Name of master file		04-052
MASVOLID=	Maximum of 6 characters	Volume identification (VOLID) of master file	optional (must be specified when MASDRVNO=5)	04-052
MASDRVNO=	1,2,3,4, or 5	Indicates which drive holds the master file	optional	04-052
**IDXFILSIZE	1-999	Reserves contiguous file space in 1K byte increments	default to blank	None

* means keyword is required

** Use this keyword if you wish to reserve contiguous filespace in an amount other than would normally be allocated by INDEX.

Note: This keyword can only be used in a procedure.

Previous versions of INDEX do not support this keyword. A "7024" error (keyword is misspelled) will occur if you use this keyword and do not have the latest level of INDEX.

If INDEX requires more space than the IDXFILSIZE parameter specifies, then the IDXFILSIZE value specified will be overridden.

INDEX

Screens (continued)

Keyword	Values	Purpose	Notes	Refer to screen
*KEYLGTH=	01-28	Length of the record key		04-052
*KEYSTART=	Maximum is record length minus key field length plus 1	Position in master file record where record key begins		04-052
*IDXFILE=	Maximum of 17 characters	Name of index file		04-062
IDXVOLID=	Maximum of 6 characters	Volume identification (VOLID) of index file	Either IDXVOLID or IDXDRVNO must be included. (Both must be included when IDXDRVNO=5.)	04-062
IDXDRVNO=	1, 2, 3, 4, or 5	Indicates which drive holds the index file		04-062

* means keyword is required

Keyword	Values	Purpose	Notes	Refer to screen
DUPKEY=	Y or N	Y = Include duplicate keys in index file N = Do not include duplicate keys	If DUPKEY=N and INDEX finds duplicate keys, index file is not created. Default=N	04-062
REPLIDXFILE=	Y or N	Y = Replace contents of existing index file with file you are creating N = Do not destroy contents of existing index file	If REPLIDXFILE=N and index file already exists, error 7611 occurs. Default=N	04-072
WRKVOLID=	Maximum of 6 characters	Volume identification (VOLID) of the work file	Either WRKVOLID or WRKDRVNO must be included. (Both must be included when WRKDRVNO=5.)	04-082

INDEX

Screens (continued)

Keyword	Values	Purpose	Notes	Refer to screen
WRKDRVNO=	1, 2, 3, 4, or 5	Indicates which drive will hold the work file		04-082
MESSAGES=	1, 2, or 3	Indicates where messages go: 1=screen only 2=screen and printer 3=printer only	Default=2	04-092
PRINTER=	10 or 11	Indicates which printer: 10=first printer 11=second printer	Default=10	04-092
LISTDUPKEYS=	Y or N	Y = List duplicate keys found N = Do not list duplicate keys	List of duplicate keys is displayed and/or printed based on value for MESSAGES Default=y	04-092

Correcting an error. If the procedure file screen appears because of a keyword error that can be identified, the first in error is highlighted. Otherwise the CHOICE field is highlighted. You can change the keyword value in error and any other keyword value. However, the values in the procedure file are not changed. After you have made all changes, press Enter. The system then uses the values on the screen to run the procedure.

Procedure file example. The following example uses the minimum number of keywords to run INDEX from a procedure file.

```
LINK INDEX
CHOICE=2
MASFILE=MASTER
KEYLGTH=8
KEYSTART=1
IDXFILE=CUSTNO
IDXDRVNO=2
WRKDRVNO=2
ENDLINK
```

INDEX

Screens (continued)

An index file named CUSTNO is to be created from a master file named MASTER. The record key is 8 bytes long and begins in position 1 of the master file record. Diskette drive number 2 contains the diskette for both the work file and the index file.

Because keywords for the following have defaults and may not be included, the system assumes that:

- The mode is attended.
- The procedure file screen is displayed only if an error occurs.
- Messages are to go to the screen and printer.
- The first printer is to be used.
- If an index file named CUSTNO already exists, it is not to be destroyed.
- Duplicate keys are not to be included in the index file.
- Duplicate keys, if found, are to be listed on the screen and printer.

Chapter 5. COLSEQ

Introduction

Note: COLSEQ is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

The Change Collating Sequence Customer Support Function (COLSEQ) allows you to load or alter a collating sequence. It uses your answers to prompts to set up the desired collating sequence.

You can load the new sequence into the system so you can use it right away and save it on diskette or disk. If you save it, you can use the sequence any time you want by loading it.

A table showing the various collating sequences can be found in Appendix A.

What is a collating sequence?

A *collating sequence* is a specified order in which each character in the system is assigned a value. The system needs to know the value of characters when comparing and sorting data. The characters include:

- All letters (A through Z including uppercase, lowercase, and accented letters (such as "e in the name Andre"))
- All digits (0 through 9)
- Symbols such as punctuation marks, math symbols (such as = and >)) special symbols (such as @, \$ and #)

COLSEQ

Introduction (continued)

The value of a character is its position in the sequence. A simple collating sequence is shown here.

<i>Value</i>	<i>Character</i>
01	A
02	B
03	C
04	D
05	E
06	a
07	b
08	c
09	d
10	e

If this collating sequence were stored in your system, you could use COLSEQ to alter it. To alter a collating sequence means to change the values of the characters within it. The collating sequence shown before can be changed to:

Original sequence		Altered sequence		
Value	Character	Value	Character	
01	A	01	a	
02	B	02	A	
03	C	03	b	
04	D	04	B	Example 1
05	E	05	c	
06	a	06	C	
07	b	07	d,D	
08	c	08	e,E	Example 2
09	d			
10	e			

Example 1 shows the *reorder* function of COLSEQ; the order of six lowercase and uppercase letters (A, B, C, a, b, c) were changed. You can also assign the same value to more than one character in the sequence. This is the *equate* function.

Example 2 shows that the characters d and D are equal. They both have the value 07 in the altered sequence.

How a collating sequence is used

Your system uses a collating sequence when it is comparing and sorting data. The sequence is used to decide whether one piece of data is less than, equal to, or greater than another piece of data. The BASIC statement

```
IF LETTER$ < "B" THEN GOTO 130
```

compares the data in LETTER\$, a variable, to B, a constant. The system compares the collating sequence value of the data in LETTER\$ to the value of B.

Look at the collating sequences shown in the previous examples. If the original sequence is used, A is the only character for LETTER\$ that makes the statement true. The value of A (01) is less than the value of B (02). This is the only time the program branches to statement 130. If the altered sequence is used, the values of a, A, and b are less than B. In this case there are three pieces of data for LETTER\$ that cause the program to branch.

The collating sequence does not affect how a character is stored in the computer or how it is shown on the display. It defines only the order of the characters in relation to each other.

COLSEQ

Collating sequences

Native collating sequence

The standard EBCDIC sequence is the native collating sequence on your System/23. It consists of all the characters defined in the System/23. The native sequence contains all of the EBCDIC characters as well as accented versions of lowercase and uppercase letters. Some of the accents included are:

á ã ä â Ä Ä À Á Ã Ä

You might want to look at Appendix A in this book to see the order of the characters in the various collating sequences available.

If you do not load another sequence, the system uses the native sequence to compare and sort data. The native collating sequence is *a/ways* used to create an index file. The INDEX chapter describes index files.

Alternate collating sequences

In addition to the native sequence, there are six other collating sequences on your System/23. These other sequences are called *alternate collating sequences*.

The term *folding* is often used in describing these sequences. To fold means to set two or more characters (which are usually related) equal to the same value. For example, a could be folded to A. This means that a *and* A would be set equal to the same value in the sequence, namely that of A. *No folding* means that each character has a unique value in the sequence. No two characters have the same value.

The alternate collating sequences on your System/23 are briefly described here.

- **International sequence with no folding.** Each character has a unique value in the this sequence. Each lowercase letter comes immediately before its uppercase counterpart, followed by accented versions of the letter. For most languages, this sequence is widely accepted. Example:

a A à À â Â

- **International sequence with lowercase folded.** Each lowercase letter is folded to (set equal to the value of) its uppercase counterpart. Example: a is folded to A and they both have the value 02 in the sequence.

COLSEQ

Collating sequences (continued)

- **International sequence with lowercase and accented letters folded.** All lowercase and accented versions of each letter are folded to the unaccented uppercase letter. For example, the following accented characters are folded to the value of A in the sequence.

â ä Â Ä

- **ASCII.** This collating sequence contains the 128 ASCII characters. The other 128 characters in your System/23 such as accented letters, are put in the same order as in the native sequence. If you are using your System/23 to communicate with an ASCII system, this sequence may be useful to you.
- **5110/5120.** This sequence defines the order of 5110/5120 characters that have counterparts on the System/23 system. The 5110 and 5120 are other small IBM systems. If you have used one of these systems, you may want to use this collating sequence. The other System/23 characters (not found on the 5110/5120) are put in the same order as in the native sequence.

Using an alternate sequence

To use an alternate sequence, it must first be loaded into storage. You can load an alternate sequence by selecting that option from the option menu. You can also run this option from a procedure file. (The "load alternate collating sequence" option is the only COLSEQ option that can be run from a procedure file.)

After an alternate sequence is loaded, it remains ready for use until the system is switched off or until you use COLSEQ to load another sequence.

After COLSEQ loads an alternate sequence, you must tell the system when you want to use it. If you do not, the system will use the native collating sequence. To tell a BASIC program to use an alternate sequence, include this statement:

```
10 OPTION COLLATE ALTERNATE
```

For more details, see the OPTION statement in the *BASIC Language Reference*. The alternate sequence must be loaded before the program processes the OPTION statement.

To tell the sort program to use an alternate sequence, include "A" (for alternate collating sequence) in the File statement. For more details, see "File statement" in the SORT and PRESORT chapter.

COLSEQ

Functions of COLSEQ

COLSEQ can be used to do four things:

- Replace a collating sequence.
- Alter a collating sequence.
- Save a collating sequence on diskette or disk.
- Load a collating sequence.

COLSEQ lets you replace the storage-resident collating sequence that will be used in compare and sort operations.

You can alter a collating sequence by:

- Changing the order of characters in it.
- Assigning the same value to more than one character.

After you have entered the changes you want, you can review the altered sequence by displaying and/or printing it (if your system has a printer). If you want, you can then make more changes.

After altering a sequence, you can load it for use in the system right away and save it on diskette or disk. When you save a collating sequence, COLSEQ writes it to a file named ALTSEQXX. The XX is a "work station ID." Once you save a collating sequence in ALTSEQXX, you can load it by running option 4 of COLSEQ. Loading a collating sequence can be done by running COLSEQ option 4 from a procedure file.

Running COLSEQ

When to use COLSEQ

Use COLSEQ only if you have special needs for an alternate or altered collating sequence. You may, for example, need to:

- Ensure compatibility with another system. If your System/23 is part of a network that uses the ASCII instead of EBCDIC character set, you might want to use the ASCII collating sequence.
- Meet special sort output requirements. To create an index for a book, you might want the order of the entries to be strictly alphabetical, ignoring uppercase and lowercase letters and accents. (You could also use PRESORT to alter the sequence for a given sort. However, if you use PRESORT, you can use the sequence only for a given sort. You cannot save it on diskette or disk and use it whenever you want.)
- Reflect sequencing standards or conventions that are unique to a language.

Before you begin

If you plan to save a sequence in or to load one from an ALTSEQXX file, you need the diskette for ALTSEQXX. The size of the ALTSEQXX file is 512 bytes. It can contain only one sequence.

If you plan to alter a collating sequence, you should have Appendix A on hand. Appendix A is a Collating Sequence Table that shows values of all of the characters in the Native and alternate collating sequences.

COLSEQ

Running COLSEQ (continued)

You can use a procedure file to load the collating sequence saved in ALTSEQXX. If you are using diskettes, you may want to put COLSEQ, ALTSEQXX, and the procedure file on the same diskette. For details on how to use a procedure file to load a collating sequence, see "Procedure file (screen 09-199)" on page 5-39.

Operating considerations

- When you are altering a collating sequence (see screen 09-133 in this chapter), you may want to change the collating sequence value of a character that is not on the keyboard. To do this, you use the Alt key. This key is used to enter and display any character in the native collating sequence.
- To enter a character that is not on the keyboard, you need to know its decimal value in the native collating sequence. Use Appendix A to look up the value. Hold down the Alt key while you enter the three-digit decimal value of the character, and then press Enter. The character is then displayed. Note that the three-digit number you enter is *not* displayed.
- When you want to stop processing and go back to the option menu, press and hold the Cmd key and press the 9 on the numeric keypad (at the right side of the keyboard.)

Examples of using COLSEQ

To help you understand how to use COLSEQ, a two-part example is shown here.

In the first part, we are going to alter the EBCDIC collating sequence and save it in the ALTSEQXX file.

The collating sequence is being changed to do sorts that will sort the numeric characters ahead of the alpha characters. To do this, 0-9 will be given a lower value in the collating sequence.

To see what the collating sequence looks like before the change, look at the following screen. The row highlighted in the box is what we want to change.

```
000 001 002 003 004 005 006 007 008 009 010 011      09-203
012 013 014 015 016 017 018 019 020 021 022 023
024 025 026 027 028 029 030 031 032 033 034 035
036 037 038 039 040 041 042 043 044 045 046 047
048 049 050 051 052 053 054 055 056 057 058 059
060 061 062 063 064 065 A066 A067 A068 A069 A070 A071
C072 A073 I074 .075 <076 I077 +078 '079 S080 A081 A082 A083
A084 I085 I086 I087 I088 B089 I090 *091 *092 I093 .094 ^095
-096 /097 A098 A099 A100 A101 A102 A103 C104 A105 I106 .107
X108 109 >110 ?111 a112 f113 f114 f115 f116 i117 I118 I119
I120 `121 i122 *123 @124 '125 =126 "127 #128 a129 b130 c131
d132 e133 f134 g135 h136 i137 j138 k139 l140 y141 r142 s143
^144 i145 k146 l147 m148 n149 o150 p151 q152 r153 *154 *155
#156 .157 f158 w159 u160 ~161 e162 f163 u164 v165 w166 x167
v168 z169 I170 <171 B172 Y173 J174 @175 C176 f177 Y178 R179
Y180 f181 Y182 X183 X184 X185 ^186 I187 ^188 ^189 ^190 ^191
I192 A193 B194 C195 D196 E197 F198 G199 H200 I201 ^202 A203
A204 A205 A206 A207 I208 J209 K210 L211 M212 N213 O214 P215
Q216 R217 I218 O219 O220 O221 O222 Y223 \224 225 S226 T227
U228 V229 W230 X231 Y232 Z233 *234 A235 A236 A237 A238 A239
0 240 1 241 2 242 3 243 4 244 5 245 6 246 7 247 8 248 9 249
*250 0251 0252 0253 0254 255
```

Press Enter to continue Cmd 9 Cancel

COLSEQ

Examples of using COLSEQ (continued)

On the collating sequence screen are groups of three or four characters.

The first character in each group is either a blank (if a character is unprintable) or a printable EBCDIC character. The next three digits show the value in the collating sequence. For readability, numbers appear with a space between the number and three digit value.

Note: COLSEQ is on diskette VOL002.

The first part of the example shows what you have to do to change the collating sequence. (After the collating sequence is changed, we will look at the altered sequence to see that it was changed.)

In the second part of the example, we will load the altered collating sequence.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

You will need the COLSEQ Customer Support Function. You will also need a disk volume or diskette to save the altered collating sequence on.

To start COLSEQ:

1. Insert the Customer Support Functions diskette into a diskette drive.
2. Enter: LINK COLSEQ

After you press Enter, the following menu is displayed. Select 3 and press Enter.

Change Collating Sequence Menu

09-010

Choose one of the following:

1. Description of Change Collating Sequence
2. Replace collating sequence
3. Alter collating sequence
4. Load alternate collating sequence

9. End Change Collating Sequence

Choice

3

COLSEQ

Examples of using COLSEQ (continued)

The next screen asks if you want your completion screens and messages displayed only, printed and displayed, or printed only. It also asks which printer you want, if you want to use the printer. Select 2 or 3 and press Enter.

Alter Collating Sequence

09-113

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only

1

Printer number

- 10-First printer
- 11-Second printer

10

Required when
Printer used

The next screen asks which collating sequence you want to alter. Select 6 and press Enter.

Alter Collating Sequence

09-123

Choose one of the following:

1. International Fold Lower Case
2. International Fold Diacritical
3. International Fold Diacritical and Lower Case
4. ASCII
5. 5110/5120
6. EBCDIC
7. Current Ram-Resident

9. Return to main menu

Choice

-

COLSEQ

Examples of using COLSEQ (continued)

The next screen asks how you want to alter the sequence. It also asks if you want to display, display and print, or print the altered sequence.

For "Method. . .," enter RO (to reorder the sequence).

For "Value," enter 10. (This is an arbitrary value lower than the value assigned to A-F and a-f.) This causes 0 to be given the value 010, 1 given 011, etc.

For "Characters," enter the numbers 0123456789.

Enter 1 for "Provide altered..." to display the altered sequence. Press Enter.

Alter Collating Sequence

09-133

Method for altering sequences	Required
RO-Reorder sequence	
EQ-Equate values	
<u>RO</u>	
Value	Required
<u>10</u>	
Characters	Required
<u>"0123456789"</u>	Enclosed in quotes
Provide altered sequence on:	
1-Screen only	
2-Screen and printer	
3-Printer only	
4-Bypass the review	
<u>1</u>	
Printer number	Required when Printer used
10-First printer	
11-Second printer	
<u>10</u>	

Cmd 9 Cancel
? Help

To continue, leave first input field blank and press Enter.

The next screen shows the EBCDIC collating sequence after it is altered.

09-203

000	001	002	003	004	005	006	007	008	009	010	011
012	013	014	015	016	017	018	019	020	021	022	023
024	025	026	027	028	029	030	031	032	033	034	035
036	037	038	039	040	041	042	043	044	045	046	047
048	049	050	051	052	053	054	055	056	057	058	059
060	061	062	063	064	065	066	067	068	069	070	071
072	073	074	075	076	077	078	079	080	081	082	083
084	085	086	087	088	089	090	091	092	093	094	095
096	097	098	099	100	101	102	103	104	105	106	107
108	109	110	111	112	113	114	115	116	117	118	119
120	121	122	123	124	125	126	127	128	129	130	131
132	133	134	135	136	137	138	139	140	141	142	143
144	145	146	147	148	149	150	151	152	153	154	155
156	157	158	159	160	161	162	163	164	165	166	167
168	169	170	171	172	173	174	175	176	177	178	179
180	181	182	183	184	185	186	187	188	189	190	191
192	193	194	195	196	197	198	199	200	201	202	203
204	205	206	207	208	209	210	211	212	213	214	215
216	217	218	219	220	221	222	223	224	225	226	227
228	229	230	231	232	233	234	235	236	237	238	239
0	010	1	011	2	012	3	013	4	014	5	015
6	016	7	017	8	018	9	019	250	0251	0252	0253
0254	255										

Press Enter to continue

Cmd 9 Cancel

Note that the values for 0-9 have been changed.

COLSEQ

Examples of using COLSEQ (continued)

After you press Enter, screen 09-133 is redisplayed. Note that the "Value" field now shows 020. That is because you have just assigned values 10-19 to the characters 0-9. If you had more changes you would enter them. To continue to the next screen just leave the first field blank and press Enter.

Alter Collating Sequence

09-133

Method for altering sequences
RO-Reorder sequence
EQ-Equate values

Required

Value
020

Required

Characters
" " _____

Required
Enclosed in
quotes

Provide altered sequence on:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only
- 4-Bypass the review
- 1

Printer number
10-First printer
11-Second printer
10

Required when
Printer used

Cmd 9 Cancel
? Help

To continue, leave first input field blank and press Enter.

The next screen asks if you want to save the altered sequence or just replace it in the computer. You want to do both. Type Y and press Enter.

Alter Collating Sequence

09-143

Save the collating sequence on diskette or disk

Y-Save the collating sequence in file ALTSEQ

N-Do not save

Y

Replace the collating sequence in the computer

Y-Replace the collating sequence now

N-Do not replace

Y

The next screen asks information about where you want the altered sequence saved. Type 2 and press Enter. (Make sure your diskette is in drive 2.)

Alter Collating Sequence

09-153

Drive number

2

Optional when
VOLID provided

VOLID

Required when
Drive number is 5

COLSEQ

Examples of using COLSEQ (continued)

Press Enter and the completion screen is displayed.

Alter Collating Sequence

09-183

Change Collating Sequence was successful.

The altered collating sequence is now on the diskette in drive 2. It is also in the computer. Press Enter and the menu is redisplayed.

For the second part of the example, assume that at a later date you want to use the altered collating sequence. You start COLSEQ as you did at the beginning of this example. When the option menu is displayed, type 4 and press Enter.

Change Collating Sequence Menu

09-010

Choose one of the following:

1. Description of Change Collating Sequence
2. Replace collating sequence
3. Alter collating sequence
4. Load alternate collating sequence

9. End Change Collating Sequence

Choice

4

COLSEQ

Examples of using COLSEQ (continued)

The next screen asks if you want your completion screens and messages displayed only, printed and displayed, or printed only. It also asks which printer you want, if you want to use the printer. Select 2 or 3 and press Enter.

Load Collating Sequence

09-114

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only

1

Printer number
10-First printer
11-Second printer
10

Required when
Printer used

The next screen asks information about where the altered collating sequence is to be loaded from. Type 2 for Drive number and press Enter.

Load Collating Sequence

09-154

Drive number
2

Optional when
VOLID provided

VOLID

Required when
Drive number is 5

Cmd 9 Cancel
? Help

COLSEQ

Examples of using COLSEQ (continued)

The next screen indicates the collating sequence was successfully loaded.

Load Collating Sequence

09-184

Change Collating Sequence was successful.

After you press Enter the option menu is redisplayed.

COLSEQ screens

This section contains the screens that can appear while you are running COLSEQ. They are shown in numeric order by screen number, starting with the lowest screen number, so that you can quickly find the screen you want.

The order of screens in this section may not be the order in which they appear while you are running COLSEQ. The order depends on the option you select on the menu and your answers to certain prompts.

The title and number of many screens also depend upon the option you select on the menu. For screens on which this information varies, the heading above the screen shows more than one screen number. Completion screens and in-progress screens are not included in the section.

COLSEQ

COLSEQ screens (continued)

Menu (screen 09-010)

Change Collating Sequence Menu

09-010

Choose one of the following:

1. Description of Change Collating Sequence
2. Replace collating sequence
3. Alter collating sequence
4. Load alternate collating sequence

9. End Change Collating Sequence

Choice

-

Select 1 to see five screens (09-021 through 09-061) that describe COLSEQ. After screen 09-061 is displayed, the program returns to this menu.

Select 2 to replace the collating sequence that is currently in storage with one of the six available sequences. You can also save this sequence on diskette or disk.

Select 3 to alter a collating sequence. To alter means to change the order of characters in the sequence or to set more than one character equal to the same value.

Select 4 to load the collating sequence saved in the ALTSEQXX file. After it is loaded, you can use this sequence until you switch off your System/23. This is the only option that can be run from a procedure file.

Select 9 to end COLSEQ. The system then returns to READY INPUT status.

COLSEQ

COLSEQ screens (continued)

Information and Messages (screens 09-112, 09-113, and 09-114)

Replace Collating Sequence

09-112

Information and messages to:

- 1-Screen only
 - 2-Screen and printer
 - 3-Printer only
- 2

Printer number
10-First printer
11-Second printer

10

Required when
Printer used

This screen allows you to display and/or print any information messages while you are running COLSEQ.

Information and messages to. Select 1 if you want completion screens and messages to be displayed on the screen. Select 2 to both display this information on the screen and print it on the printer. Select 3 to only print this information. If you select 2 or 3, your system must have a printer attached. If it does not, an error occurs.

Printer number. If you entered 2 or 3 above, select the printer to be used. If you do not type any number, the system will use 10.

Collating sequences (screens 09-122 and 09-123)

Replace Collating Sequence

09-122

Choose one of the following:

1. International Fold Lower Case
2. International Fold Diacritical
3. International Fold Diacritical and Lower Case
4. ASCII
5. 5110/5120
6. EBCDIC
7. Current Ram-Resident

9. Return to main menu

Choice

This screen appears only if you selected option 2 or 3 (replace or alter collating sequence) on the menu.

Enter the number of the collating sequence you want to alter or replace. Valid entries are 1-7.

The collating sequences are briefly described under "Collating sequences" on page 5-4. The complete sequences are given in Appendix A.

COLSEQ

COLSEQ screens (continued)

Altering a sequence (screen 09-133)

Alter Collating Sequence

09-133

Method for altering sequences
RO-Reorder sequence
EQ-Equate values

Required

Value

Required

Characters

Required
Enclosed in
quotes

Provide altered sequence on:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only
- 4-Bypass the review

4

Printer number
10-First printer
11-Second printer

Required when
Printer used

10

Cmd 9 Cancel
? Help

To continue, leave first input field blank and press Enter.

This screen appears only if you selected option 3, Alter collating sequence, on the menu.

Method for altering sequence. Enter RO to reorder the sequence of characters or EQ to set characters equal to a collating value. An example of using RO is: instead of A B C D E F followed later by a b c d e f, change the sequence to A a B b C c D d E e F f. An example of using EQ is to set the collating value of the digits 1 through 9 equal to the collating value of 0.

Value. If you entered RO above, enter the collating sequence value, in decimal, for the first character to be reordered. If you entered EQ above, enter the collating sequence value for the characters you want to set equal to that value. Valid entries for the value are 0-255.

Characters. If you entered RO above, enter the characters that are to be reordered, beginning with the value you entered above. If you entered EQ above, enter the characters that are to be given the value you entered above.

Valid entries are all characters in your system. Remember, when you are entering alphabetic characters that uppercase and lowercase have different values.

To enter a character that is not on the keyboard, see "Operating considerations" on page 5-10. Enclose the characters you enter in quotation marks. You can enter up to 30 characters each time this screen is displayed. The quotation marks do not count toward the 30-character limit.

COLSEQ

COLSEQ screens (continued)

Some samples of entries for the three fields follow.

If you enter:

RO
30
"AaBbCcDdEeFf"

the collating sequence is reordered as follows.

Value	Character
030	A
031	a
032	B
033	b
034	C
035	c
036	D
037	d
038	E
039	e
040	F
041	f

If you enter:

EQ
86
"123456789"

the digits 1 through 9 are set equal to the value 86 in the sequence.

Provide altered sequence on. Select 1 to review, on the screen, the altered collating sequence, including all changes you have made so far. Select 2 to both display the sequence and print it on the printer. Select 3 to only print it. Select 4 if you do not want to review the sequence.

If you select 2 or 3, your System/23 must have a printer attached. If it does not, an error occurs.

Printer number. If you entered 2 or 3 above, select the printer to be used.

After you press Enter, this prompt is displayed again. If you want to reorder or equate more characters, respond to the prompts again. To end input, leave the first input field blank and press Enter.

COLSEQ

COLSEQ screens (continued)

Saving and replacing a sequence (screens 09-142 and 09-143)

Replace Collating Sequence

09-142

Save the collating sequence on diskette or disk

Y-Save the collating sequence in file ALTSEQ

N-Do not save

N

Replace the collating sequence in the computer

Y-Replace the collating sequence now

N-Do not replace

Y

This screen appears only if you selected option 2 or 3 (replace or alter collating sequence) on the menu.

Save the collating sequence. Enter Y to save the collating sequence on a diskette or the disk. Enter N if you do not want to save it. A collating sequence that is saved is always written to a file named ALTSEQXX where XX is the work station ID. This file can contain only one collating sequence.

Replace the collating sequence in the computer. Enter Y to load into storage the sequence you have been working with. If you do this, the collating sequence you load can be used until your system is turned off. Enter N if you do not want to replace the current collating sequence.

Note: Even if you enter N to not save or replace the sequence, a successful completion screen will be displayed.

ALTSEQXX file (screens 09-152, 09-153, and 09-154)

Replace Collating Sequence

09-152

Drive number

Optional when
VOLID provided

-

VOLID

Required when
Drive number is 5

This screen appears if you selected option 4, load alternate collating sequence, on the menu or if you answered Y (yes) to save the collating sequence (screens 09-142 and 09-143).

Drive number. Enter the number of the drive that contains the ALTSEQXX file to be loaded or on which the ALTSEQXX file is to be saved.

VOLID. Enter the VOLID of the disk volume or diskette that holds the ALTSEQXX file to be loaded or on which the ALTSEQXX file is to be saved.

COLSEQ

COLSEQ screens (continued)

**ALTSEQXX file already exists (screens 09-162, 09-163,
and 09-164)**

Replace Collating Sequence

09-162

WARNING: An alternate collating sequence
already exists on the diskette or disk.

Replace existing collating sequence
Y-Replace the collating sequence now
N-Do not replace
Y

Cmd 9 Cancel
? Help

This screen appears only if the ALTSEQXX file already exists on the disk volume or diskette you identified on the preceding screen.

Enter Y to write the collating sequence you have been working with to the ALTSEQXX file. The sequence that now exists in ALTSEQXX will be destroyed.

Enter N if you do not want to destroy the collating sequence that is now saved in ALTSEQXX. Even though the existing sequence is not replaced, a successful completion screen will be displayed.

A disk volume or diskette can contain more than one ALTSEQXX file only if each work station ID (XX) is unique. A disk volume or diskette cannot contain two files with the same name.

Review of altered sequence (screen 09-203)

000	001	002	003	004	005	006	007	008	009	010	011		09-203
012	013	014	015	016	017	018	019	020	021	022	023		
024	025	026	027	028	029	030	031	032	033	034	035		
036	037	038	039	040	041	042	043	044	045	046	047		
048	049	050	051	052	053	054	055	056	057	058	059		
060	061	062	063	064	065	066	067	068	069	070	071		
072	073	074	075	076	077	078	079	080	081	082	083		
084	085	086	087	088	089	090	091	092	093	094	095		
096	097	098	099	100	101	102	103	104	105	106	107		
108	109	110	111	112	113	114	115	116	117	118	119		
120	121	122	123	124	125	126	127	128	129	130	131		
132	133	134	135	136	137	138	139	140	141	142	143		
144	145	146	147	148	149	150	151	152	153	154	155		
156	157	158	159	160	161	162	163	164	165	166	167		
168	169	170	171	172	173	174	175	176	177	178	179		
180	181	182	183	184	185	186	187	188	189	190	191		
192	193	194	195	196	197	198	199	200	201	202	203		
204	205	206	207	208	209	210	211	212	213	214	215		
216	217	218	219	220	221	222	223	224	225	226	227		
228	229	230	231	232	233	234	235	236	237	238	239		
240	241	242	243	244	245	246	247	248	249	250	251		
252	253	254	255										

Press Enter to continue

Cmd 9 Cancel

This screen appears only if you selected to review the altered sequence on the display (see screen 09-133).

It shows the native collating sequence as a matrix. In each row there are groups of three or four characters. The last three digits are the value in the sequence. The first character is a blank, if unprintable, or a printable character.

The first row shows, from left to right, the decimal values of the first 12 characters in the sequence. The second row shows the decimal values of the next 12 characters in the sequence, and so on for the other rows.

COLSEQ

COLSEQ screens (continued)

This particular screen shows the EBCDIC collating sequence. To find the value for a given character, find the character on the screen and it is followed by a 3-character value. For example, the % sign (on the tenth row) has a value of 108. Refer to Appendix A for more information about values of characters in various collating sequences.

If you requested (on screen 09-133) that the altered sequence be printed on the printer, you will see two extra lines of data after the screen data. This is just another representation of what is on the screen.

Procedure file (screen 09-199)

Change Collating Sequence Procedure File

09-199

CHOICE

4

MESSAGES

2

PRINTER

10

INDRVNO

-

INVALID

Cmd 9 Cancel

This screen appears only if MODE=A and:

- DISPLAY=Y is included in your procedure file, or
- A keyword and/or parameter in the procedure file contains an error, or
- A required keyword is missing

The table that follows explains the keywords shown on the screen. You can use this table to correct an error or to write a procedure to run COLSEQ option 4 from a procedure file.

COLSEQ

COLSEQ screens (continued)

Keyword	Values	Purpose	Notes	Refer to screens
CHOICE=	4	Indicates function is to load collating sequence from ALTSEQXX file	4 is only valid value	09-010
MESSAGES=	1, 2 or 3	Indicates where messages go: 1=screen only 2=screen and printer 3=printer only	If this statement is not used, messages are displayed and printed	09-112 09-113 09-114
PRINTER=	10 or 11	Indicates which printer: 10=first printer 11=second printer		09-112 09-113 09-114
INDRVNO=	1, 2, 3, 4 or 5	Indicates which drive contains the ALTSEQXX file	Either INDRVNO or INVOLID must be included	09-152 09-153 09-154
INVOLID=	Maximum of 6 characters	Volume identification of ALTSEQXX file	Must be specified when INDRVNO=5	09-152 09-153 09-154

Correcting an error. If this screen appears because of a keyword error that the system can identify, the field in error is highlighted. Otherwise CHOICE is highlighted. You can change the keyword in error and any other keyword.

However, the values in the procedure file are not changed. After you have entered all changes, press Enter. The system then uses the values on the screen to run the procedure.

Using COLSEQ from a procedure file. The only function of COLSEQ that can be run from a procedure file is the load function. If you want to alter or save a collating sequence, you must enter LINK COLSEQ from the keyboard.

COLSEQ

COLSEQ screens (continued)

LINK COLSEQ in the procedure file loads the program into the system. The example here shows all the keywords that can be included in the procedure file.

```
LINK COLSEQ
MODE=U
DISPLAY=N
CHOICE=4
MESSAGES=3
PRINTER=10
INDRVNO=1
INVALID=IBMIRD
ENDLINK
```

The mode is unattended and messages are to be printed.; The system must have the system printer attached. The diskette that contains the ALTSEQXX file is inserted in drive 1, and its VOLID is IBMIRD.

Chapter 6. LISTFILE

Introduction

Note: LISTFILE is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

The List File (LISTFILE) Customer Support Function lets you investigate the records in a file. It uses your answers to prompts to list your records and summary information about the records.

If you use index files with your records, this program can help point out inconsistencies between your index keys and their associated records. This is the major advantage and use of LISTFILE.

For example, LISTFILE will identify the following errors:

- A valid index key is found, but the associated record is deleted.
- A valid index key is found, but the associated record does not exist.
- A deleted index key is found, but the associated record is valid.
- A deleted index key is found, but the associated record does not exist.
- The index key does not match the index key field within the record.

You should run this program when your IBM representative directs you to run LISTFILE. However, you may also run this program any time that a System/23 data file needs to be examined.

You should also run LISTFILE after you run DISK.RECOVER for a disk file that you accidentally freed. LISTFILE can help you find out what information is missing. See "Example 3. Listing a disk file sequentially" on page 6-23.

LISTFILE

Functions of LISTFILE

LISTFILE can be used to list the records in a file. If you wish, you can ask for a listing of each of the following:

- All records
- All index keys and their associated records
- Specific records
- Specific index keys and their associated records

When you request a listing, you can ask for the following:

- The records are to be listed on the screen only, on the printer only, or on both the screen and printer.
- The listing is to include summary information about the records only, or both the records and summary information about the records.
- The listing is to include graphic representation of the records only, or both internal and graphic representation.
- Deleted records are to be included in the listing or ignored.
- The records past the end-of-data marker are to be listed or only the current records are to be listed. If the entire file area is listed, then all the records, including those between the end-of-data marker and the end-of-file marker, are listed.

Running LISTFILE

Note: LISTFILE is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

Before you begin

You need these items before you start LISTFILE:

- The LISTFILE Customer Support Function
- The diskette or the VOLID of the disk volume that contains your file to be listed
- The diskette or the VOLID of the disk volume that contains your index files

Operating considerations

As you type your choices for the file to be listed, the values you type are saved by LISTFILE. In this way, if you wish to list another file using the same choices, you can rapidly go through the option screens by pressing Enter for each screen.

Once a list is started:

- You can stop the list at any time by using the HOLD key.
- You can end the list by pressing the Cmd and ATTN keys, and then pressing the Cmd and Error Reset keys.

If you ask for only summary information about the records, the program will run faster.

The quickest way to find any inconsistencies between your file and the index file is to ask for only summary information. Any inconsistencies will show on the summary screen.

LISTFILE

Running LISTFILE (continued)

When you run "List File by Index Keys," your summary information includes the following fields: total keys, deleted keys, and overflow keys. When you run "List Records by Index Keys," these fields are not included in your summary since the entire index file is not read.

Examples using LISTFILE

Note: LISTFILE is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

Three examples follow. The first example asks that records be obtained in order. The second example asks that the records be obtained by using keys in an index file. The third example lists in order the files in a disk volume.

Example 1. Listing a file sequentially

Suppose you have a file named MASTER.DEL. You want to get a listing in order of all the records in the file.

1. Insert the Customer Support Functions diskette into a diskette drive.
2. Type: LINK LISTFILE
3. Press: Enter key

LISTFILE

Examples using LISTFILE (continued)

You will see the List File Menu screen. Choose 2, as indicated, to get the sequential list.

List File Menu

13-010

Choose one of the following:

1. Description of List File
2. List file sequentially
3. List file by index keys
4. List records sequentially
5. List records by index keys

9. End List File

Choice
2

Press the Enter key.

The next screen asks where the information is to be shown. Since you want the information to be shown on the screen only, choose 1 as indicated.

Note: Since the information will not be printed, the printer number is ignored.

List File Sequentially

13-022

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only
- 1

Printer number

- 10-First printer
- 11-Second printer
- 10

Required when
printer used

Cmd 9 Cancel
? Help

Press the Enter key.

LISTFILE

Examples using LISTFILE (continued)

The next screen asks for information about the records to be listed.

- For "List records," choose 1 to get both the records and summary information about the records.
- For "List internal representation," choose 2 to get only the graphic representation of the records.
- For "List deleted records," choose 1 to include deleted records in the list of records.
- For "Read all file area" choose 2 to include only the records up to the end-of-data marker.

```
List File Sequentially                                     13-032

List records                                             Required
  1-List summary and records
  2-List summary only
  1

List internal representation                             Required
  1-List internal representation
  2-List graphic only
  2

List deleted records                                    Required
  1-List deleted records
  2-Skip deleted records
  1

Read all file area                                     Required
  1-Read entire file area
  2-Read current data only
  2

Cmd 9 Cancel
? Help
```

Press the Enter key.

The next screen asks you to specify information about the files to be listed. Type MASTER.DEL as the name of the file, as indicated.

If you do not enter an input VOLID when your drive number is 5 (disk), the computer will list information for the first file it finds with the filename you specified. The computer starts the search from the *first* volume on your disk.

List File Sequentially	13-042
Input Filename <u>MASTER.DEL</u>	Required
Input VOLID _____	Optional
Input drive number -	Optional
	Cmd 9 Cancel ? Help

Press the Enter key.

LISTFILE

Examples using LISTFILE (continued)

The next screen shows the start of the listing. Notice that each record takes two lines to be displayed.

```
List File Sequentially                                     13-052
D-deleted          O-overflow key      P-past end of data
1.....10.....20.....30.....40.....50.....60

Line no. 1      Record no. 1
                abcdefghijklmnopqrstuvwxyzABC1EFGHIJKLMNOPQRSTUVWXYZ01234567
Line no. 2      B9abcdefghijklmnopqrstuvwxyzaBCDEFGHIJKLMNOPQRSTUVWXYZ012345

Line no. 1      Record no. 2
                abcdefghijklmnopqrstuvwxyzABC2EFGHIJKLMNOPQRSTUVWXYZ01234567
Line no. 2      B9abcdefghijklmnopqrstuvwxyzaBCDEFGHIJKLMNOPQRSTUVWXYZ012345

1.....10.....20.....30.....40.....50.....60
```

The next screen shows more of the listing. Notice that the letter D comes before record 92. This means that record 92 is deleted.

```
List File Sequentially                                     13-052
D-deleted          O-overflow key          P-past end of data
1.....10.....20.....30.....40.....50.....60
Record no. 90
Line no. 1         abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ01234567
Line no. 2         89abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMN0PQRSTUVWXYZ012345
Record no. 91
Line no. 1         abcdefghijklmnopqrstuvwxyzABC1EFGHIJKLMNOPQRSTUVWXYZ01234567
Line no. 2         89abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMN0PQRSTUVWXYZ012345
D
Record no. 92
Line no. 1         abcdefghijklmnopqrstuvwxyzABC2EFGHIJKLMNOPQRSTUVWXYZ01234567
Line no. 2         89abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMN0PQRSTUVWXYZ012345
Record no. 93
Line no. 1         abcdefghijklmnopqrstuvwxyzABC3EFGHIJKLMNOPQRSTUVWXYZ01234567
1.....10.....20.....30.....40.....50.....60
```


LISTFILE

Examples using LISTFILE (continued)

The next screen shows the end of the listing. You know that the listing is complete when "Press Enter to continue" is at the bottom of the screen.

```
List File Sequentially                                     13-052
D-deleted      0-overflow key      P-past end of data
1.....10.....20.....30.....40.....50.....60

Line no. 2      89abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZ012345
                Record no. 198
Line no. 1      abcdefghijklmnopqrstuvwxyABC8EFGHIJKLMNOPQRSTUVWXYZ01234567
Line no. 2      89abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZ012345
                Record no. 199
Line no. 1      abcdefghijklmnopqrstuvwxyABC9EFGHIJKLMNOPQRSTUVWXYZ01234567
Line no. 2      89abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZ012345
                Record no. 200
Line no. 1      abcdefghijklmnopqrstuvwxyABC0EFGHIJKLMNOPQRSTUVWXYZ01234567
Line no. 2      89abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZ012345

Press Enter to continue                                     Cmd 9 Cancel
1.....10.....20.....30.....40.....50.....60
```

Press the Enter key.

The next screen gives you the summary information you asked for. You can see that MASTER.DEL contains 200 records. In MASTER.DEL, 2 of the 200 records are deleted.

List File Sequentially

13-132

Summary Information

Input filename	- MASTER.DEL
File type	- 04
Date created	- 81/06/04
Last update	- 81/06/04
Record length	- 120
Total records	- 200
Records read	- 200
Deleted records	- 2

Press Enter to continue

Cmd 9 Cancel

Press the Enter key.

LISTFILE

Examples using LISTFILE (continued)

The next screen shows successful completion of LISTFILE.

List File Sequentially

13-072

List File successful.

Press Enter to return to menu

Note: LISTFILE is on
diskette VOL002

Note: If you have the
5247 Disk Unit, your
Customer Support
Functions are on your
disk. This means that
you will not have to
insert or remove a
Customer Support
Functions diskette.
Start with step 2.

Example 2. Listing a file by index keys

Suppose you have a file named MASTER.BAD and an index file named MASTER.NDX.DEL. You think there is a problem with the files.

You want to see if there are inconsistencies between the files.

1. Insert the Customer Support Functions diskette into a diskette drive.
2. Type: LINK LISTFILE
3. Press: Enter key

LISTFILE

Examples using LISTFILE (continued)

You will see the List File Menu screen. Choose 3, as indicated, to list the file by index keys.

List File Menu

13-010

Choose one of the following:

1. Description of List File
2. List file sequentially
3. List file by index keys
4. List records sequentially
5. List records by index keys

9. End List File

Choice

3

Press the Enter key.

The next screen asks where the information is to be shown. Since you want the information to be displayed on the screen only, choose 1 as indicated.

Note: Since the information will not be printed, the printer number is ignored.

List File by Index Keys

13-023

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only
- 1

Printer number

- 10-First printer
- 11-Second printer
- 10

Required when
printer used

Cmd 9 Cancel
? Help

Press the Enter key.

LISTFILE

Examples using LISTFILE (continued)

The next screen asks for information about the records to be listed.

- For "List records," choose 2 to get only the summary information about the records and keys.
- Since you chose 2 for "List Records" above, "List internal representation" and "List deleted records" are ignored.
- For "Read all file area," choose 2 to include only the records up to the end-of-data marker.

List File by Index Keys

13-033

List records Required

1-List summary and records

2-List summary only

2

List internal representation Required

1-List internal representation

2-List graphic only

2

List deleted records Required

1-List deleted records

2-Skip deleted records

1

Read all file area Required

1-Read entire file area

2-Read current data only

2

Cmd 9 Cancel

? Help

Press the Enter key.

The next screen asks you for information about the files to be listed. Type MASTER.BAD as the name of the file and MASTER.NDX.DEL as the name of the index file, as indicated.

If you do not enter an input VOLID when your drive number is 5 (disk), the computer will list information for the first file it finds with the filename you specified. The computer starts the search from the *first* volume on your disk.

List File by Index Keys

13-063

Input Filename <u>MASTER.BAD</u>	Required
Input VOLID _____	Optional
Input drive number -	Optional
Index Filename <u>MASTER.NDX.DEL</u>	Required
Index VOLID _____	Optional
Index drive number -	Optional

Cmd 9 Cancel
? Help

Press the Enter key.

LISTFILE

Examples using LISTFILE (continued)

The next screen is shown while the information is being processed.

List File by Index Keys

13-163

List File in progress

The next screen gives you the summary information you asked for.

In the summary, notice that the "Total records" does not match the "Total keys." Also, the "Deleted records" does not match the "Deleted keys." These inconsistencies show that the files are in error. You may now wish to repeat LISTFILE, choosing 1 (list summary and records) in screen 13-033 to find the specific inconsistencies.

List File by Index Keys

13-113

Summary Information

Input filename	- MASTER.BAD
File type	- 04
Date created	- 81/06/04
Last update	- 81/06/04
Record length	- 120
Total records	- 1
Records read	- 1
Deleted records	- 0
Index filename	- MASTER.NDX.DEL
Date created	- 81/06/04
Last update	- 81/06/04
Position of key	- 30
Length of key	- 1
Total keys	- 200
Deleted keys	- 2
Overflow keys	- 0

Press Enter to continue

Cmd 9 Cancel

Press the Enter key.

LISTFILE

Examples using LISTFILE (continued)

The next screen shows you that error conditions have caused the listing to be unsuccessful.

List File by Index Keys

13-083

List File unsuccessful.

Press Error Reset and then press Enter to return to menu

Example 3. Listing a disk file sequentially

Suppose you ran DISK.RECOVER to recover a freed file. You returned the recovered freed file to the disk using the Restore option of BACKUP.RESTORE. Now you want to find out whether any records in the file were deleted.

Note: The LISTFILE Customer Support Function is on your disk.

Assume that the file you recovered is named CUSTOMER and it is on your disk volume VOL2. You want to list in order all the records in the file.

1. Type: LINK LISTFILE
2. Press: Enter key

LISTFILE

Examples using LISTFILE (continued)

You will see the List File Menu screen. Choose 2, as indicated, to get the sequential list.

List File Menu

13-010

Choose one of the following:

1. Description of List File
2. List file sequentially
3. List file by index keys
4. List records sequentially
5. List records by index keys

9. End List File

Choice

2

Press the Enter key.

The next screen asks where the information is to be shown. Since you want the information to be shown on the screen only, choose 1 as indicated.

Note: Since the information will not be printed, the printer number is ignored.

List File Sequentially

13-022

Information and messages to:

1-Screen only
2-Screen and printer
3-Printer only
1

Printer number
10-First printer
11-Second printer
10

Required when
printer used

Cmd 9 Cancel
? Help

Press the Enter key.

LISTFILE

Examples using LISTFILE (continued)

The next screen asks for information about the records to be listed.

- For "List records," choose 1 to get both the records and summary information about the records.
- For "List internal representation," choose 2 to get only the graphic representation of the records.
- For "List deleted records," choose 1 to include deleted records in the list of records.
- For "Read all file area," choose 2 to include only the records up to the end-of-data marker.

List File Sequentially

13-032

List records Required

- 1-List summary and records
- 2-List summary only
- 1

List internal representation Required

- 1-List internal representation
- 2-List graphic only
- 1

List deleted records Required

- 1-List deleted records
- 2-Skip deleted records
- 2

Read all file area Required

- 1-Read entire file area
- 2-Read current data only
- 2

Cmd 9 Cancel
? Help

Press the Enter key.

The next screen asks you to specify information about the files to be listed. Type CUSTOMER as the name of the file and VOL2 as the input VOLID, as indicated.

If you do not enter an input VOLID when your drive number is 5 (disk), the computer will list information for the first file it finds with the filename you specified. The computer starts the search from the *first* volume on your disk.

List File Sequentially

13-042

Input Filename <u>CUSTOMER</u>	Required
Input VOLID <u>VOL2</u>	Optional
Input drive number <u>5</u>	Optional

Cmd 9 Cancel
? Help

Press the Enter key.

The next screen gives you the summary information you asked for. You can see that CUSTOMER contains 3 records and no records were deleted.

List File Sequentially

13-132

Summary Information

Input filename	- CUSTOMER
File type	- 04
Date created	- 00/00/00
Last update	- 00/00/00
Record length	- 79
Total records	- 3
Records read	- 3
Deleted records	- 0

Press Enter to continue

Cmd 9 Cancel

Press the Enter key.

LISTFILE

Examples using LISTFILE (continued)

The next screen shows successful completion of LISTFILE.

List File Sequentially

13-072

List File successful.

Press Enter to return to menu

Screens

This section contains the screens that can appear while you are running LISTFILE. They are shown in numeric order by screen number, starting with the lowest screen number, so that you can quickly find the screen you want.

The order of screens in this section is not the order in which they appear while you are running LISTFILE. The order depends on the choices you select on the menu and your answers to certain prompts.

LISTFILE

Screens (continued)

Screen 13-010 (List File Menu)

List File Menu

13-010

Choose one of the following:

1. Description of List File
2. List file sequentially
3. List file by index keys
4. List records sequentially
5. List records by index keys

9. End List File

Choice

-

You see screen 13-010 after you type LINK LISTFILE and press the Enter key.

This screen lets you choose one of the following:

1. **Description of List File.** Choose 1 to get a description of LISTFILE. The next screen you will see is screen 13-141.
2. **List File Sequentially.** Choose 2 to get a listing in order of all the records of a file. The next screen you will see is 13-022.
3. **List File by Index Keys.** Choose 3 to get a listing of all the keys and their associated records. If you choose 3, each key in the index file is read; then, the record in the file associated with the key is listed. The next screen you will see is screen 13-023.
4. **List Records Sequentially.** Choose 4 to get a listing in order of specific records you want to be printed or displayed. The next screen you will see is screen 13-024.
5. **List Records by Index Keys.** Choose 5 to get a listing of records you want to be printed or displayed by using specific keys in the index file. If you choose this option, each key you specify in the index file is read; then, the record in the file associated with the key is listed. The next screen you will see is screen 13-025.

9. **End List File.** Choose 9 to end LISTFILE. The next screen you will see shows the READY INPUT status.

Type 1, 2, 3, 4, 5, or 9.

LISTFILE

Screens (continued)

Screen 13-022 (List File Sequentially)
Screen 13-023 (List File by Index Keys)
Screen 13-024 (List Records Sequentially)
Screen 13-025 (List Records by Index Keys)

List Records by Index Keys

13-025

List Records Sequentially

13-024

List File by Index Keys

13-023

List File Sequentially

13-022

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only
- 3

Printer number
10-First printer
11-Second printer
10

Required when
printer used

Cmd 9 Cancel
? Help

You see screen 13-022 after you choose 2 on screen 13-010, the List File Menu screen.

You see screen 13-023 after you choose 3 on screen 13-010, the List File Menu screen.

You see screen 13-024 after you choose 4 on screen 13-010, the List File Menu screen.

You see screen 13-025 after you choose 5 on screen 13-010, the List File Menu screen.

These screens ask you to tell where the information is to be shown.

Information and messages to:

1-Screen only. Choose 1 to show all information and messages only on the screen.

2-Screen and printer. Choose 2 to show all information and messages on both the screen and printer.

3-Printer only. Choose 3 to show all information and messages only on the printer.

Type 1, 2, or 3 in the space provided. (The first time this screen appears, this field contains 3. If you do not type a value, then 3 is assumed.)

LISTFILE

Screens (continued)

Printer number:

10-First printer. Choose 10 to show all information and messages on the first printer.

11-Second printer. Choose 11 to show all information and messages on the second printer.

Type 10 or 11 in the space provided. (The first time this screen appears, this field contains 10. If you do not type a value, then 10 is assumed.)

After screen 13-022, the next screen you will see is screen 13-032.

After screen 13-023, the next screen you will see is screen 13-033.

After screen 13-024, the next screen you will see is screen 13-034.

After screen 13-025, the next screen you will see is screen 13-035.

Screen 13-032 (List File Sequentially)
Screen 13-033 (List File by Index Keys)
Screen 13-034 (List Records Sequentially)
Screen 13-035 (List Records by Index Keys)

List Records by Index Keys

13-035

List Records Sequentially

13-034

List File by Index Keys

13-033

List File Sequentially

13-032

List records

Required

- 1-List summary and records
- 2-List summary only
- 1

List internal representation

Required

- 1-List internal representation
- 2-List graphic only
- 1

List deleted records

Required

- 1-List deleted records
- 2-Skip deleted records
- 2

Read all file area

Required

- 1-Read entire file area
- 2-Read current data only
- 2

Cmd 9 Cancel
? Help

LISTFILE

Screens (continued)

You see screen 13-032 after screen 13-022.

You see screen 13-033 after screen 13-023.

You see screen 13-034 after screen 13-024.

You see screen 13-035 after screen 13-025.

These screens ask you for information about the records to be listed.

List records

1-List summary and records. Choose 1 to get both the records and the summary information about the records and keys.

2-List summary only. Choose 2 to get only the summary information about the records and keys.

Type 1 or 2 in the space provided. (The first time this screen appears, this field contains 1. If you do not type a value, then 1 is assumed.)

List internal representation

1-List internal representation. Choose 1 to get both the internal (hexadecimal) and graphic representation of the records.

Note: If you do not need the internal (hexadecimal) representation, do not choose 1.

2-List graphic only. Choose 2 to get only the graphic representation of the records.

Type 1 or 2 in the space provided. (The first time this screen appears, this field contains 1. If you do not type a value, then 1 is assumed.)

List deleted records

1-List deleted records. Choose 1 to include deleted records in the list of records.

2-Skip deleted records. Choose 2 to skip deleted records in the list of records. All of the records are still read, but the deleted records are not listed.

Type 1 or 2 in the space provided. (The first time this screen appears, this field contains 2. If you do not type a value, then 2 is assumed.)

LISTFILE

Screens (continued)

Read all file area

1-Read entire file area. Choose 1 to include the records between the end-of-data marker and the end-of-file marker in the list of records. Any records found past the end-of-data marker will be identified with the letter P when listed.

2-Read current data only. Choose 2 to include only the records up to the end-of-data marker.

Type 1 or 2 in the space provided. (The first time this screen appears, this field contains 2. If you do not type a value, then 2 is assumed.)

After screen 13-032, the next screen you will see is screen 13-042.

After screen 13-033, the next screen you will see is screen 13-063.

After screen 13-034, the next screen you will see is screen 13-044.

After screen 13-035, the next screen you will see is screen 13-065.

Screen 13-042 (List File Sequentially)
Screen 13-044 (List Records Sequentially)

The diagram illustrates two overlapping terminal screens. The background screen, titled "List Records Sequentially" (ID: 13-044), is partially obscured by the foreground screen. The foreground screen, titled "List File Sequentially" (ID: 13-042), contains the following text:

Input Filename	Required
Input VOLID	Optional
Input drive number	Optional

At the bottom right of the foreground screen, the following options are listed:

Cmd 9 Cancel
? Help

You see screen 13-042 after screen 13-032.

You see screen 13-044 after screen 13-034.

These screens ask you for information about the files to be listed.

LISTFILE

Screens (continued)

Input Filename. This is the name of the file to be listed.

Type the name in the space provided.

Input VOLID. This is the name of the disk volume or diskette that contains the file to be listed.

Type the name of the disk volume or diskette in the space provided.

If you do not enter an input VOLID when your drive number is 5 (disk), the computer will list information for the first file it finds with the filename you specified. The computer starts the search from the *first* volume on your disk.

Input drive number. This is the number of the drive that contains the file to be listed.

Type the number in the space provided.

After screen 13-042, if you chose 2 (list summary only) in screen 13-032, the next screen you will see is screen 13-162. If you chose 1 (list summary and records), the next screen you will see is screen 13-052.

After screen 13-044, the next screen you will see is screen 13-094.

Screen 13-052 (List File Sequentially)
 Screen 13-053 (List File by Index Keys)
 Screen 13-054 (List Records Sequentially)
 Screen 13-055 (List Records by Index Keys)

List Records by Index Keys

13-055

List Records Sequentially

13-054

List File Sequentially

13-052

List File by Index Keys

13-053

D-deleted O-overflow key P-past end of data
 1.....10.....20.....30.....40.....50.....60

Error 7916 D O
 Line no. 1

Record no. 99 Key

yy
 00

Line no. 2

yyyyyyyyyyyyyyyyyyyy
 00000000000000000000

Line no. 1

Record no. 1 Key This is an
 ***** This is an example of a listed record *****
 5555554E88A48A48948A8999849848498AA884988998455555555444444
 CCCCCC038920920150571473506601039235409536940CCCCCCCC000000

Line no. 2

yyyyyyyyyyyyyyyyyyyy
 00000000000000000000
 1.....10.....20.....30.....40.....50.....60

LISTFILE

Screens (continued)

You see screen 13-052 after screen 13-042 if you chose 1 (list summary and records) in screen 13-032.

You see screen 13-053 after screen 13-063 if you chose 1 (list summary and records) in screen 13-033.

You see screen 13-054 after screen 13-094 if you chose 1 (list summary and records) in screen 13-034.

You see screen 13-055 after screen 13-105 if you chose 1 (list summary and records) in screen 13-035.

For each record, the following information may appear:

Error xxxx—You see this field only if an error is detected. The error code shows an inconsistency between the key in the index file and the associated record.

D—You see this letter only if the record is a deleted record.

O—You see this letter only if you use index files and the key was obtained from the overflow area of the index file.

P—You see this letter only if the record was obtained from past the end-of-data marker.

Record no. xxxx—You always see this field to show you the number of the record within the file.

Key xxxx—You see this field only if you use index files. This field shows you the key from the index file.

Graphic representation—You always see this representation to identify the record.

Internal (hexadecimal) representation—You see this representation if you ask for it. This representation appears vertically in two lines below each line of data.

Press the Enter key for more screens until all the record information is completed.

After screen 13-052, the next screen you will see is screen 13-132.

After screen 13-053, the next screen you will see is screen 13-113.

After screen 13-054, the next screen you will see is screen 13-134.

After screen 13-055, the next screen you will see is screen 13-125.

LISTFILE

Screens (continued)

Screen 13-063 (List File by Index Keys) Screen 13-065 (List Records by Index Keys)

List Records by Index Keys		13-065
List File by Index Keys		13-063
Input Filename	Required	
Input VOLID	Optional	
Input drive number	Optional	
Index Filename	Required	
Index VOLID	Optional	
Index drive number	Optional	
		Cmd 9 Cancel ? Help

You see screen 13-063 after screen 13-033.

You see screen 13-065 after screen 13-035.

These screens ask you for information about the files to be listed.

Input filename. This is the name of the file to be listed. Type the name in the space provided.

Input VOLID. This is the name of the disk volume or diskette that contains the file to be listed. Type the name of the disk volume or diskette in the space provided.

If you do not enter an input VOLID when your drive number is 5 (disk), the computer will list information for the first file it finds with the filename you specified. The computer starts the search from the *first* volume on your disk.

Input drive number. This is the number of the drive that contains the file to be listed. Type the number in the space provided.

Index filename. This is the name of the index file to be used. Type the name in the space provided.

LISTFILE

Screens (continued)

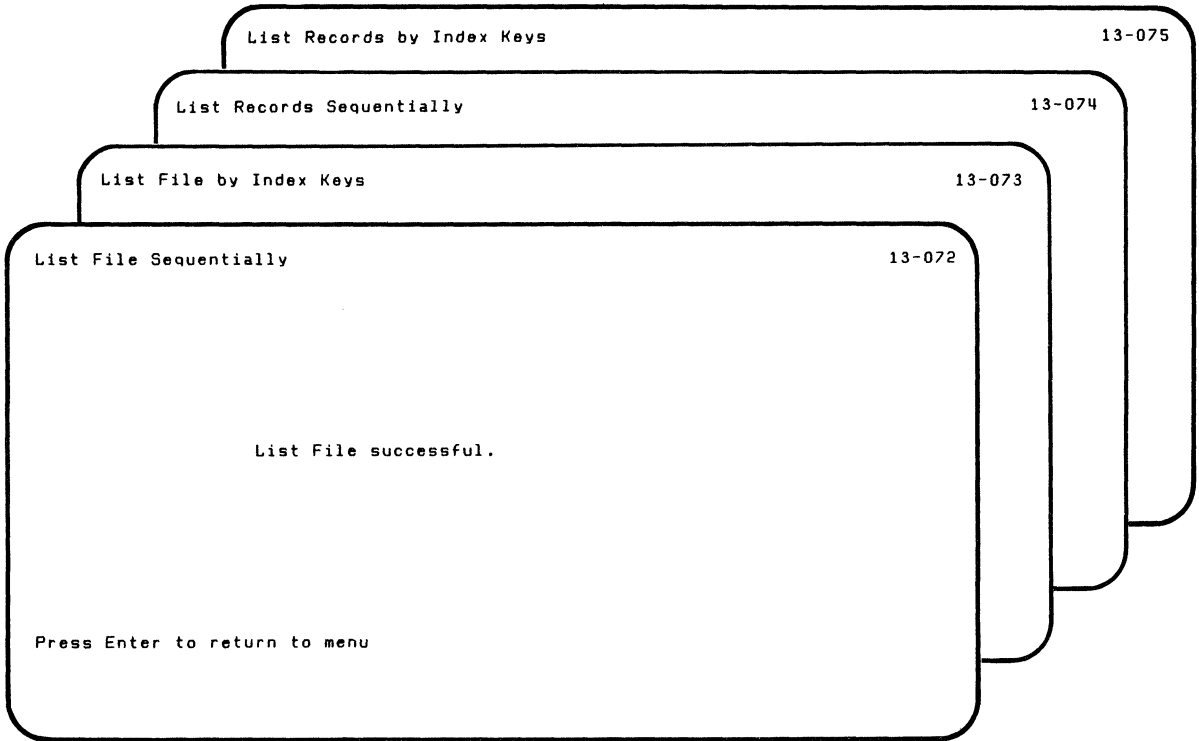
Index VOLID. This is the name of the disk volume or diskette that contains the index file to be used. Type the name of the disk volume or diskette in the space provided.

Index drive number. This is the number of the drive that contains the index file to be used. Type the number in the space provided.

After screen 13-063, if you chose 2 (list summary only) in screen 13-032, the next screen you will see is screen 13-163. If you chose 1 (list summary and records), the next screen you will see is screen 13-053.

After screen 13-065, the next screen you will see is 13-105.

Screen 13-072 (List File Sequentially)
Screen 13-073 (List File by Index Keys)
Screen 13-074 (List Records Sequentially)
Screen 13-075 (List Records by Index Keys)



LISTFILE

Screens (continued)

You see screen 13-072 after screen 13-132 if the listing of the information is successful.

You see screen 13-073 after screen 13-113 if the listing of the information is successful.

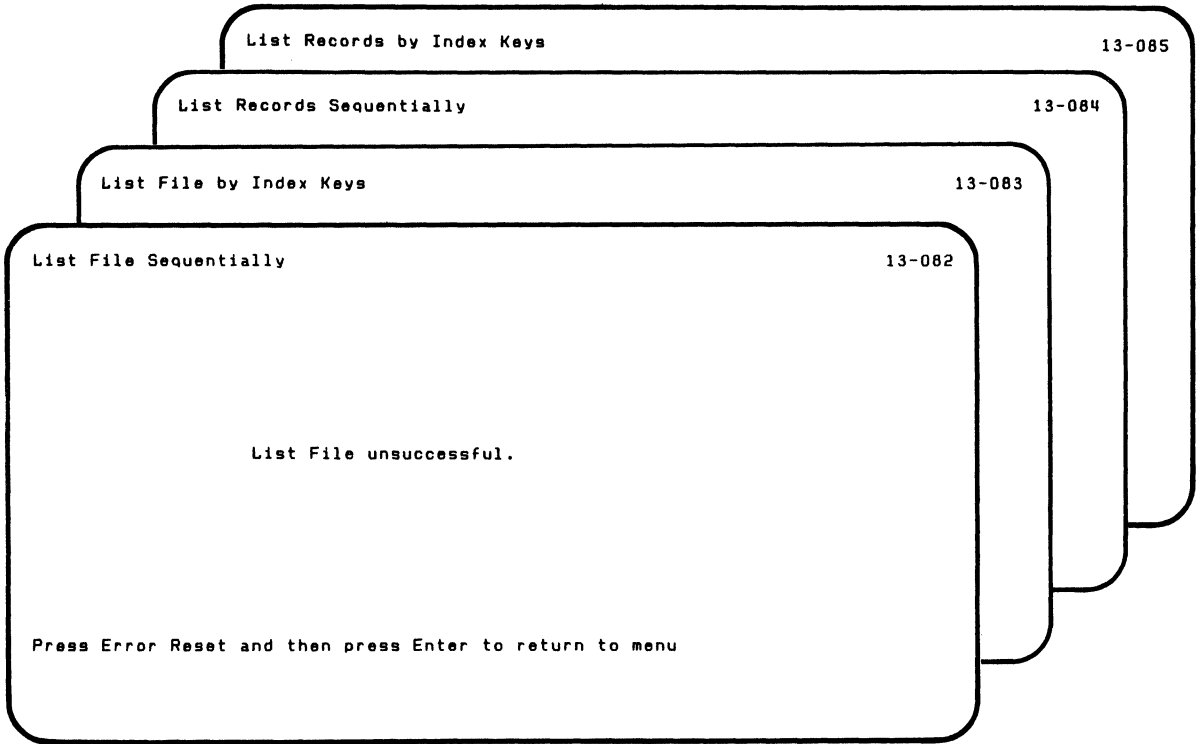
You see screen 13-074 after screen 13-134 if the listing of the information is successful.

You see screen 13-075 after screen 13-125 if the listing of the information is successful.

These screens show you successful completion of LISTFILE.

The next screen you will see is screen 13-010, the List File Menu screen.

Screen 13-082 (List File Sequentially)
Screen 13-083 (List File by Index Keys)
Screen 13-084 (List Records Sequentially)
Screen 13-085 (List Records by Index Keys)



LISTFILE

Screens (continued)

You see screen 13-082 after screen 13-132 if the listing of the information is not successful.

You see screen 13-083 after screen 13-113 if the listing of the information is not successful.

You see screen 13-084 after screen 13-134 if the listing of the information is not successful.

You see screen 13-085 after screen 13-125 if the listing of the information is not successful.

These screens show you unsuccessful completion of LISTFILE. If there are inconsistencies between your file and the index file, then an error will also be given.

When you see these screens, the action and error codes are shown on the status line. Use these codes to correct the problem. For information about action and error codes, see the *System Messages* manual.

The next screen you will see is screen 13-010, the List File Menu screen.

Screen 13-094 (List Records Sequentially)

List Records Sequentially

13-094

Starting record number

Required

Ending record number

Required

Cmd 9 Cancel
? Help

You see screen 13-094 after screen 13-044.

This screen asks you to tell which records you want to be listed.

LISTFILE

Screens (continued)

Starting record number. This is the record number of the first record to be listed.

Type the number in the space provided.

Ending record number. This is the record number of the last record to be listed.

Enter the number in the space provided.

If you chose 2 (list summary only) on screen 13-034, the next screen you will see is screen 13-164. If you chose 1 (list summary and records), the next screen you will see is screen 13-054.

Screen 13-105 (List Records by Index Keys)

List Records by Index Keys

13-105

Starting key

Optional

Ending key

Optional

Cmd 9 Cancel
? Help

You see screen 13-105 after screen 13-065.

This screen asks you for the index keys to be used with the records to be listed.

LISTFILE

Screens (continued)

Starting key. This is the key associated with the first record to be listed.

Type the number in the space provided. (If you do not enter a value, a value of binary 0's is assumed.)

Ending key. This is the key associated with the last record to be listed.

Type the number in the space provided. (If you do not enter a value, a value of binary 1's is assumed.)

If you chose 2 (list summary only) on screen 13-035, the next screen you will see is screen 13-165. If you chose 1 (list summary and records), the next screen you will see is screen 13-055.

Screen 13-113 (List File by Index Keys)

List File by Index Keys

13-113

Summary Information

Input filename	- Data file
File type	- 04
Date created	- YY/MM/DD
Last update	- YY/MM/DD
Record length	- NNNN
Total records	- NNNNN
Records read	- DDDDD
Deleted records	- NNNNN

Index filename	- Key file
Date created	- YY/MM/DD
Last update	- YY/MM/DD
Position of key	- NNNN
Length of key	- NNNN
Total keys	- NNNNN
Deleted keys	- NNNNN
Overflow keys	- NNNNN

Press Enter to continue

Cmd 9 Cancel

You see screen 13-113 or a printing of the information in screen 13-113 after screen 13-053 or screen 13-163.

This screen gives you the summary information you asked for.

LISTFILE

Screens (continued)

In this screen:

1. "Total records" should be the same as "Total keys."
2. "Deleted records" should be the same as "Deleted keys."
3. "Last update" for the input file should be the same as "Last update" for the index file.

If any of these items do not match, there is an inconsistency between the index file and the input file.

The next screen you will see is screen 13-073 (if the list is successful) or screen 13-083 (if the list is not successful).

Screen 13-125 (List Records by Index Keys)

List Records by Index Keys

13-125

Summary Information

Input filename	- Data file
File type	- 04
Date created	- YY/MM/DD
Last update	- YY/MM/DD
Record length	- NNNN
Total records	- NNNNN
Records read	- DDDDD
Deleted records	- NNNNN
Index filename	- Key file
Date created	- YY/MM/DD
Last update	- YY/MM/DD
Position of key	- NNNN
Length of key	- NNNN

Press Enter to continue

Cmd 9 Cancel

You see screen 13-125 or a printing of the information in screen 13-125 after screen 13-055 or screen 13-165.

This screen gives you the summary information you requested.

LISTFILE

Screens (continued)

The next screen you will see is screen 13-075 (if the list is successful) or screen 13-085 (if the list is not successful).

Screen 13-132 (List File Sequentially)
Screen 13-134 (List Records Sequentially)

List Records Sequentially

13-134

List File Sequentially

13-132

Summary Information

Input filename	- Data file
File type	- 04
Date created	- YY/MM/DD
Last update	- YY/MM/DD
Record length	- NNNN
Total records	- NNNNN
Records read	- DDDDD
Deleted records	- NNNNN

Press Enter to continue

Cmd 9 Cancel

LISTFILE

Screens (continued)

You see screen 13-132 or a printing of the information in screen 13-132 after screen 13-052 or screen 13-162.

You see screen 13-134 or a printing of the information in screen 13-134 after screen 13-054 or screen 13-164.

These screens give you the summary information you asked for.

After screen 13-132, the next screen you will see is screen 13-072 (if the list was successful) or screen 13-082 (if the list was not successful).

After screen 13-134, the next screen you will see is screen 13-074 (if the list was successful) or screen 13-084 (if the list was not successful).

Screen 13-141 (Description of List File)

Description of List File

13-141

The following keys are used in all Customer Support Functions:

Enter - Press Enter to advance to the next screen when all requested information has been typed in.

? - If '? Help' appears on the screen, you can get more information by entering a ? in the first position of that field, and then pressing Enter.

Cmd 9 - If 'Cmd 9 Cancel' appears on the screen, and you wish to return to the menu, press and hold the Cmd key while pressing the 9 key on the numeric key pad. It is not necessary to press the Enter key.

Press Enter to continue

Cmd 9 Cancel

You see screen 13-141 after you choose 1 on screen 13-010, the List File Menu screen.

LISTFILE

Screens (continued)

This screen tells you about keys used in all the Customer Support Functions. It describes:

1. How to use the Enter key
2. How to get help
3. How to cancel and start over

The next screen you will see is screen 13-151.

Screen 13-151 (Description of List File)

Description of List File

13-151

The main purpose of this Customer Support Function is to help analyze problems associated with a master file and any of its index files.

The file type must be either a data file (type 04), a Basic exchange (type Bx) or an H exchange (type Hx). These file types can be accessed sequentially. In addition, a data file can also be accessed by an index file.

When accessing by an index file, this Customer Support Function will identify any mis-matches between the keys in the index file and related information in the master file.

The List File Customer Support Function enables you to list an entire file, a range of records or one record.

Press Enter to return to option menu

LISTFILE

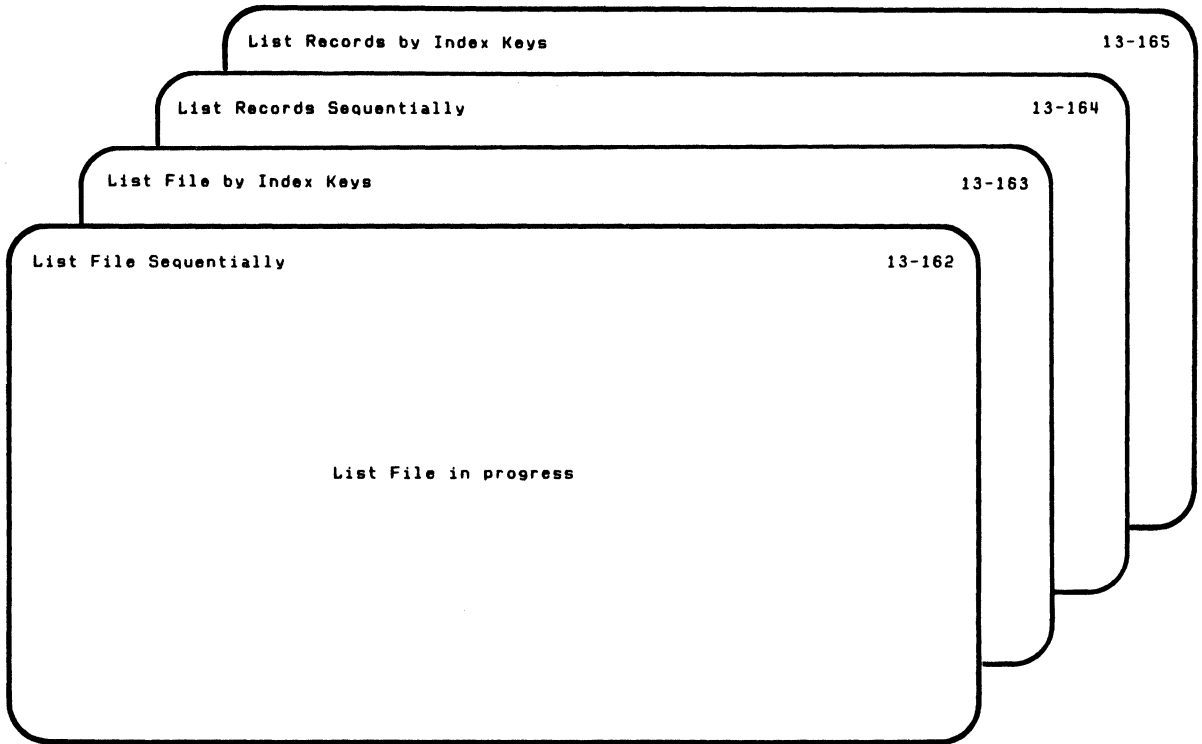
Screens (continued)

You see screen 13-151 after screen 13-141.

This screen tells you the types of files that can be listed.

The next screen you will see is screen 13-010, the List File Menu screen.

Screen 13-162 (List File Sequentially)
Screen 13-163 (List File by Index Keys)
Screen 13-164 (List Records Sequentially)
Screen 13-165 (List Records by Index Keys)



LISTFILE

Screens (continued)

You see screen 13-162 after screen 13-042 if you chose 2 (list summary only) in screen 13-032.

You see screen 13-163 after screen 13-063 if you chose 2 (list summary only) in screen 13-033.

You see screen 13-164 after screen 13-094 if you chose 2 (list summary only) in screen 13-034.

You see screen 13-165 after screen 13-105 if you chose 2 (list summary only) in screen 13-035.

These screens are shown while the information is being printed.

After the storage information is printed:

After screen 13-162, the next screen you will see is screen 13-132.

After screen 13-163, the next screen you will see is screen 13-113.

After screen 13-164, the next screen you will see is screen 13-134.

After screen 13-165, the next screen you will see is screen 13-125.

Chapter 7. LISTSTOR

Introduction

Note: LISTSTOR is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

The List Storage Information (LISTSTOR) Customer Support Function lets you examine the condition of the machine and the program running at the time a problem occurred. At your request, it prints the storage information, or it uses your answers to prompts to list specific storage information.

You should run this program when your IBM representative directs you to run LISTSTOR.

LISTSTOR

Functions of LISTSTOR

LISTSTOR can be used to list storage information. If you wish, you can ask for a listing of each of the following:

- All storage information except the BASIC program listing
- Specific storage information
- Specific storage locations
- Specific disk storage locations

When you request specific storage information, you can ask for the following:

- System features and status
 - Level of the system
 - Amount of random access storage available on the machine
 - Status of each diskette drive attached
 - Status of each printer attached
 - Station ID assigned to the machine
 - Current program
 - System variables
 - Character set
 - Shift state
 - Machine updates
 - Part numbers
- BASIC program status
 - Name of the program loaded
 - Last line that was executed
 - Last error that occurred
 - ON conditions set
 - OPTIONS that have been set
 - GOSUB information
 - Procedure file information

-
- BASIC variables
 - BASIC open files
 - BASIC program listing
 - Internal representation of System/23 storage
 - Internal representation of disk storage

LISTSTOR

LISTSTOR choices

These are the choices you have on the menu screen for LISTSTOR.

1. *Description of List Storage Information*, which describes the LISTSTOR Customer Support Function.
2. *List storage information using recommendations*, which lets you get a fast printing of all the System/23 storage information, except the BASIC program listing. When this option is selected, the storage information is immediately printed on printer #10, the first printer.
3. *List storage information*, which lets you choose which storage information you want to list.
4. *List internal representation of storage*, which lets you tell which System/23 storage locations you want to list.
5. *Copy storage information from disk to diskette*, which lets you copy to a diskette the System/23 storage information that you saved on the disk.
6. *Copy disk storage information to diskette*, which lets you copy disk storage information to a diskette.
7. *List internal representation of disk storage*, which lets you tell which disk storage locations you want to list.

Examples of using these options are shown later in this chapter under "Examples using LISTSTOR" on page 7-12.

Running LISTSTOR

Note: LISTSTOR is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

Before you begin

You need these items before you start LISTSTOR:

- The LISTSTOR Customer Support Function
- The BASIC Exchange diskette that contains your file named STGDMP to save System/23 storage information or your file named IMPDMP to save disk storage information.

When a problem occurs, you must make a copy of the storage information at that time. The System/23 storage information can be saved either on the diskette file named STGDMP or on the disk. This file is then used by LISTSTOR.

You can save disk storage information on the diskette file named IMPDMP using option 6 of the List Storage Information menu. An explanation of how to prepare your IMPDMP diskette follows and an example of using option 6 is shown under "Example 5. Copy disk storage information to diskette" on page 7-42.

LISTSTOR

Running LISTSTOR (continued)

Preparing a diskette to save List Storage Information

The following procedure should be used when preparing a diskette to save List Storage information:

1. Insert the Customer Support Functions diskette that contains the PREPARE function into any diskette drive.
2. Insert the diskette you wish to prepare in any other drive. (This diskette can be type 1, 2, or 2D.)

Warning: All information on the diskette to be prepared will be destroyed. Be sure that the diskette does not have any useful information on it.

3. Enter on the input line:

PROC STGDUMP (to prepare a diskette to hold System/23 storage information)

or

PROC DSKDUMP (to prepare a diskette to hold the 5247 Disk storage information)

4. Press the Enter key.
5. When you see the "Prepare Diskette Procedure File" screen, 05-189, go to step 6.
6. Press the Error Reset key.

-
7. Replace the "X" on the screen with the number of the diskette drive containing the diskette you want to prepare (not the Customer Support Functions diskette). To do this, simply type over the "X"
 8. Press the Enter key.
 9. When READY INPUT appears on the status line, you are finished.
 10. Place a label on your diskette with the following information on it.

List Storage information-STGDMP or IMPDMP

Today's date _____

Used date _____

Note: You should always have one or two diskettes handy to save List Storage information. You can create those diskettes at any time, using the above procedure.

LISTSTOR

Running LISTSTOR (continued)

Saving System/23 storage information on a diskette

The following procedure should be used to save the storage information on a diskette. (See "Saving System/23 storage information on the disk" on page 7-10 if you want to save the information on the disk.)

1. Press the Hold key, the Test key, and then the "9" key on the top row of the keyboard. You will see "MONITOR" at the top of the screen.
2. Insert the diskette you labeled "List Storage information-STGDMP" in drive 1, or drive 3 if your System/23 has no drives, but does have a separate diskette unit.
3. Press the "F" key; then press the "0" (zero) key on the top row of the keyboard.
4. When the system has finished saving information on the diskette, a ■ will appear on the screen.
 - a. If the ■ is not blinking, go to step 5.
 - b. If the center of ■ is blinking, do the following:
 - 1) Be sure the diskette you are using was created as described in the *Operator Reference* book under "Preparing a diskette to save list storage information."
 - 2) If the diskette is correct, re-try the operation by opening and closing the drive handle and then pressing the F and 0 (zero) keys again.
 - 3) If a second failure occurs, remove the diskette and save it for reuse. Turn the computer off, then on again. Continue with normal operations.

-
5. If the ■ is not blinking, do the following:
 - a. Press the "E" key.
 - b. Remove the "List Storage information" diskette.
 - c. Write today's date after "USED DATE."

LISTSTOR

Running LISTSTOR (continued)

Saving System/23 storage information on the disk

Use the following procedure to save the System/23 storage information on the disk. This information can then be copied to a Basic Exchange diskette using option 5 of the List Storage Information menu. An example of using option 5 is shown under "Example 4. Copy storage information from disk to diskette" on page 7-38.

1. Press the Hold key, the Test key, and then the "9" key on the top row of the keyboard. You will see "MONITOR" at the top of the screen.
2. Press the "F" key, the press the "D" key on the keyboard.
3. Press the "E" key to exit the monitor mode.

Contact your service representative for further assistance if needed.

Operating considerations

As you type your choices for the storage to be listed, the values you type are saved by LISTSTOR. In this way, if you wish to list more storage using the same choices, you can rapidly go through the screens by pressing Enter for each screen.

LISTSTOR will not list a BASIC program that has been locked.

Warning: Some of the machine updates and all of the part numbers come from the machine that LISTSTOR is being run on, and are not from the STGDMP file. This information is only valid if it is being printed on the same machine that the STGDMP file was created on, including the same set of machine updates.

LISTSTOR

Examples using LISTSTOR

Note: LISTSTOR is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

Six examples follow. They include an example for options 2 through 7 on the List Storage Information menu.

Example 1. Listing storage information

Suppose you wish to specify the storage information you want to be listed.

1. Insert the Customer Support Functions diskette that contains LISTSTOR
2. Insert your diskette that contains STGDMP
3. Type: LINK LISTSTOR
4. Press: Enter key

You will see the List Storage Information Menu screen.
Choose 3, as indicated, to be able to ask for the storage
information you want.

List Storage Information Menu

12-010

Choose one of the following:

1. Description of List Storage Information
2. List Storage Information using Recommendations
3. List Storage Information
4. List Internal Representation of Storage
5. Copy Storage Information from Disk to Diskette
6. Copy Disk Storage Information to Diskette
7. List Internal Representation of Disk Storage

9. End List Storage Information

Choice

3

Press the Enter key.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen asks where the information is to be shown. Since you want the information to be shown on the screen only, choose 1 as indicated.

Note: If you choose 3 (printer only), the storage information presented in this example will not be shown on the screen, but will be shown on the printer. It will not be divided into screens as shown here.

Note: Since the information will not be printed, the printer number is ignored.

List Storage Information

12-043

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only
- 1

Printer number

- 10-First printer
- 11-Second printer
- 10

Required when
printer used

Cmd 9 Cancel
? Help

Press the Enter key.

The next screen asks for the storage information you want to be listed.

- In 1, 2, 3, and 4, type Y, as indicated, to get the indicated information.
- In 5, type N, as indicated, so you do not get a listing of the BASIC program.

Note: If you type Y for 1, 2, 3, and 4, and N for 5, you get the same information as if you chose option 2 on the List Storage Information Menu screen.

List Storage Information

12-053

Information desired:

- | | | |
|----|--|----------|
| 1. | System features
and status (Y,N)
Y | Required |
| | BASIC program | |
| 2. | Status (Y,N)
Y | Required |
| 3. | Variables (Y,N)
Y | Required |
| 4. | Open files (Y,N)
Y | Required |
| 5. | Listing (Y,N)
N | Required |

Cmd 9 Cancel
? Help

Press the Enter key.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen is shown while the storage information is being processed.

List Storage Information

12-093

List Storage Information in progress.

The next screen gives you the information you asked for.

List Storage Information

12-073

ID	Title	Information
1	System Features and Status	
1-01	System level	1.02
1-02	Storage size	64K
1-03	Diskette drives	DRIVE SIZE VOLID
		1 1 VSS001
		2 1 LFD002
1-04	Printers	*10 ACTIVE
		*11 NONE
1-05	Station identifier	01
1-06	Current program	BASIC Program
1-07	CNT	1
1-08	TIME#	23:52:00
1-09	DATE#	81/02/18
1-10	CODE	0
1-11	FILENUM	NONE

Press Enter to continue

Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen gives you more information you asked for.

List Storage Information

12-073

ID	Title	Information
1-12	ERR	0006
1-13	PROCIN	1
1-14	KSTAT*	ENTER
1-15	CMDKEY	NONE
1-16	Character set	1
1-17	Shift state	1
1-18	Machine updates	8A06
1-19	Part numbers	08493746 08493747
		08493748 08493754
		08493749 08493755
		08493760 08493761
		08493756 08493762
		08493763 08493764
		08493765 04481146
		04481145 04481702

Press Enter to continue

Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

The following screen gives you more information you asked for.

List Storage Information		12-073
ID	Title	Information
2	BASIC Program Status	
2-01	Program loaded	TOTAL.SRC/VSS001/1
2-02	Current line	800
2-03	Last error line	800
2-04	ON	ATTN GOTO 830
		OFLOW IGNORE
		SOFLOW IGNORE
		UFLOW SYSTEM
		ZDIV SYSTEM
		CONV GOTO 830
		ERROR SYSTEM
2-05	OPTION	BASE 1
		RD 15
		COLLATE ALTERNATE
		INVP EUROPEAN
Press Enter to continue		Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen gives you more information you asked for.

List Storage Information

12-073

ID	Title	Information
2-06	GOSUB information	740 720 700 680 660
2-07	Procedure files	PROC5/VSS001/1 PROC4/VSS001/1 PROC3/VSS001/1 PROC2/VSS001/1 PROC1/VSS001/1
3	BASIC Program Variables	
I		1
R		9.999999
A*		DIM*18

Press Enter to continue

Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

The next screen gives you more information you asked for.

List Storage Information

12-073

ID	Title	Information
A*		a
MAXSTRG*		DIM*255
MAXSTRG*		abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZ
OPQRSTUVWXYZ	abcdefghijklmnopqrstuvwxy	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnop
abcdefghijklmnop	QRSTUVWXYZ	abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZMOPQ
RSTUVWXYZ	abcdefghijklmnopqrstuvwxy	ABCDEFGHIJKLMNOPQRSTUVWXYZMOPQRSTUVWXYZ
INTARRAY		DIM(4,4)
INTARRAY(1,1)		0
INTARRAY(1,2)		1
INTARRAY(1,3)		2
INTARRAY(1,4)		3
INTARRAY(2,1)		4
INTARRAY(2,2)		5
INTARRAY(2,3)		6
INTARRAY(2,4)		7
INTARRAY(3,1)		8

Press Enter to continue

Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen gives you more information you asked for.

List Storage Information

12-073

ID	Title	Information
4	BASIC Program Open Files	
4-01	File number	*141
4-02	File specification	PROC1/VSS001/1
4-03	Type of file	05
4-04	File organization	SEQUENTIAL
4-05	Record length	0
4-06	Access type	INPUT
4-07	Last record	0
4-08	Number of blocks used	1
4-13	PAGEFLOW	60

Press Enter to continue

Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

The next screen gives you more information you asked for.

List Storage Information

12-073

ID	Title	Information
4-01	File number	*1
4-02	File specification	MASTER/LFD002/2
4-03	Type of file	04
4-04	File organization	KEYED
4-05	Record length	80
4-06	Access type	OUTIN
4-07	Last record	2
4-08	Number of blocks used	1
4-09	Key file	MASTER.INDEX/LFD002/2
4-10	Key	ab0defghij
4-11	Position of key	1
4-12	Length of key	10

Press Enter to continue

Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen shows successful completion of LISTSTOR.

List Storage Information

12-103

List Storage Information successful.

Press Enter to return to menu

Note: LISTSTOR is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

Example 2. Listing storage information using recommendations

Suppose you wish to get a fast printing of all storage information except the BASIC program listing.

1. Insert the Customer Support Functions diskette that contains LISTSTOR
2. Insert your diskette that contains STGDMP
3. Type: LINK LISTSTOR
4. Press: Enter key

You will see the List Storage Information Menu screen. Choose 2, as indicated, to get a fast printing of the storage information.

LISTSTOR

Examples using LISTSTOR (continued)

List Storage Information Menu

12-010

Choose one of the following:

1. Description of List Storage Information
2. List Storage Information using Recommendations
3. List Storage Information
4. List Internal Representation of Storage
5. Copy Storage Information from Disk to Diskette
6. Copy Disk Storage Information to Diskette
7. List Internal Representation of Disk Storage

9. End List Storage Information

Choice

2

Press the Enter key.

The next screen is shown while the storage information is being processed.

List Storage Information using Recommendations

12-092

List Storage Information in progress.

LISTSTOR

Examples using LISTSTOR (continued)

Since the information is printed, you will receive a sequential listing of the information, as shown below.

ID	Title	Information
1	System Features and Status	
1-01	System level	1.02
1-02	Storage size	64K
1-03	Diskette drives	DRIVE SIZE VOLID
		1 1 VSS001
		2 1 LFD002
1-04	Printers	*10 ACTIVE
		*11 NONE
1-05	Station identifier	01
1-06	Current program	BASIC Program
1-07	CNT	1
1-08	TIME#	23:52:00
1-09	DATE#	81/02/18
1-10	CODE	0
1-11	FILENUM	NONE
1-12	ERR	0006
1-13	PROCIN	1
1-14	KSTAT#	ENTER

(and so on)

4-01	File number	*1
4-02	File specification	MASTER/LFD002/2
4-03	Type of file	04
4-04	File organization	KEYED
4-05	Record length	80
4-06	Access type	OUTIN
4-07	Last record	2
4-08	Number of blocks used	1
4-09	Key file	MASTER.INDEX/LFD002/2
4-10	Key	ab0defghij
4-11	Position of key	1
4-12	Length of key	10

Note: In Example 1, you used option 3 to get a listing of all storage information except the BASIC program listing. In this example, you are using option 2 to get the same information.

In Example 1, you asked that the information be shown on the screen. In this example, the information is printed only. In Example 1, if you had indicated "Printer only" in screen 12-043, your listing of the information would have appeared the same as in this example.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen shows successful completion of LISTSTOR.

List Storage Information using Recommendations

12-102

List Storage Information successful.

Press Enter to return to menu

Note: LISTSTOR is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

Example 3. Listing internal storage representation

Suppose you wish to obtain a listing of storage between page 1, starting address FF80, and page 2, ending address C080.

1. Insert the Customer Support Functions diskette that contains LISTSTOR
2. Insert your diskette that contains STGDMP
3. Type: LINK LISTSTOR
4. Press: Enter key

You will see the List Storage Information Menu screen. Choose 4, as indicated, to get the storage listing.

LISTSTOR

Examples using LISTSTOR (continued)

List Storage Information Menu

12-010

Choose one of the following:

1. Description of List Storage Information
2. List Storage Information using Recommendations
3. List Storage Information
4. List Internal Representation of Storage
5. Copy Storage Information from Disk to Diskette
6. Copy Disk Storage Information to Diskette
7. List Internal Representation of Disk Storage

9. End List Storage Information

Choice

4

Press the Enter key.

The next screen asks where the information is to be shown. Since you want the information to be shown on the screen only, choose 1 as indicated.

Note: Since the information will not be printed, the printer number is ignored.

List Internal Representation of Storage

12-044

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only
- 1

Printer number

- 10-First printer
- 11-Second printer
- 10

Required when
printer used

Cmd 9 Cancel
? Help

Press the Enter key.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen asks for the address of the storage information to be listed.

- For "Starting page number," type 1, as indicated.
- For "Starting address," type FF80, as indicated.
- For "Ending page number," type 2, as indicated.
- For "Ending address," type C080, as indicated.

List Internal Representation of Storage

12-064

Starting page number	Required
1	
Starting address	Required
FF80	
Ending page number	Required
2	
Ending address	Required
C080	

Cmd 9 Cancel
? Help

Press the Enter key.

The next screen shows you the storage you asked to see.

List Internal Representation of Storage

12-084

Address	Internal Representation	Graphic
Page Number 1		
FF80	00 02 44 C0 F0 77 9C 00 07 F1 C0 F0 77 9C 00 07	..à{0iè..1{0iè..
FF90	F4 80 00 00 00 00 07 00 A1 00 28 98 00 88 80 00	4ø.....~...q.hø.
FFA0	20 00 00 01 00 10 00 00 00 00 00 00 00 00 00	.....
FFB0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
FFC0	00 00 00 00 00 00 C0 F0 67 9C 00 38 F0 F0 F1 F2	.....{0Aè..0012
FFD0	F0 40 D3 C5 E3 40 D4 C1 E7 E2 E3 D9 C7 5B 4D F2	0 LET MAXSTRG*(2
FFE0	F3 F6 7A F2 F5 F5 5D 7E 7F C2 C3 C4 C5 C6 C7 C8	36;255)="BCDEFGH
FFF0	C9 D1 D2 D3 D4 D6 D7 D8 D9 E2 E3 E4 E5 7F 00 00	IJKLMNOPQRSTU".."

Page Number 2

C000	C0 F0 6B 9C 00 32 1D 45 10 3A 03 02 36 00 00 00	{0,è....á.....
C010	00 00 00 3C 13 3A 03 02 55 00 00 00 00 00 00 3C	.....f.....
C020	C0 F0 67 9C 00 18 F0 F0 F5 F9 F0 40 C6 D6 D9 40	{0Aè..00590 FOR

Press Enter to continue

Cmd 9 Cancel

Press the Enter key.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen shows you more of the storage.

List Internal Representation of Storage

12-084

Address	Internal Representation	Graphic
C030	D1 7E F1 40 E3 D6 40 F4 C0 F0 6B 9C 00 32 36 80	J=1 TO 410, z...ø
C040	DE 80 DE 48 06 3A 01 01 00 00 00 00 00 00 00 3C	óøóç.....
C050	19 3A 01 04 00 00 00 00 00 00 00 00 3C 3D 3E 00 00	.....
C060	00 00 00 00 00 00 00 00 00 00 C0 F0 77 9C 00 0B	.....10iæ..
C070	F0 F0 F5 F9 F0 CD F0 7B 9C 00 09 00 02 4E C0 F0	00590ð0*æ....+10
C080	77 9C 00 07 F1 C0 F0 77 9C 00 07 F4 A1 00 28 98	iæ..110iæ..4"..q

Press Enter to continue

Cmd 9 Cancel

Press the Enter key.

The next screen shows successful completion of LISTSTOR.

List Internal Representation of Storage

12-104

List Storage Information successful.

Press Enter to return to menu

LISTSTOR

Examples using LISTSTOR (continued)

Note: The LISTSTOR Customer Support Function is on your disk.

Example 4. Copy storage information from disk to diskette

Suppose that earlier you were using a System/23 that does not have a diskette drive. You encountered a problem and you saved the System/23 storage information on the disk (as explained under "Saving System/23 storage information on the disk" on page 7-10). You now want to copy this information to a Basic Exchange diskette to send to IBM.

Do the following:

1. Go to a System/23 that has a diskette drive
2. Insert your STGDMP diskette
3. Type: LINK LISTSTOR
4. Press: Enter key

You will see the List Storage Information Menu screen.
Choose 5, as indicated, to copy the storage information to the
diskette.

List Storage Information Menu

12-010

Choose one of the following:

1. Description of List Storage Information
2. List Storage Information using Recommendations
3. List Storage Information
4. List Internal Representation of Storage
5. Copy Storage Information from Disk to Diskette
6. Copy Disk Storage Information to Diskette
7. List Internal Representation of Disk Storage

9. End List Storage Information

Choice
5

Press the Enter key.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen is shown while the storage information is being processed.

Copy Storage Information from Disk to Diskette

12-095

List Storage Information in progress.

The next screen shows successful completion of LISTSTOR.

Copy Storage Information from Disk to Diskette

12-105

List Storage Information successful.

Press Enter to return to menu

LISTSTOR

Examples using LISTSTOR (continued)

Note: The LISTSTOR Customer Support Function is on your disk.

Example 5. Copy disk storage information to diskette

Suppose you want to copy the storage information for the disk to a diskette.

1. Insert your IMPDMP diskette
2. Type: LINK LISTSTOR
3. Press: Enter key

You will see the List Storage Information Menu screen.
Choose 6, as indicated, to copy the storage to a diskette.

List Storage Information Menu

12-010

Choose one of the following:

1. Description of List Storage Information
2. List Storage Information using Recommendations
3. List Storage Information
4. List Internal Representation of Storage
5. Copy Storage Information from Disk to Diskette
6. Copy Disk Storage Information to Diskette
7. List Internal Representation of Disk Storage

9. End List Storage Information

Choice
6

Press the Enter key.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen is shown while the storage information is being processed.

Copy Disk Storage Information to Diskette

12-096

List Storage Information in progress.

The next screen shows successful completion of LISTSTOR.

Copy Disk Storage Information to Diskette

12-106

List Storage Information successful.

Press Enter to return to menu

LISTSTOR

Examples using LISTSTOR (continued)

Note: The LISTSTOR Customer Support Function is on your disk.

Example 6. Listing internal representation of disk storage

Suppose you wish to obtain a listing of storage on the disk between starting address 1000 and ending address 1100.

1. Insert your diskette that contains IMPDMP
2. Type: LINK LISTSTOR
3. Press: Enter key

You will see the List Storage Information Menu screen.
Choose 7, as indicated, to get the storage listing.

List Storage Information Menu

12-010

Choose one of the following:

1. Description of List Storage Information
2. List Storage Information using Recommendations
3. List Storage Information
4. List Internal Representation of Storage
5. Copy Storage Information from Disk to Diskette
6. Copy Disk Storage Information to Diskette
7. List Internal Representation of Disk Storage

9. End List Storage Information

Choice

7

Press the Enter key.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen asks where the information is to be shown. Because you want the information to be shown on the screen only, choose 1 as indicated.

Note: Because the information will not be printed, the printer number is ignored.

List Internal Representation of Disk Storage

12-047

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only

1

Printer number

- 10-First printer
- 11-Second printer

10

Required when
printer used

Cmd 9 Cancel
? Help

Press the Enter key.

The next screen asks for the address of the storage information to be listed.

- For "Starting address," type 1000.
- For "Ending address," type 1100.

List Internal Representation of Disk Storage

12-127

Starting address

—

Required

Ending address

—

Required

Cmd 9 Cancel
? Help

Press the Enter key

LISTSTOR

Examples using LISTSTOR (continued)

Starting address. This is the four-character internal representation (hexadecimal) address of the beginning of the storage information area to be listed. The address range is 0000 to FFFF.

Ending address. This is the four-character internal representation (hexadecimal) address of the end of the storage information area to be listed. The address range is 0000 to FFFF.

Type the address in the space provided.

The next screen you will see is screen 12-097.

The next screen is shown while the storage information is being processed.

List Internal Representation of Disk Storage

12-097

List Storage Information in progress.

LISTSTOR

Examples using LISTSTOR (continued)

The next screen shows you the storage you asked to see.

List Internal Representation of Disk Storage

12-087

Address	Internal Representation	Graphic
0000	E1 3E 00 F8 D1 3E 01 F8 6C 15 00 F8 B1 3E 03 F8	..8J..8%..8f..8
0010	A1 3E 04 F8 91 3E 05 F8 81 3E 06 F8 71 3E 07 F8	~..8j..8a..8é..8
0020	61 3E 08 F8 51 3E 09 F8 41 3E 0A F8 31 3E 0B F8	/..8é..8 ..8...8
0030	21 3E 0C F8 11 3E 0D F8 01 3E 0E F8 F1 3D 0F F8	...8...8...81..8
0040	E1 3D 10 F8 D1 3D 11 F8 C1 3D 12 F8 B1 3D 13 F8	..8J..8A..8f..8
0050	A1 3D 14 F8 91 3D 15 F8 81 3D 16 F8 71 3D 17 F8	~..8j..8a..8é..8
0060	61 3D 18 F8 51 3D 19 F8 41 3D 1A F8 31 3D 1B F8	/..8é..8 ..8...8
0070	21 3D 1C F8 11 3D 1D F8 01 3D 1E F8 F1 3C 1F F8	...8...8...81..8
0080	E1 3C 20 F8 D1 3C 21 F8 C1 3C 22 F8 B1 3C 23 F8	..8J..8A..8f..8
0090	A1 3C 24 F8 91 3C 25 F8 81 3C 26 F8 71 3C 27 F8	~..8j..8a..8é..8
00A0	61 3C 28 F8 51 3C 29 F8 41 3C 2A F8 31 3C 2B F8	/..8é..8 ..8...8
00B0	21 3C 2C F8 11 3C 2D F8 01 3C 2E F8 F1 3B 2F F8	...8...8...81..8
00C0	E1 3B 30 F8 D1 3B 31 F8 C1 3B 32 F8 B1 3B 33 F8	..8J..8A..8f..8
00D0	A1 3B 34 F8 91 3B 35 F8 81 3B 36 F8 71 3B 37 F8	~..8j..8a..8é..8
00E0	61 3B 38 F8 51 3B 39 F8 41 3B 3A F8 31 3B 3B F8	/..8é..8 ..8...8
00F0	21 3B 3C F8 11 3B 3D F8 01 3B 3E F8 F1 3A 3F F8	...8...8...81..8

Press Enter to continue

Cmd 9 Cancel

Press the Enter key

The next screen shows successful completion of LISTSTOR.

List Internal Representation of Disk Storage

12-107

List Storage Information successful.

Press Enter to return to menu

LISTSTOR

Screens

This section contains the screens that can appear while you are running LISTSTOR. They are shown in numeric order by screen number, starting with the lowest screen number, so that you can quickly find the screen you want.

The order of screens in this section is not the order in which they appear while you are running LISTSTOR. The order depends on the choices you select on the menu and your answers to certain prompts.

Screen 12-010 (List Storage Information Menu)

List Storage Information Menu

12-010

Choose one of the following:

1. Description of List Storage Information
2. List Storage Information using Recommendations
3. List Storage Information
4. List Internal Representation of Storage
5. Copy Storage Information from Disk to Diskette
6. Copy Disk Storage Information to Diskette
7. List Internal Representation of Disk Storage

9. End List Storage Information

Choice

3

You see screen 12-010 after you type LINK LISTSTOR and press the Enter key.

LISTSTOR

Screens (continued)

This screen lets you choose one of the following:

1. **Description of List Storage Information.** Choose 1 to get a description of LISTSTOR. The next screen you will see is screen 12-021.
2. **List Storage Information using Recommendations.** Choose 2 to get a fast printing of the storage information. If you choose 2, all storage information except the BASIC Program Listing is immediately printed on printer #10, the first printer. The next screen you will see is screen 12-092.
3. **List Storage Information.** Choose 3 to tell what storage information you want to be listed. If you choose 3, two more prompt screens are shown. The next screen you will see is screen 12-043.
4. **List Internal Representation of Storage.** Choose 4 to tell which storage locations you want to be listed. If you choose 4, two more prompt screens are shown. The next screen you will see is screen 12-044.
5. **Copy Storage Information from Disk to Diskette.** Choose 5 to copy to a diskette the System/23 storage information that you saved on the disk. The next screen you will see is screen 12-095.
6. **Copy Disk Storage Information to Diskette.** Choose 6 to copy disk storage information to a diskette. The next screen you will see is 12-096.
7. **List Internal Representation of Disk Storage.** Choose 7 to tell which disk storage locations you want to print of display. If you choose 7, two more prompt screens are shown. The next screen you will see is screen 12-047.

9. End List Storage Information. Choose 9 to end
LISTSOR. The next screen you will see displays the
READY INPUT status.

Type 1, 2, 3, 4, 5, 6, 7, or 9. (The first time this screen
appears, this field contains 2. If you do not type a value, then
2 is assumed.)

LISTSTOR

Screens (continued)

Screen 12-021 (Description of List Storage Information)

Description of List Storage Information

12-021

The following keys are used in all Customer Support Functions:

Enter - Press Enter to advance to the next screen when all requested information has been typed in.

? - If '? Help' appears on the screen, you can get more information by typing a ? in the first position of that field, and then pressing Enter.

Cmd 9 - If 'Cmd 9 Cancel' appears on the screen, and you wish to return to the menu, press and hold the Cmd key while pressing the 9 key on the numeric key pad. It is not necessary to press the Enter key.

Press Enter to continue

Cmd 9 Cancel

You see screen 12-021 after you choose 1 on screen 12-010, the List Storage Information Menu screen.

This screen tells you about keys used in all the Customer Support Functions. It describes:

1. How to use the Enter key
2. How to get help
3. How to cancel and start over

The next screen you will see is screen 12-031.

LISTSTOR

Screens (continued)

Screen 12-031 (Description of List Storage Information)

Description of List Storage Information

12-031

IMPORTANT: This Customer Support Function is used to format storage information written by the diagnostic monitor on to a file named STGDMP on a Basic exchange diskette. Do not try to run this Customer Support Function without the diskette. For further information refer to the Customer Support Functions manual for programmers.

There are five types of information that can be formatted: system features and status of the machine, status of the BASIC program being run, BASIC program variables and their values, status of all files opened by the BASIC program, and a listing of the BASIC program.

This Customer Support Function can also be used to list storage in internal representation.

Press Enter to return to menu

You see screen 12-031 after screen 12-021.

This screen tells you the types of storage information that can be listed.

The next screen you will see is screen 12-010, the List Storage Information Menu screen.

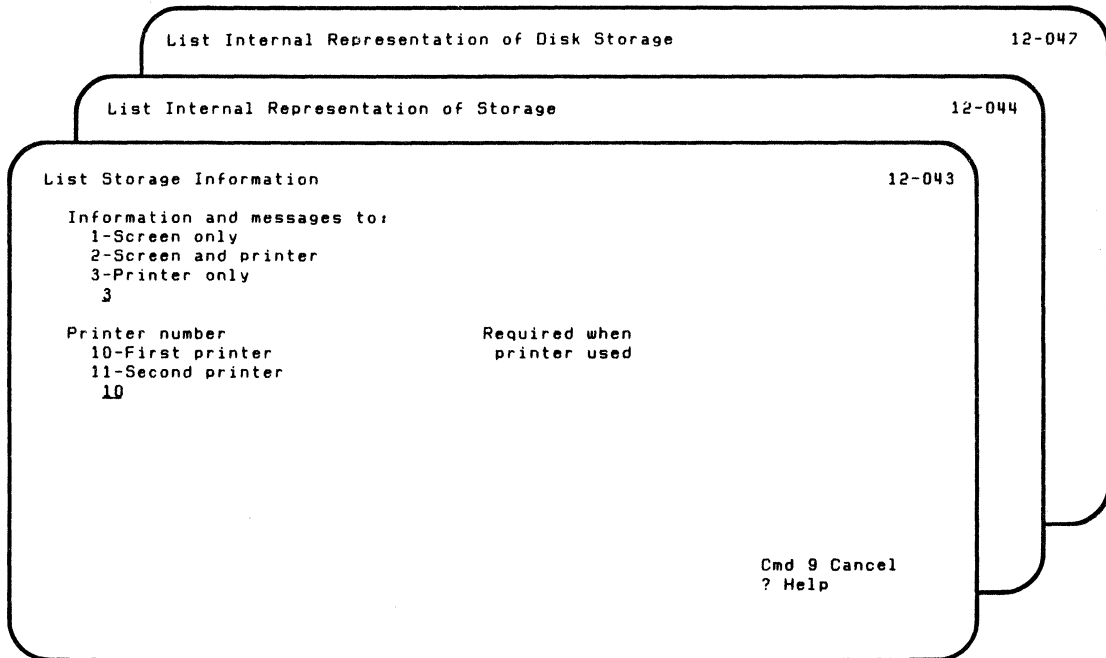
LISTSTOR

Screens (continued)

Screen 12-043 (List Storage Information)

Screen 12-044 (List Internal Representation of Storage)

Screen 12-047 (List Internal Representation of Disk Storage)



You see screen 12-043 after you choose 3 on screen 12-010, the List Storage Information Menu screen.

You see screen 12-044 after you choose 4 on screen 12-010, the List Storage Information Menu screen.

You see screen 12-047 after you choose 7 on screen 12-010, the List Storage Information Menu screen.

LISTSTOR

Screens (continued)

These screens ask you to tell where the information is to be shown.

Information and messages to:

1-Screen only. Choose 1 to show all information and messages only on the screen.

2-Screen and printer. Choose 2 to show all information and messages on both the screen and printer.

3-Printer only. Choose 3 to show all information and messages only on the printer.

Type 1, 2, or 3 in the space provided. (The first time this screen appears, this field contains 3. If you do not type a value, then 3 is assumed.)

Printer number:

10-First printer. Choose 10 to show all information and messages on the first printer.

11-Second printer. Choose 11 to show all information and messages on the second printer.

Type 10 or 11 in the space provided. (The first time this screen appears, this field contains 10. If you do not type a value, then 10 is assumed.)

After screen 12-043, the next screen you will see is screen 12-053.

After screen 12-044, the next screen you will see is screen 12-064.

LISTSTOR

Screens (continued)

Screen 12-053 (List Storage Information)

List Storage Information

12-053

Information desired:

- | | | |
|----|--|----------|
| 1. | System features
and status (Y,N)
Y | Required |
| | BASIC program | |
| 2. | Status (Y,N)
Y | Required |
| 3. | Variables (Y,N)
Y | Required |
| 4. | Open files (Y,N)
Y | Required |
| 5. | Listing (Y,N)
N | Required |

Cmd 9 Cancel
? Help

You see screen 12-053 after screen 12-043.

This screen asks you for the storage information you want to be listed.

1. **System features and status.** Choose Y to get the following information:

- Level of the system
- Amount of storage available on the machine
- Status of each diskette drive
- Status of each printer
- Station ID assigned to the machine
- Current program
- System variables
- Character set
- Shift state
- Machine updates that are loaded
- Part numbers

Type Y or N in the space provided. (The first time this screen appears, this field contains Y. If you do not type a value, then Y is assumed.)

LISTSTOR

Screens (continued)

2. **BASIC program status.** Choose Y to get the status of the BASIC program in execution at the time the storage information was written to the STGDMP file. The information includes:

- Name of the program loaded
- Last line that was executed
- Last error that occurred
- ON conditions set
- OPTIONS that have been set
- GOSUB information
- Procedure file information

Type Y or N in the space provided. (The first time this screen appears, this field contains Y. If you do not type a value, then Y is assumed.)

3. **BASIC variables.** Choose Y to get a listing of all the BASIC program variables and their values. The arrays are listed by subscript and value.

Type Y or N in the space provided. (The first time this screen appears, this field contains Y. If you do not type a value, then Y is assumed.)

4. **BASIC open files.** Choose Y to get information on all files opened by the BASIC program.

Type Y or N in the space provided. (The first time this screen appears, this field contains Y. If you do not type a value, then Y is assumed.)

5. **BASIC listing.** Choose Y to get a listing of the BASIC program in execution at the time the storage information was written to the STGDMP file (if it is not locked).

Type Y or N in the space provided. (The first time this screen appears, this field contains N. If you do not type a value, then N is assumed.)

The next screen you will see is screen 12-093.

LISTSTOR

Screens (continued)

Screen 12-064 (List Internal Representation of Storage)

List Internal Representation of Storage

12-064

Starting page number	Required
-	
Starting address	Required
—	
Ending page number	Required
-	
Ending address	Required
—	

Cmd 9 Cancel
? Help

You see screen 12-064 after screen 12-044.

This screen asks you to tell which storage locations you want to be listed.

Starting page number. This is the page number (0-6) of the beginning of the storage information area to be listed.

<i>Page number</i>	<i>Valid address range</i>
0	8000-FFFF
1-6	C000-FFFF

Type the page number in the space provided.

Starting address. This is the four-character internal representation (hexadecimal) address of the beginning of the storage information area to be listed.

<i>Machine storage size</i>	<i>Valid page range</i>
32K	0
64K	0-2
96K	0-4
128K	0-6

Type the address in the space provided.

Ending page number. This is the page number (0-6) of the end of the storage information area to be listed.

Type the page number in the space provided.

LISTSTOR

Screens (continued)

Ending address. This is the four-character internal representation (hexadecimal) address of the end of the storage information area to be listed.

Type the address in the space provided.

The next screen you will see is screen 12-084.

Screen 12-073 (List Storage Information)

List Storage Information

12-073

ID	Title	Information
1	System Features and Status	
1-01	System level	2.00
1-02	Storage size	64K
1-03	Diskette drives	DRIVE SIZE VOLID
		1 1 VOL001 NOT READY
		2 DRIVE NOT USED
1-04	Printers	*10 ACTIVE
		*11 NONE
1-05	Station identifier	11
1-06	Current program	BASIC Program
1-07	CNT	0
1-08	TIME*	00:11:15
1-09	DATE*	/ /
1-10	CODE	0
1-11	FILENUM	NONE

Press Enter to continue

Cmd 9 Cancel

You see screen 12-073 after screen 12-093.

This screen gives you the storage information you asked for.

Press the Enter key for more screens until all the storage information is completed.

LISTSTOR

Screens (continued)

List Storage Information

12-073

ID	Title	Information
3	BASIC Program Variables	
I		1
R		9.999999
A\$		DIM*18
A\$		a
MAXSTRG*		DIM*255
MAXSTRG*		abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZ
OPQRSTUVWXYZ		abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnop		qrstuvwxyzABCDEFGHIJKLMN
qrstuvwxyz		ABCDEFGHIJKLMN
ABCDEFGHIJKLMN		OPQRSTUVWXYZ
OPQRSTUVWXYZ		ABCDEFGHIJKLMN
INTARRAY		DIM(4,4)
INTARRAY(1,1)		0
INTARRAY(1,2)		1
INTARRAY(1,3)		2
INTARRAY(1,4)		3

Press Enter to continue

Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

List Storage Information

12-073

ID	Title	Information
4	BASIC Program Open Files	
4-01	File number	*141
4-02	File specification	PROC1/VSS001/1
4-03	Type of file	05
4-04	File organization	SEQUENTIAL
4-05	Record length	0
4-06	Access type	INPUT
4-07	Last record	0
4-08	Number of blocks used	1
4-13	PAGEFLOW	60

Press Enter to continue

Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

LISTSTOR

Screens (continued)

List Storage Information

12-073

ID	Title	Information
4-01	File number	#1
4-02	File specification	MASTER/LFD002/2
4-03	Type of file	04
4-04	File organization	KEYED
4-05	Record length	80
4-06	Access type	OUTIN
4-07	Last record	2
4-08	Number of blocks used	1
4-09	Key file	MASTER.INDEX/LFD002/2
4-10	Key	ab0defghij
4-11	Position of key	1
4-12	Length of key	10

Press Enter to continue

Cmd 9 Cancel

Press the Enter key for more screens until all the storage information is completed.

List Storage Information

12-073

ID Title

Information

5 BASIC Program Listing

```
00010 REM VARIABLES TEST
00020 OPTION BASE 1,COLLATE ALTERNATE,INVP,RD 15
00030 ON SOFLOW IGNORE
00040 ON OFLOW IGNORE
00050 ON ATTN GOTO EXITP
00060 ON ZDIV SYSTEM
00065 ON CONV GOTO 830
00070 LET I=1
00080 LET R=9.999999
00090 LET A$="a"
00100 DIM MAXSTRG$*255
00110 LET MAXSTRG$="abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnop
abcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyABCDEFGHI
JKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopghij
```

Press Enter to continue

Cmd 9 Cancel

The next screen you will see is screen 12-103 (if the display was successful) or screen 12-113 (if the display was not successful).

LISTSTOR

Screens (continued)

Screen 12-084 (List Internal Representation of Storage)

List Internal Representation of Storage

12-084

Address	Internal Representation	Graphic
Page Number 2		
FC90	C5 C4 40 40 40 40 40 40 40 40 40 40 40 40 40 40	ED
FCA0	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
FCB0	- FC00 Same as above	
FCE0	F0 F0 F7 F8 F0 40 D9 C5 C1 C4 40 7B F1 6B E4 E2	00780 READ *1,US
FCF0	C9 D5 C7 40 D9 C5 C3 C6 D6 D9 D4 6B D2 C5 E8 7E	ING RECFORM,KEY=

Press Enter to continue

Cmd 9 Cancel

You see screen 12-084 after screen 12-064.

The screen shows the address of the storage information, the internal (hexadecimal) representation of the information, and the graphic representation of the information.

Press the Enter key for more screens until all of the storage information is completed.

After screen 12-084, the next screen you will see is screen 12-104 (if the display was successful), or screen 12-114 (if the display was not successful).

LISTSTOR

Screens (continued)

Screen 12-087 (List Internal Representation of Disk Storage)

List Internal Representation of Disk Storage

12-087

Address	Internal Representation	Graphic
0000	E1 3E 00 F8 D1 3E 01 F8 6C 15 00 F8 B1 3E 03 F8	..8J..8Z..8f..8
0010	A1 3E 04 F8 91 3E 05 F8 81 3E 06 F8 71 3E 07 F8	~..8j..8a..8é..8
0020	61 3E 08 F8 51 3E 09 F8 41 3E 0A F8 31 3E 0B F8	/..8é..8 ..8...8
0030	21 3E 0C F8 11 3E 0D F8 01 3E 0E F8 F1 3D 0F F8	...8...8...81..8
0040	E1 3D 10 F8 D1 3D 11 F8 C1 3D 12 F8 B1 3D 13 F8	..8J..8A..8f..8
0050	A1 3D 14 F8 91 3D 15 F8 81 3D 16 F8 71 3D 17 F8	~..8j..8a..8é..8
0060	61 3D 18 F8 51 3D 19 F8 41 3D 1A F8 31 3D 1B F8	/..8é..8 ..8...8
0070	21 3D 1C F8 11 3D 1D F8 01 3D 1E F8 F1 3C 1F F8	...8...8...81..8
0080	E1 3C 20 F8 D1 3C 21 F8 C1 3C 22 F8 B1 3C 23 F8	..8J..8A..8f..8
0090	A1 3C 24 F8 91 3C 25 F8 81 3C 26 F8 71 3C 27 F8	~..8j..8a..8é..8
00A0	61 3C 28 F8 51 3C 29 F8 41 3C 2A F8 31 3C 2B F8	/..8é..8 ..8...8
00B0	21 3C 2C F8 11 3C 2D F8 01 3C 2E F8 F1 3B 2F F8	...8...8...81..8
00C0	E1 3B 30 F8 D1 3B 31 F8 C1 3B 32 F8 B1 3B 33 F8	..8J..8A..8f..8
00D0	A1 3B 34 F8 91 3B 35 F8 81 3B 36 F8 71 3B 37 F8	~..8j..8a..8é..8
00E0	61 3B 38 F8 51 3B 39 F8 41 3B 3A F8 31 3B 3B F8	/..8é..8 ..8...8
00F0	21 3B 3C F8 11 3B 3D F8 01 3B 3E F8 F1 3A 3F F8	...8...8...81..8

Press Enter to continue

Cmd 9 Cancel

You see screen 12-087 after screen 12-097.

The screen shows the address of the storage information, the internal (hexadecimal) representation of the information, and the graphic representation of the information.

Press the Enter key for more screens until all of the storage information is completed.

After screen 12-087, the next screen you will see is screen 12-107 (if the listing was successful), or screen 12-117 (if the listing was not successful).

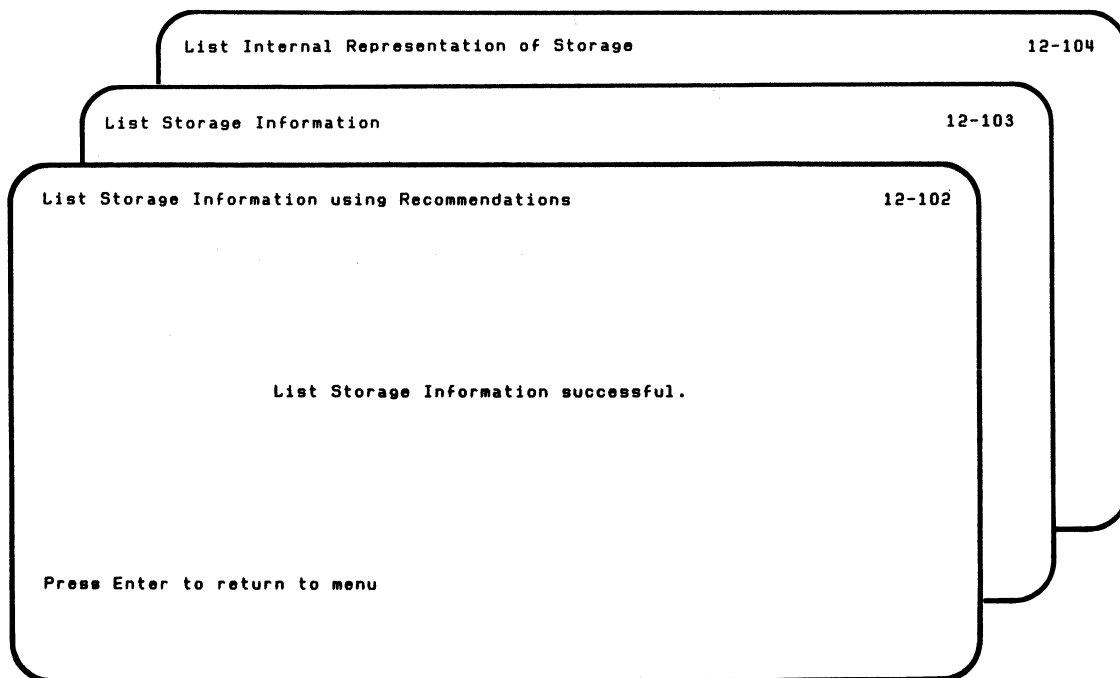
LISTSTOR

Screens (continued)

Screen 12-102 (List Storage Information Using Recommendations)

Screen 12-103 (List Storage Information)

Screen 12-104 (List Internal Representation of Storage)



You see screen 12-102 after screen 12-092 if the listing of the storage information is successful.

You see screen 12-103 after screen 12-073 if the listing of the storage information is successful.

You see screen 12-104 after screen 12-084 if the listing of the storage information is successful.

These screens show you successful completion of LISTSTOR.

The next screen you will see is screen 12-010, the List Storage Information Menu screen.

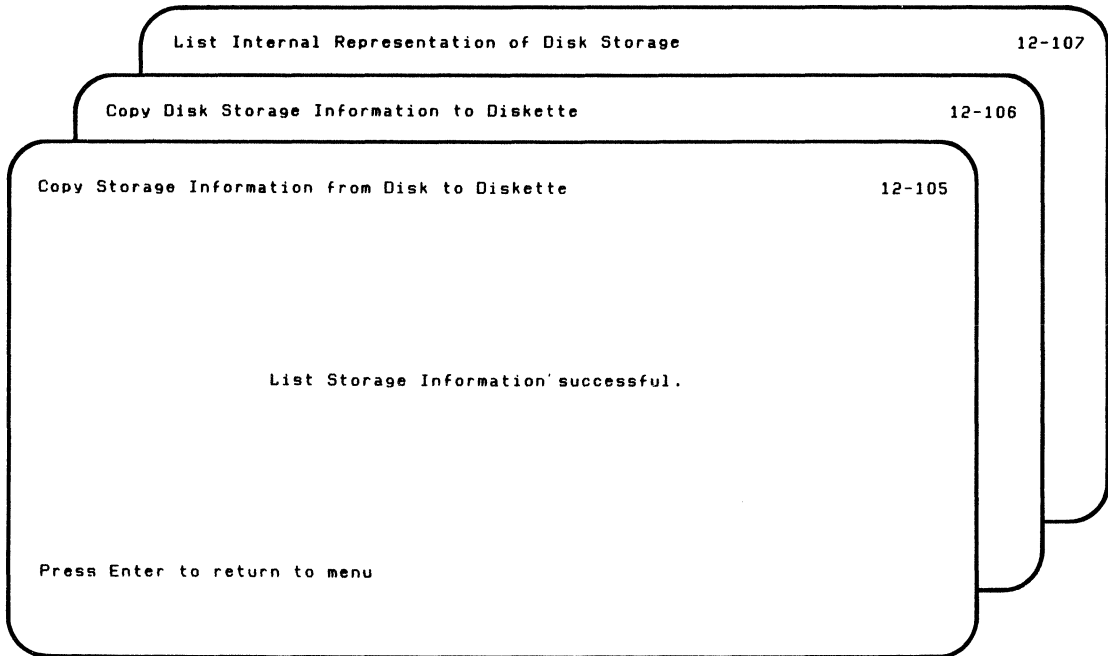
LISTSTOR

Screens (continued)

Screen 12-105 (Copy Storage Information from Disk to Diskette)

Screen 12-106 (Copy Disk Storage Information to Diskette)

Screen 12-107 (List Internal Representation of Disk Storage)



You see screen 12-105 after screen 12-095 if the listing of the storage information is successful.

You see screen 12-106 after screen 12-096 if the listing of the storage information is successful.

You see screen 12-107 after screen 12-087 if the listing of the storage information is successful.

LISTSTOR

Screens (continued)

Screen 12-127 (List Internal Representation of Disk Storage)

List Internal Representation of Disk Storage	12-127
Starting address	Required

Ending address	Required

	Cmd 9 Cancel ? Help

You see screen 12-127 after screen 12-047.

Starting address. This is the four-character internal representation (hexadecimal) address of the beginning of the storage information area to be listed. The address range is 0000 to FFFF.

Ending address. This is the four-character internal representation (hexadecimal) address of the end of the storage information area to be listed. The address range is 0000 to FFFF.

Chapter 8. LISTDISK

Introduction

Note: LISTDISK is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

The List Information (LISTDISK) Customer Support Function lets you list information about disk volumes and diskettes and their files. Much of the information that can be listed is similar to that provided by the DIR command, except that LISTDISK gives more information (for example, create and update dates) and is capable of file selection. The files are listed in alphabetic order to help you look through the filenames.

At your request, it gives a display of the diskette information on drive 1 without any prompts, or it uses your answers to prompts to list information about specific files or specific disk volumes or diskettes.

You should run this program when your IBM representative directs you to run LISTDISK. However, you may also run this program any time you want detailed information about the characteristics of disk volumes, diskettes, and files.

LISTDISK

Functions of LISTDISK

LISTDISK can be used to list information about disk volumes, diskettes, and files. If you wish, you can ask for a listing of each of the following:

- All files in diskette drive 1
- All files
- All open files
- All freed files
- One or a group of files
- One file type

Running LISTDISK

Note: LISTDISK is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk.

Before you begin

You need these items before you start LISTDISK

- The LISTDISK Customer Support Function
- The VOLID of the disk volume or the diskette that contains your files to be listed

Operating considerations

As you type your choices to be listed, the values you type are saved by LISTDISK. In this way, if you wish to list more disk volumes or diskettes using the same choices, you can rapidly go through the option screens by pressing Enter for each screen.

Files that have duplicate data set labels are indicated by a colon (:) preceding the filename. Duplicate data set labels are never displayed.

Diskettes with Basic or H Exchange format cannot be used with the following choices:

- List information for open files
- List information for freed files
- List information by file type

For access-protected disk volumes or diskettes, OWNERIDs and file information are not provided.

LISTDISK

Examples using LISTDISK

Note: LISTDISK is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

Four examples follow. The first example asks for information for a specific file. The second example asks for information for all freed file labels. The third example does not go through sequential steps, but merely shows an output screen when a file label is not readable. The fourth example asks for information about a specific disk volume.

Example 1. Listing information for one file

Suppose you have a file named FILE5 on a diskette. You want to get information about the file.

1. Insert the Customer Support Functions diskette that contains LISTDISK
2. Type: LINK LISTDISK
3. Press: Enter key.

You will see the List Information Menu screen. Choose 6, as indicated, to get information for one file.

List Information Menu

14-010

Choose one of the following:

1. Description of List Information
2. Display all drive 1 diskette information
3. List all diskette or disk information
4. List information for open files
5. List information for freed files
6. List information by file name
7. List information by file type

9. End List Information

Choice

6

Press the Enter key.

LISTDISK

Examples using LISTDISK (continued)

The next screen asks for information about the file to be listed. Type FILE5, as indicated, and insert the diskette containing FILE5 into drive 1.

List Information by File Name		14-036
Filename	Required	
FILE5		
VOLID	Optional when drive number provided	
Drive number	Optional when VOLID provided	
1		
		Cmd 9 Cancel ? Help

Press the Enter key.

The next screen asks where the information is to be shown. Since you want the information to be shown on the screen, choose 1 as indicated.

Note: Since the information will not be printed, the printer number is ignored.

List Information by File Name

(14-056

Information and messages to:

1-Screen only
2-Screen and printer
3-Printer only
1

Printer number	Required when printer used
10-First printer	
11-Second printer	
10	

Cmd 9 Cancel
? Help

Press the Enter key.

LISTDISK

Examples using LISTDISK (continued)

The next screen gives you information about file FILE5.

For example:

- The colon (:) preceding FILE5 in column L shows that FILE5 has a duplicate data set label that can be used by the RECOVER Customer Support Function.
- The zeroes in columns V (create date) and W (update date) show that the DATA function was not set when the file was created.
- The 3 in column T shows that the file is open for input only (ISI) by station 2. (Columns A through W are explained under "Screens" on page 8-23.)

```
List Information by File Name
A      B      C      D      E      F      G      H      I      J      K
DIR1   JOHNSON  1      0      0      1      60     6      512    0     - 130

L      M      N      O      P      Q      R      S      T      U      V      W
:FILE5  54     64     7      1     ----  0 304  0300  0000  00/00/00  00/00/00
```

Press Enter to continue

Cmd 9 Cancel

The next screen shows successful completion of LISTDISK.

List Information by File Name

14-076

List Information successful.

Press Enter to return to menu

LISTDISK

Examples using LISTDISK (continued)

Note: LISTDISK is on diskette VOL002.

Note: If you have the 5247 Disk Unit, your Customer Support Functions are on your disk. This means that you will not have to insert or remove a Customer Support Functions diskette. Start with step 2.

Example 2. Listing information for freed files

Suppose you want to find out how large is the work file built by the SORT Customer Support Function before you add any new files to a diskette.

1. Insert the Customer Support Functions diskette that contains LISTDISK
2. Type: LINK LISTDISK
3. Press: Enter key

You will see the List Information Menu screen. Choose 5, as indicated, to get information for the freed files.

List Information Menu

14-010

Choose one of the following:

1. Description of List Information
2. Display all drive 1 diskette information
3. List all diskette or disk information
4. List information for open files
5. List information for freed files
6. List information by file name
7. List information by file type

9. End List Information

Choice
5

Press the Enter key.

LISTDISK

Examples using LISTDISK (continued)

The next screen asks for information about the diskette to be listed. Insert the diskette that contains the work file into drive 1.

List Information for Freed File Labels

14-025

VOLID _____ Optional when
drive number provided

Drive number 1 Optional when
VOLID provided

Cmd 9 Cancel
? Help

Press the Enter key.

The next screen asks where the information is to be shown. Since you want the information to be shown on the screen, choose 1 as indicated.

Note: Since the information will not be printed, the printer number is ignored.

List Information for Freed File Labels

14-055

Information and messages to:

1-Screen only
2-Screen and printer
3-Printer only
1

Printer number	Required when printer used
10-First printer	
11-Second printer	
10	

Cmd 9 Cancel
? Help

Press the Enter key.

LISTDISK

Examples using LISTDISK (continued)

The next screen gives you the information about the freed files on the diskette you inserted in drive 1.

For example:

- SORT.WORK41 shows that a work file was used for a sort run on 81/02/19.
- The work file required 147 sectors.
- Since columns D (bad cylinders), E (error count), and J (bad sectors) are 0, the diskettes and drives are in good condition. (Columns A through W are explained under "Screens" on page 8-23.)

```
List Information for Freed File Labels      82/02/23  03:21:51  14-065
A      B      C      D      E      F      G      H      I      J      K
TSTDIR WJOHNSON      2D      0      0      1      100     24     512     0     - 976

L      M      N      O      P      Q R S      T      U      V      W
FSP10      -----      15      1 ---- 0 205 0000 0000 81/02/06 81/02/06
FSP11      -----      15      1 ---- 0 205 0000 0000 81/02/06 81/02/06
SORT.WORK41      0 25 147      1 ---- 0 104 0000 0000 81/02/19 81/02/19
```

Press Enter to continue

Cmd 9 Cancel

Press the Enter key.

The next screen shows successful completion of LISTDISK.

List Information for Freed File Labels

14-075

List Information successful.

Press Enter to return to menu

LISTDISK

Examples using LISTDISK (continued)

Example 3. An output screen containing an error

Following is an example of an output screen when a file label is found to be unreadable. The error message appears first because of the sorting function provided by LISTDISK:

- The first number in the error message is the position of the file label in the directory. In this example, the fifth file label was defective.
- The second number is the error number that describes the defect. In this example, the error number is 6006.

```
Display all Drive 1 Diskette Information          81/03/30 02:06:31 14-062
A          B          C          D          E          F          G          H          I          J          K
REC1     FBD          1          1          35         1          18         12         512        0         - 374

L          M          N          O          P          Q          R          S          T          U          V          W
  5 6006 ERROR OCCURRED WHEN READING FILE LABEL
DCOPY          145 128  37  1 ---- 0 110 0000 0000 00/00/00 00/00/00
DCOPY1          51 128  20  1 ---- 0 110 0000 0000 00/00/00 00/00/00
DCOPY2          15 128  20  1 ---- 0 110 0000 0000 00/00/00 00/00/00
DCOPY3           4 128  20  1 ---- 0 110 0000 0000 00/00/00 00/00/00
READ.RECOVERY.F03 ----- 1  1 ---- 0 205 0000 0000 00/00/00 00/00/00
```

Press Enter to continue

Cmd 9 Cancel

Example 4. Listing information for a disk volume

Suppose you want to get information about your disk volume, HARDIN.

Note: The LISTDISK Customer Support Function is on your disk.

1. Type: LINK LISTDISK
2. Press: Enter key

LISTDISK

Examples using LISTDISK (continued)

You will see the List Information Menu screen. Choose 3, as indicated, to get information regarding a disk volume.

List Information Menu

14-010

Choose one of the following:

1. Description of List Information
2. Display all drive 1 diskette information
3. List all diskette or disk information
4. List information for open files
5. List information for freed files
6. List information by file name
7. List information by file type

9. End List Information

Choice

3

Press the Enter key.

The next screen asks for information about the disk volume to be listed.

If you do not enter a VOLID when drive 5 is specified, the computer lists the *first* volume on your disk.

List All Diskette or disk information

14-023

VOLID	Optional when
hardio	drive number provided
Drive number	Optional when
5	VOLID provided

Cmd 9 Cancel
? Help

Press the Enter key.

LISTDISK

Examples using LISTDISK (continued)

The next screen asks where the information is to be shown. Since you want the information to be shown on the screen, choose 1 as indicated.

Note: Since the information will not be printed, the printer number is ignored.

List All Diskette or disk information

14-053

Information and messages to:

- 1-Screen only
- 2-Screen and printer
- 3-Printer only
- 1

Printer number

- 10-First printer
- 11-Second printer
- 10

Required when
printer used

Cmd 9 Cancel
? Help

Press the Enter key

The next screen gives you information about disk volume HARDIN.

Columns A through W are explained under "Screens" on page 8-23.

If a field does not contain information, it means that the field does not apply to the type of information you are listing.

```
List All Diskette or disk information                82/02/03 10:21:14 14-063
A      B      C      D      E      F      G      H      I      J      K
HARDIN OWNERID  --      -      -----      1      98      93      512  -----  -----

L      M      N      O      P      Q      R      S      T      U      V      W
APARSRT      3  128      1      1  -----  0  304  0000  0000  00/00/00  00/00/00
NUM2      -----      1      17      1      1  0  207  0000  0000  00/00/00  00/00/00
WIN      1500  496  1460      1  -----  0  304  0000  0000  00/00/00  00/00/00
WIN2      1500  496  1457      1  -----  0  304  0000  0000  00/00/00  00/00/00
WIN3      9      10      28      1  -----  0  304  0000  0000  00/00/00  00/00/00
```

Press Enter to continue

Cmd 9 Cancel

Press the Enter key.

LISTDISK

Examples using LISTDISK (continued)

The next screen shows successful completion of LISTDISK.

List All Diskette or disk information

14-073

List Information successful.

Press Enter to return to menu

Screens

This section contains the screens that can appear while you are running LISTDISK. They are shown in numeric order by screen number, starting with the lowest screen number, so that you can quickly find the screen you want.

The order of screens in this section is not the order in which they appear while you are running LISTDISK. The order depends on the choices you select on the menu and your answers to certain prompts.

LISTDISK

Screens (continued)

Screen 14-010 (List Information Menu)

List Information Menu

14-010

Choose one of the following:

1. Description of List Information
2. Display all drive 1 diskette information
3. List all diskette or disk information
4. List information for open files
5. List information for freed files
6. List information by file name
7. List information by file type

9. End List Information

Choice

2

You see screen 14-010 after you type LINK LISTDISK and press the Enter key.

This screen lets you choose one of the following:

1. **Description of List Information.** Choose 1 to get a description of LISTDISK. The next screen you see is screen 14-091.
2. **Display all drive 1 diskette information.** Choose 2 to get a fast display of all the diskette information. If you choose 2, you must insert your diskette into drive 1 before pressing Enter; all files on drive 1 are immediately shown on the screen. The next screen you see is 14-062.
3. **List all diskette or disk information.** Choose 3 to get a listing of all files of a specific disk volume or diskette. This choice gives the same information as choice 2, but it lets you specify the drive number or VOLID, and where the information is to be shown. The next screen you see is screen 14-023.
4. **List information for open files.** Choose 4 to get a listing of all open files of a specific disk volume or diskette.

If a diskette is not in System/23 format, an error occurs. The next screen you see is screen 14-024.

5. **List information for freed files.** Choose 5 to get a listing of all freed files of a specific disk volume or diskette. All information for the file is shown as it was when the file was freed.

If a diskette is not in System/23 format, an error occurs. The next screen you see is screen 14-025.

6. **List information by filename.** Choose 6 to get a listing of one or more files that have the same prefix in the first portion of the filename. The next screen you see is screen 14-036.
7. **List information by file type.** Choose 7 to get a listing of all files of a specific type.

LISTDISK

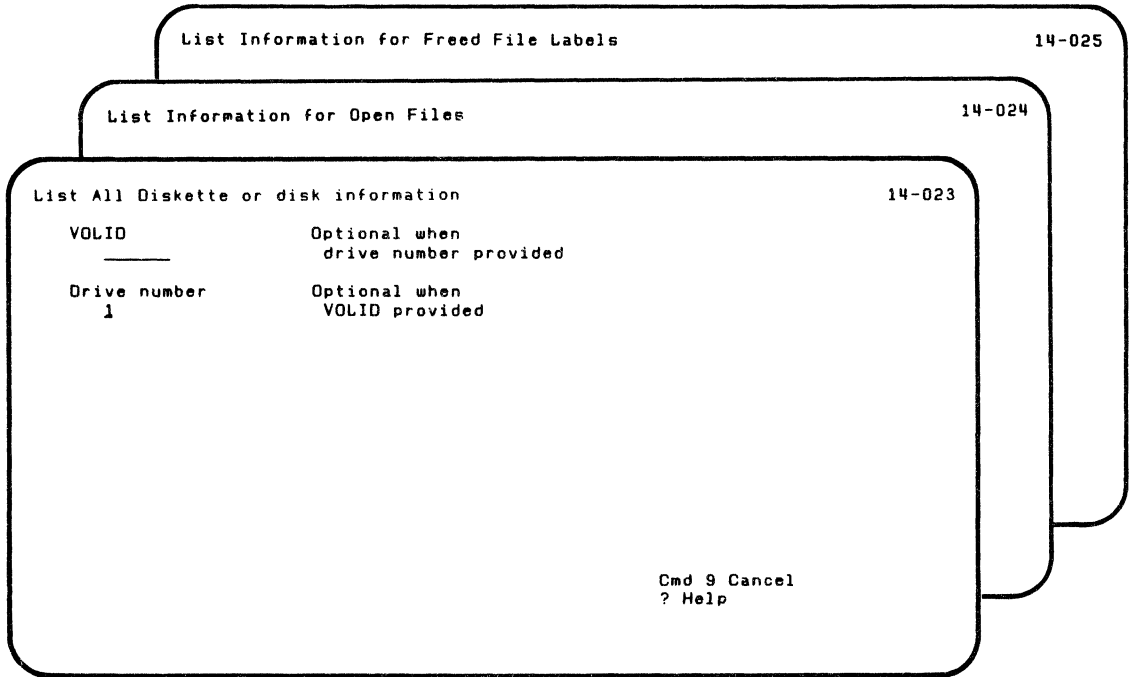
Screens (continued)

If a diskette is not in System/23 format, an error occurs. The next screen you see is screen 14-047.

- 9. End List Information.** Choose 9 to end LISTDISK. The next screen displays the READY INPUT status.

Type 1, 2, 3, 4, 5, 6, 7, or 9.

Screen 14-023 (List All Diskette or DISK Information)
Screen 14-024 (List Information for Open Files)
Screen 14-025 (List Information for Freed File Labels)



LISTDISK

Screens (continued)

You see screen 14-023 after you choose 3 on screen 14-010, the List Information Menu screen.

You see screen 14-024 after you choose 4 on screen 14-010, the List Information Menu screen.

You see screen 14-025 after you choose 5 on screen 14-010, the List Information Menu screen.

These screens ask you for information about the disk volume or diskette to be listed.

VOLID. This is the name of the disk volume or diskette that contains the files to be listed.

Type the name in the space provided. (If a name is not provided in this field, then a drive number must be provided in the following field.)

If you do not enter a VOLID when your drive number is 5 (disk), the computer will list the *first* volume on your disk.

Drive number. This is the number of the drive that contains the file to be listed.

Type the number in the space provided. (If a number is not provided in this field, then a VOLID name must be provided in the previous field.)

After screen 14-023, the next screen you see is screen 14-053.

After screen 14-024, the next screen you see is screen 14-054.

After screen 14-025, the next screen you see is screen 14-055.

LISTDISK

Screens (continued)

Screen 14-036 (List Information by File Name)

List Information by File Name		14-036
Filename _____	Required	
VOLID _____	Optional when drive number provided	
Drive number 1	Optional when VOLID provided	
		Cmd 9 Cancel ? Help

You see screen 14-036 after you choose 6 on screen 14-010, the List Information Menu screen.

This screen asks you for information about the disk volume or diskette and the files to be listed.

Filename. This is the name of the file to be listed.

- If a name is typed, the information for that file will be shown.
- If a prefix followed by * is typed, the information for all filenames starting with that prefix will be shown. (For example, if you typed ABC*, all files whose names begin with ABC will be shown.)
- If * is typed, information for all files will be shown.

Type the name in the space provided.

VOLID. This is the name of the disk volume or diskette that contains the file to be listed.

If you do not enter a VOLID when your drive number is 5 (disk), the computer will list information on the first file it finds with the filename you specified. The computer starts the search from the *first* volume on your disk.

Type the name in the space provided.

Drive number. This is the number of the drive that contains the file to be listed.

Type the number in the space provided.

The next screen you see is screen 14-056.

LISTDISK

Screens (continued)

Screen 14-047 (List by File Type)

List Information by File Type		14-047
File Type	Required	
04		
VOLID	Optional when drive number provided	

Drive number	Optional when VOLID provided	
1		
		Cmd 9 Cancel ? Help

You see screen 14-047 after you choose 7 on screen 14-010, the List Information Menu screen.

This screen asks you for information about the disk volume or diskette to be listed.

File type. This is the two-digit number (for example, 04) identifying the file type. (See file types in *BASIC Language Reference* manual.)

Type the number in the space provided.

VOLID. This is the name of the disk volume or diskette that contains the file to be listed.

Type the name in the space provided. (If a name is not provided in this field, then a drive number must be provided in the following field.)

If you do not enter a VOLID when your drive number is 5 (disk), the computer will list the *first* volume on your disk.

Drive number. This is the number of the drive that contains the file to be listed.

Type the number in the space provided. (If a number is not provided in this field, then a VOLID name must be provided in the previous field.)

The next screen you see is screen 14-057.

LISTDISK

Screens (continued)

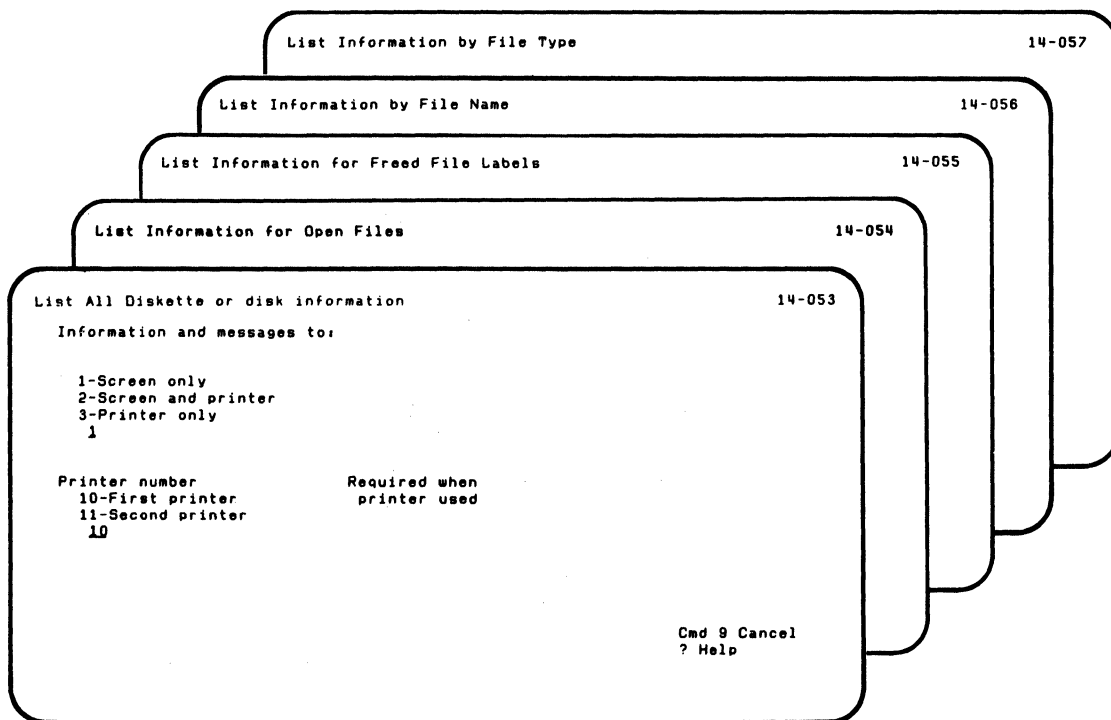
Screen 14-053 (List All Diskette or Disk Information)

Screen 14-054 (List Information for Open Files)

Screen 14-055 (List Information for Freed File Labels)

Screen 15-056 (List Information by File Name)

Screen 14-057 (List Information by File Type)



You see screen 14-053 after screen 14-023.

You see screen 14-054 after screen 14-024.

You see screen 14-055 after screen 14-025.

You see screen 14-056 after screen 14-026.

You see screen 14-057 after screen 14-047.

These screens ask you to tell where the information is to be shown or printed.

Information and messages to:

1-Screen only. Choose 1 to show all information and messages only on the screen.

2-Screen and printer. Choose 2 to show all information and messages on both the screen and printer.

3-Printer only. Choose 3 to show all information and messages only on the printer.

Type 1, 2, or 3 in the space provided. (The first time this screen appears, this field contains 1. If you do not type a value, then 1 is assumed.)

Printer number:

10-First printer. Choose 10 to show all information and messages on the first printer.

LISTDISK

Screens (continued)

11-Second printer. Choose 11 to show all information and messages on the second printer.

Type 10 or 11 in the space provided. (The first time this screen appears, this field contains 10. If you do not type a value, then 10 is assumed.)

After screen 14-053, the next screen you will see is screen 14-063.

After screen 14-054, the next screen you will see is screen 14-064.

After screen 14-055, the next screen you will see is screen 14-065.

After screen 14-056, the next screen you will see is screen 14-066.

After screen 14-057, the next screen you will see is screen 14-067.

Screen 14-062 (Display All Drive 1 Diskette Information)

Screen 14-063 (List All Diskette or Disk Information)

Screen 14-064 (List Information for Open Files)

Screen 14-065 (List Information for Freed File Labels)

Screen 14-066 (List Information by File Name)

Screen 14-067 (List Information by File Type)

List Information by File Type

81/03/30 15:30:54 14-067

List Information by File Name

81/03/30 15:29:44 14-066

List Information for Freed File Labels

81/03/30 15:28:59 14-065

List Information for Open Files

81/03/30 15:28:09 14-064

List All Diskette or disk information

81/03/30 15:26:41 14-063

```
Display all Drive 1 Diskette Information      82/02/23 03:34:01 14-062
A      B      C      D      E      F      G      H      I      J      K
TS*DIR WJOHNSON      2D      0      0      1      100      24      512      0      - 976

L      M      N      O      P      Q      R      S      T      U      V      W
CLM3000      3000      127      750      1      ----      0      304      0000      0000      81/03/30      81/03/30
CNT3000      4      128      2      2      ----      0      304      0000      0000      81/03/30      81/03/30
CS      ----      ----      1      1      ----      0      205      0000      0000      81/02/06      81/02/06
FILE.OUT      3000      3      18      1      ----      0      104      0000      0000      81/02/19      81/02/19
FSP1      ----      ----      1      1      ----      0      205      0000      0000      81/02/06      81/02/06
FSP12      ----      ----      15      1      ----      0      205      0000      0000      81/02/06      81/02/06
FSP13      ----      ----      15      1      ----      0      205      0000      0000      81/02/06      81/02/06
FSP2      ----      ----      2      1      ----      0      205      0000      0000      81/02/06      81/02/06
FSP3      ----      ----      1      1      ----      0      205      0000      0000      81/02/06      81/02/06
FSP4      ----      ----      3      1      ----      0      205      0000      0000      81/02/06      81/02/06
FSP5      ----      ----      3      1      ----      0      205      0000      0000      81/02/06      81/02/06
GNS      ----      ----      1      1      ----      0      205      0000      0000      81/02/06      81/02/06
GV5      ----      ----      1      1      ----      0      205      0000      0000      81/02/06      81/02/06
NS      ----      ----      1      1      ----      0      205      0000      0000      81/02/06      81/02/06
SPEC      ----      ----      3      1      ----      0      205      0000      0000      81/02/06      81/02/06
SPEC0      ----      ----      3      1      ----      0      205      0000      0000      81/02/06      81/02/06
V5      ----      ----      1      1      ----      0      205      0000      0000      81/02/06      81/02/06
Press Enter to continue                      Cmd 9 Cancel
```

LISTDISK

Screens (continued)

You see screen 14-062 after you choose 2 on screen 14-010 the List Information Menu screen.

You see screen 14-063 after screen 14-053.

You see screen 14-064 after screen 14-054.

You see screen 14-065 after screen 14-055.

You see screen 14-066 after screen 14-056.

You see screen 14-067 after screen 14-057.

These screens give you the information you asked for:

- A. Volume Name.** The name of the disk volume or diskette.
- B. Volume Owner.** The name of the owner of the disk volume or diskette.
- C. Diskette Type.** The type of diskette:
 - 1 Single-sided and single density
 - 2 2-sided and single density
 - 2D 2-sided and double density
- D. Bad Cylinders.** The number of bad cylinders (0, 1, or 2).
- E. Error Count.** The number of error entries in the error log sector. As this number increases from 0, it is increasingly likely that diskette-media defects or diskette drive problems have occurred. However, a small nonzero error

count may be normal, and should not always be thought of as a problem.

F. Disk Format. The format of the diskette:

1 System/23 format

2 Other than System/23 format

G. Total Labels. For a diskette, the number of labels established when the diskette was initialized. This number is the maximum number of files that can exist on the diskette.

For the disk, the current number of labels in the disk volume. As long as disk space is available, this number will increase as files are added to the volume. The maximum number of labels (files) for a disk volume is 9998.

H. Unused Labels. The number of labels available for more files.

I. Sector Size. The number of bytes in each physical sector.

J. Bad Sectors. The number of sectors that are bad and unavailable for use. This value does not include sectors on bad tracks.

K. Unused Sectors. The number of sectors available for additional data.

L. File Name. The name of the file. The name is preceded by a colon (:) if the file has a duplicate data set label. The files are listed in sorted order.

M. Record Count. The number of records in the file, including deleted records. (This value is not listed for key files or variable length files.)

LISTDISK

Screens (continued)

- N Record/Key Length.** The length of each record, not including the delete byte. For key files, the key length is shown. (This value is not listed for variable length files.)
- O. Allocation (Sectors).** The number of data blocks (sectors) reserved for the file.
- P. Extents.** The number of separate data areas on the disk volume or diskette reserved for the file.
- Q. Key Position.** The starting position of the key field in the master file. (This value is listed only for key files.)
- R. Write Protect.** A 1-digit number identifying if the file can be used for output.

1 File cannot be opened for output

0 File can be opened for output

- S. Record and File Type.** For a diskette in System/23 format or a disk volume, a 3-digit number identifying the record and file type.

First digit: 1 - fixed length record without a control byte;
2 - variable length record; 3 - fixed length record with a control byte.

Second and third digits: file type.

If a diskette is not in System/23 format, a single character identifies the format

B Basic Exchange

H H Exchange

E E Exchange

For further information on file types, see "File types" in *BASIC Language Reference*.

- T. Open Status.** A 4-digit number identifying the open status. The first digit on the left applies to station 1, the second digit to station 2, the third digit to station 3, and the last digit to station 4. The value of each digit can be:

0 Closed

1 Open for input, and will allow opens for input and output (ISH)

2 Open for input, and will allow opens for input only (ISI)

3 Open for output, and will allow opens for input only (OSH)

4 Open for output, and will allow opens for input only (OSI)

5 Open for no sharing (NS)

6 Open for output, and will allow opens for input and output (OSU)

7 Open for input, and will allow opens for input and output (OSU)

For further information on ISH, ISI, OSH, OSI, NS, or OSU, see "File sharing" in *BASIC Language Reference*.

- U. Reserve Status.** A 4-digit number identifying the reserve status. The first digit on the left applies to station 1, the second digit to station 2, the third digit to station 3, and the last digit to station 4. The values specified in the

LISTDISK

Screens (continued)

reserve status apply only to the other station. The value of each digit can be:

- 0 Not reserved
- 1 Allows opens for input and output (ISH)
- 2 Allows opens for input only (ISI)
- 3 Allows opens for input only (OSH)
- 4 Allows opens for input only (OSI)
- 5 Allows no opens (NS)
- 6 Allows opens for input and output (OSU)
- 7 Allows opens for input and output (OSU)

For further information on ISH, ISI, OSH, OSI, NS or OSU, see "File sharing" in *BASIC Language Reference*.

- V. Create Date.** Date that file was created.
- W. Update Date.** Date that file was updated.

After screen 14-062, the next screen you will see is screen 14-072 (if the list was successful) or screen 14-082 (if the list was not successful).

After screen 14-063, the next screen you will see is screen 14-073 (if the list was successful) or screen 14-083 (if the list was not successful).

After screen 14-064, the next screen you will see is screen 14-074 (if the list was successful) or screen 14-084 (if the list was not successful).

After screen 14-065, the next screen you will see is screen 14-075 (if the list was successful) or screen 14-084 (if the list was not successful).

After screen 14-066, the next screen you will see is screen 14-076 (if the list was successful) or screen 14-085 (if the list was not successful).

After screen 14-067, the next screen you will see is screen 14-077 (if the list was successful) or screen 14-087 (if the list was not successful).

LISTDISK

Screens (continued)

Screen 14-072 (Display All Drive 1 Diskette Information)

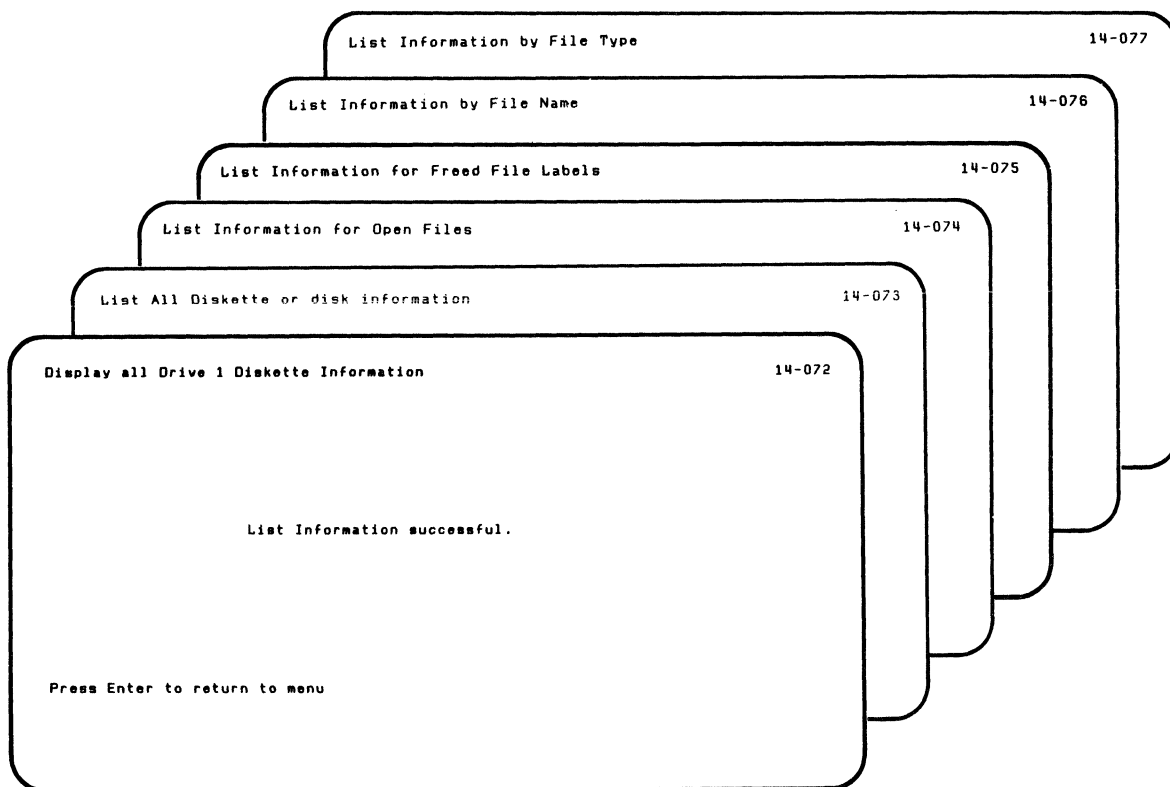
Screen 14-073 (List All Diskette or Disk Information)

Screen 14-074 (List Information for Open Files)

Screen 14-075 (List Information for Freed File Labels)

Screen 14-076 (List Information by File Name)

Screen 14-077 (List Information by File Type)



You see screen 14-072 after screen 14-062 if the listing of the information is successful.

You see screen 14-073 after screen 14-063 if the listing of the information is successful.

You see screen 14-074 after screen 14-064 if the listing of the information is successful.

You see screen 14-075 after screen 14-065 if the listing of the information is successful.

You see screen 14-076 after screen 14-066 if the listing of the information is successful.

You see screen 14-077 after screen 14-067 if the listing of the information is successful.

These screens show you successful completion of LISTDISK.

The next screen you will see is screen 14-010, the List Information Menu screen.

LISTDISK

Screens (continued)

Screen 14-082 (Display All Drive 1 Diskette Information)

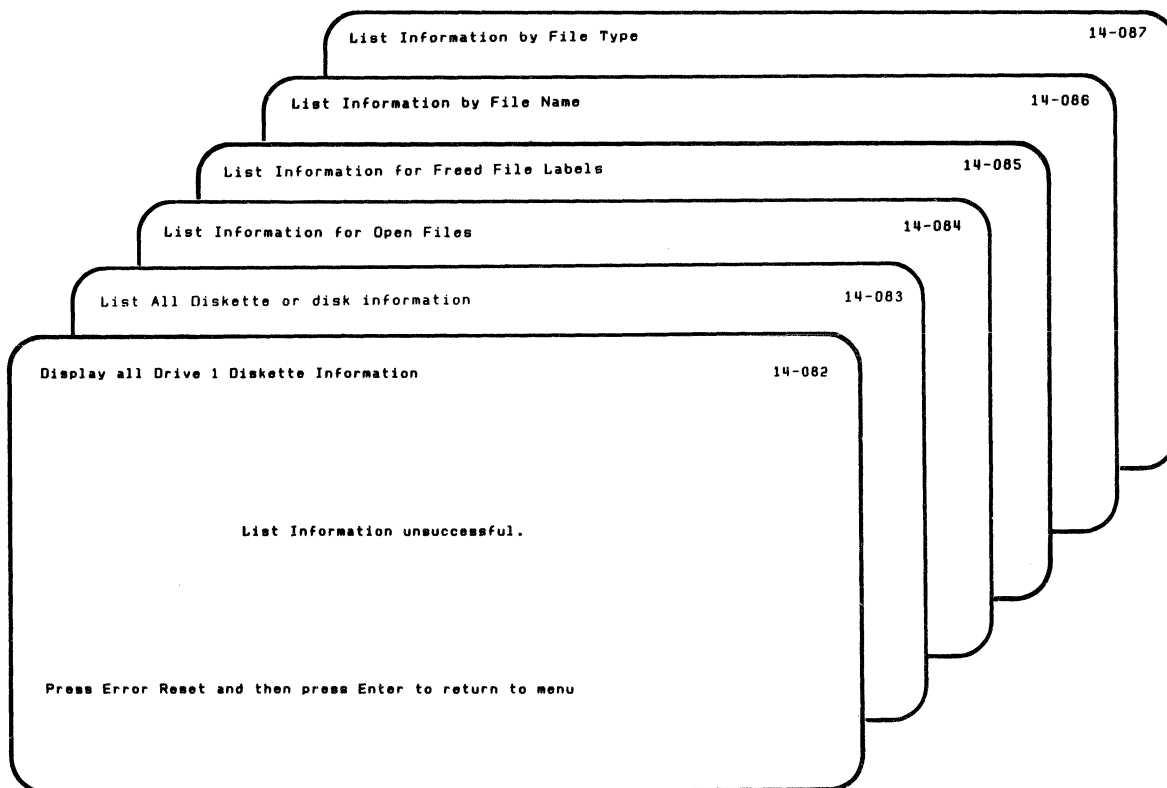
Screen 14-083 (List All Diskette or Disk Information)

Screen 14-084 (List Information for Open Files)

Screen 14-085 (List Information for Freed File Labels)

Screen 14-086 (List Information by File Name)

Screen 14-087 (List Information by File Type)



You see screen 14-082 after screen 14-062 if the listing of the information is not successful.

You see screen 14-083 after screen 14-063 if the listing of the information is not successful.

You see screen 14-084 after screen 14-064 if the listing of the information is not successful.

You see screen 14-085 after screen 14-065 if the listing of the information is not successful.

You see screen 14-086 after screen 14-066 if the listing of the information is not successful.

You see screen 14-087 after screen 14-067 if the listing of the information is not successful.

These screens show you unsuccessful completion of LISTDISK.

When you see these screens, the action and error codes are shown on the status line. Use these codes to correct the problem.

The next screen you will see is screen 14-010, the List Information Menu screen.

LISTDISK

Screens (continued)

Screen 14-091 (Description of List Information)

Description of List Information

14-091

The following keys are used in all Customer Support Functions:

Enter - Press Enter to advance to the next screen when all requested information has been typed in.

? - If '? Help' appears on the screen, you can get more information by entering a ? in the first position of that field, and then pressing Enter.

Cmd 9 - If 'Cmd 9 Cancel' appears on the screen, and you wish to return to the menu, press and hold the Cmd key while pressing the 9 key on the numeric key pad. It is not necessary to press the Enter key.

Press Enter to continue

Cmd 9 Cancel

You see screen 14-091 after you choose 1 on screen 14-010 the List Information Menu screen.

This screen tells you about keys used in all the Customer Support Functions. It describes:

- How to use the Enter key
- How to get help
- How to cancel and start over

The next screen you will see is screen 14-101.

LISTDISK

Screens (continued)

Screen 14-101 (Description of List Information)

Description of List Information

14-101

Volume Information listed for a diskette or disk includes:

- | | |
|------------------|-------------------|
| A. Volume Name | G. Total Labels |
| B. Volume Owner | H. Unused Labels |
| C. Diskette Type | I. Sector Size |
| D. Bad Cylinders | J. Bad Sectors |
| E. Error Count | K. Unused Sectors |
| F. Disk Format | |

File Information listed for a diskette or disk includes:

- | | |
|-------------------------|-------------------------|
| L. File Name | R. Write Protect |
| M. Record Count | S. Record and File Type |
| N. Record or Key Length | T. Open Status |
| O. Allocation (Sectors) | U. Reserve Status |
| P. Extents | V. Create Date |
| Q. Key Position | W. Update Date |

Press Enter to continue

Cmd 9 Cancel

You see screen 14-101 after screen 14-091.

This screen tells you the information that is listed for each disk volume or diskette.

The next screen you will see is screen 14-111.

Screen 14-111 (Description of List Information)

Description of List Information

14-111

General diskette or disk information is always shown. If no file information appears, then the requested information does not exist on the diskette or disk.

If you want the file information printed, but not the completion message, specify information to the screen only and use the Copy Display Function (Cmd/copy D) for each screen you want printed.

Information for freed file labels can only be obtained by selecting option 5.

NOTE: Information about open files (option 4), freed file labels (option 5), and file type (option 7), is only available for System 23 diskettes or disk.

Press Enter to return to menu

You see screen 14-111 after screen 14-101.

This screen tells you more information about LISTDISK.

The next screen you will see is screen 14-010, the List Information Menu screen.

Chapter 9. DISK.RECOVER

Introduction

Note: The DISK.RECOVER Customer Support Function is on your disk. It is also on your Customer Support Functions diskette. If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), DISK.RECOVER is on diskette VOL001.

Use this Customer Support Function to recover disk files only. Use Recover Diskette (RECOVER) to recover diskette files.

The Recover Disk (DISK.RECOVER) Customer Support Function helps you retrieve information on the disk when:

- You get a message (such as 6514) on the computer screen indicating that the computer cannot read your file. This can be caused by a damaged sector on the disk, either within the file itself or within the label area of the file.
- You accidentally drop or free a file.

DISK.RECOVER can only retrieve the good portion of damaged files. Areas of the files that have gone bad or have been written over cannot be reconstructed by DISK.RECOVER. This is explained in detail later in this chapter.

(See Chapter 6, "Commands," in the *Operator Reference* in binder 2, for details on the DROP and FREE commands.)

DISK.RECOVER has a set of screens that asks you to select what you want to do.

DISK.RECOVER

DISK.RECOVER choices

These are the choices you have on the menu for DISK.RECOVER. (Examples of using DISK.RECOVER start on page 9-15.)

1. *Description of Recover Disk*, which describes the DISK.RECOVER Customer Support Function.
2. *Recover volume directory*, which makes it possible for you to access your files if the volume directory is damaged.
3. *Recover a file*, which lets you recover a file if the file itself is damaged.
4. *Recover a dropped file*, which lets you recover a file if you accidentally drop the file.
5. *Recover a freed file*, which lets you recover a file if you accidentally free the file.

When you select this option, you need an output diskette with a special name; the VOLID of the output diskette must be three letters, followed by three numbers. See "Hints and considerations" on page 9-3 for additional information.

Hints and considerations

Keep the following in mind when you are using DISK.RECOVER:

- You will need the VOLID of the volume that contains the file you want to recover.
- If you accidentally *free* a file and want to recover it, you need output diskettes with special names to hold your freed file when it is recovered. DISK.RECOVER puts a backup copy of the freed file on diskettes to recover it. When you prepare the diskettes, make sure that:
 - The first three characters of the VOLIDs are the same.
 - The last three characters of these VOLIDs are numbers that increase by *one* for each diskette.

For example, you could use REC001 and REC002, or ABC010 and ABC011.

Note: DISK.RECOVER creates a backup copy of the freed file. You must return the file to the disk with the Restore option of BACKUP.RESTORE before the file can be used.

- If an error occurs while you are running Recover Volume Directory, run the option a second time. If you get the error code a second time, look up the error code in the *System Messages* book.
- If you are not sure about how to respond to a prompt on a screen, don't forget that you can use the ? to get help on the screens with that option. The description screens (option 1 on the menu) also provide information about DISK.RECOVER.
- If you want to stop DISK.RECOVER, use the Cmd key and the 9 on the numeric key pad on the screens that have

DISK.RECOVER

Hints and considerations (continued)

that option. To stop DISK.RECOVER after processing has started, use the Cmd and Attn keys.

- To make disk recovery easier, use the Backup option of BACKUP.RESTORE to make backup copies of your important files. Keep the backup diskettes in a safe place, away from the diskettes you use everyday.
- DISK.RECOVER cannot be run from a procedure file.

Starting DISK.RECOVER

Note: The DISK.RECOVER Customer Support Function is on your disk. It is also on your Customer Support Functions diskette. If you have both VOL001 (Diskette 1 of 2) and VOL002 (Diskette 2 of 2), DISK.RECOVER is on diskette VOL001.

To start DISK.RECOVER:

1. Type: LINK DISK.RECOVER
2. Press: Enter key

Because you are having problems with the disk, you may not be able to access any Customer Support Functions that are on your disk. If you cannot successfully link DISK.RECOVER, do this. Press the Error Reset key, and then insert your Customer Support Functions diskette that has DISK.RECOVER on it into any diskette drive and redo steps 1 and 2.

After DISK.RECOVER starts, you see a menu on the screen that asks you to select what you want to do.

DISK.RECOVER

Running recover volume directory

“Recover volume directory” is option 2 on the Recover Disk menu. You should run it if you get error code 4005, 6501 through 6521, or 6573 while you are using the DIR command.

If a file label has a read error, DISK.RECOVER attempts to display the name of the lost file. You should have your output go to the printer so that you will have a printed record of the status of the volume at the time it is being rebuilt by Recover Volume Directory.

Once you start Recover Volume Directory, it must run until it completes. The Cmd Attn keys cannot stop the program once it starts. This is to make sure that your volume directory is not left incomplete. When DISK.RECOVER is completed, it tells you how many files, if any, were lost.

(See Figure 7 on page 9-8, for a list of steps to follow for complete recovery.)

DISK.RECOVER cannot be run for an access-protected volume.

Note: If you get an error code when you run Recover Volume Directory, run the option a second time. If you get an error code the second time, look up the code in the *System Messages* book.

Running recover a file

“Recover a file” is option 3 on the Recover Disk menu. Run this option if you get error code 6573. You should look up the error code in the *System Messages* book before you run DISK.RECOVER.

Running “Recover a file” produces a file that the computer can read without finding any errors.

During file recovery, DISK.RECOVER reads each sector of the file. If it encounters a read error, it displays on the screen:

- The relative record numbers of records in the sectors that have errors. The sector is displayed because the file records are read by sectors.
- If possible, the data in the sector in both its internal (hexadecimal) and graphic (EBCDIC) representation. Some or all of this data may be incorrect.
- The data in the sectors before and after the error sectors.

The screens that provide this information do not require you to answer any prompts. If possible, you should print these screens. They will help you to reconstruct the records that have errors. DISK.RECOVER lets you select options to print this output.

After option 3 successfully completes, it is up to you to put any missing information into the new copy of the file. You can do this using a BASIC program.

The DISK.RECOVER program cannot replace missing information in your files. DISK.RECOVER does make it possible for you to access the good portion of your file. You can then find out what is missing and replace it.

The following table shows the steps you can use to recover your file. For example, to recover a file with a read error, you

DISK.RECOVER

Running recover a file (continued)

would first run option 3 (Recover a file) of DISK.RECOVER, then the LISTFILE Customer Support Function, and next a BASIC program.

Steps to follow for complete file recovery					
Steps	Type of recovery				
	Label	Data error		Dropped file	Freed file
		Record file	Source code		
1 Run. . .	DISK.RECOVER Option 2 (Recover volume directory)	DISK.RECOVER Option 3 (Recover a file)	DISK.RECOVER Option 3 (Recover a file)	DISK.RECOVER Option 4 (Recover a dropped file)	DISK.RECOVER Option 5 (Recover a freed file)
2 Run. . .	DISK.RECOVER Option 5 (Recover a freed file)	LISTFILE	LOAD filename, data		BACKUP.RESTORE Option 3 (Restore from diskette to disk)
3 Run. . .	BACKUP.RESTORE Option 3 (Restore from diskette to disk)	BASIC program	LIST command		LISTFILE
4 Run. . .	LISTFILE				BASIC program
5 Run. . .	BASIC program				

Figure 7. What to do for complete file recovery

As shown in the preceding table, restoring a file can require several steps. In some cases, you will need to use a BASIC program to completely restore your file. You may already have this program in the file maintenance portion of your application programs.

This BASIC program should be able to delete records by record number or by index key, depending on how you list your file using the LISTFILE Customer Support Function. If you list your file by index keys, all records with a 7919 error code should be deleted. A listing by keys can also help you find out what information is missing. For example, if the key file contains account numbers, LISTFILE will show the account numbers of the missing records in the file.

If you have other key files against the recovered file, you may wish to run LISTFILE with these keys to obtain additional information about the missing records.

After you have recovered all the information you need about the bad records, you should then delete these records. This is done to prevent the bad records from being used by your application programs.

Your application programs should be able to delete records from your files. Use the printout from LISTFILE to determine which records should be deleted.

DISK.RECOVER

Running recover a file (continued)

You then need to locate any important missing information and add it to your file. Use whatever means you can to get the missing information. There is no special way to do this. However, in general, you can look through printed information such as the information you printed when you ran DISK.RECOVER and LISTFILE. If required, you can also look for old bills, receipts, mailing lists, and so on.

After you have gathered the information you need, add the data to your file using the data entry part of your application programs.

Running dropped or freed file recovery

“Recover a dropped file” and “Recover a freed file” are options 4 and 5 on the Recover Disk menu. Run one of these options if you want to recover a file that was accidentally dropped or freed.

If you accidentally drop or free a file and you want to recover it, use DISK.RECOVER immediately and follow the instructions on the screens.

If there was any activity on the disk after you dropped or freed the file, you may need to refer to “Dropped file recovery” or “Freed file recovery” for additional information.

Dropped file recovery

When you drop a file, the space reserved for that file is still reserved, which means that the information in the file cannot be written over by another file. However, the computer cannot access the records because the label for the file indicates that the file does not have any records.

Option 4 of DISK.RECOVER helps you to recover a dropped file by making it possible for you to change the total record count to the value that it was at the time the file was dropped. You will then be able to access all the records that were in the file. DISK.RECOVER displays the previous record count and the maximum records.

How dropped file recovery works

Dropped file recovery does not copy the file that is being recovered. It writes a new value which you specify on the file label. This value is for the total record count.

DISK.RECOVER

Running dropped or freed file recovery (continued)

The disk is locked and cannot be used while this option is running.

Freed file recovery

When you free a file, the space reserved for that file is made available for other files. This means that your freed file can be destroyed if the space that was being used by it is given to another file.

If any activity takes place on the disk after your file is freed and before you can do a freed file recovery, you cannot be sure that the data in the freed file is still good.

If someone creates a new file on the disk after your file is freed, it is possible that the label of your freed file will be used again and that you will not be able to recover the file. You can use the LISTDISK Customer Support Function to see whether the file label is still there.

How freed file recovery works

To recover a freed file, you always need a prepared diskette. (See "Hints and considerations" on page 9-3, for information on how to prepare your output diskettes for freed file recovery.) When the freed file is recovered, DISK.RECOVER puts a backup copy of the file on diskette.

Before the backup copy of the freed file is put on the diskette, the screen tells you whether any of the space that was being used by your freed file is now being used by another file.

The screen may tell you that none of the space is being used by another file. However, you cannot be sure that all of the information in the freed file is still good. If anyone used the

disk after your file was freed, it is possible that some of the space may have been used by another file and then freed again.

You can only be certain that the information is still good if you run freed file recovery immediately after you free the file and no one has used the disk after your file was freed.

The screen may tell you that some of the space for the freed file is being used by another file. This doesn't necessarily mean that your data was destroyed.

You should always return the file to the disk using the Restore option of BACKUP.RESTORE. Then use the LISTFILE Customer Support Function to help you determine which records still have correct information and which records have been destroyed and written over by another file. If you find that some records in the file have been destroyed, you can reconstruct the data that was lost. You may need to write a BASIC program to do that.

If you are recovering a file that was freed by option 2 (Recover volume directory), all of the space for the file is marked as being used by other files. This is caused by the way the file is freed and should be ignored.

(See Figure 7 on page 9-8 for a list of steps to follow for complete file recovery.)

DISK.RECOVER

Examples of using DISK.RECOVER

This section contains four examples of using DISK.RECOVER:

- Recovering the volume directory
- Recovering a file having read errors
- Recovering a dropped file
- Recovering a freed file

Each example shows the screens DISK.RECOVER displays and how you respond to each screen.

Example 1. Recovering the volume directory

Suppose you have COPY in your volume named FOUR. You have tried to use the file and you keep getting error code 4005 on the status line. You probably will not be able to use the information in the file unless you run DISK.RECOVER, because the computer cannot read the volume label.

Note: The DISK.RECOVER Customer Support Function is on your disk.

You will need:

- The DISK.RECOVER Customer Support Function
- The VOLID of the volume that contains the file you are trying to use.

To start DISK.RECOVER:

1. Type: LINK DISK.RECOVER
2. Press: Enter key

When you see the option menu, enter 2 to choose "Recover volume directory."

Recover Disk Menu

43-010

Choose one of the following:

1. Description of Recover Disk
2. Recover volume directory
3. Recover a file
4. Recover a dropped file
5. Recover a freed file

9. End Recover Disk

Choice

2

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen asks if you want your messages displayed, displayed and printed, or printed only. You want to print this output, so type 3 and press Enter.

Recover Volume Directory

43-062

Information and messages to:

- 1-Screen only
 - 2-Screen and printer
 - 3-Printer only
- 3

Printer number

- 10-First printer
 - 11-Second printer
- 10

Required when
printer used

The next screen asks for the VOLID of the volume you want to recover. Type FOUR and press Enter.

Recover Volume Directory

43-072

VOLID

FOUR

Required

The next screen tells you that DISK.RECOVER is trying to fix the volume label.

Recover Volume Directory

43-152

Recover Disk in progress.

The next screen lists the names of files that have been freed. Just press Enter to see the next screen.

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

Recover Volume Directory

43-162

VOLID = FOUR

The file

COPY

has been freed.

The file descriptor has gone bad. You may attempt to retrieve this file by running option 5 (recover a freed file) but this might not work. Even if option 5 runs successfully, be skeptical of the data.

Press Enter to continue

The next screen shows how many files were lost and how many files are still in the volume.

Recover Volume Directory

43-222

VOLID = FOUR

0 files were lost

15 files remain

Press Enter to continue

Cmd 9 Cancel

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

A completion screen lets you know that DISK.RECOVER is complete. If you see screen 43-262 instead of 43-262, something went wrong. Run "Recover volume directory" a second time. If you get an error code the second time, look up the code in *System Messages* book. (See the Figure 7 on page 9-8 for the steps to follow for complete file recovery.)

Recover Volume Directory

43-252

Recover Disk completed.

Press Enter to return to menu

Example 2. Recovering a File

Suppose you have a file SDPWRT and you are getting read errors on data in this file. You can use the "Recover a file" option of DISK.RECOVER to recover as much of the data as possible.

After you run DISK.RECOVER, you can use a BASIC program or LISTFILE to determine what data is missing and use a BASIC program to replace it. (See Figure 7 on page 9-8 for steps to follow for complete file recovery.)

You will need:

- The DISK.RECOVER Customer Support Function
- The input VOLID
- The input filename

To start DISK.RECOVER

1. Type: LINK DISK.RECOVER
2. Press: Enter key

Note: The DISK.RECOVER Customer Support Function is on your disk.

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

After you press Enter, the option menu is displayed. Enter 3 to choose "Recover a file."

Recover Disk Menu

43-010

Choose one of the following:

1. Description of Recover Disk
2. Recover volume directory
3. Recover a file
4. Recover a dropped file
5. Recover a freed file

9. End Recover Disk

Choice

3

The next screen asks if you want your messages displayed, displayed and printed, or printed only. Just press the Enter for screen and printer.

Recover a File

43-063

Information and messages to:

- 1-Screen only
 - 2-Screen and printer
 - 3-Printer only
- 2

Printer number

- 10-First printer
 - 11-Second printer
- 10

Required when
printer used

Cmd 9 Cancel
? Help

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen asks for information about the file to be recovered. You want to recover file SDPWRT in volume CSF001. Type CSF001 for the VOLID and SDPWRT for the filename and press Enter.

Recover a File

43-093

Input VOLID

Required

csf001

Input filename

Required

sdpwrt

The next screen tells you that DISK.RECOVER is trying to recover your file.

Recover a File

43-153

Recover Disk in progress.

The next screen tells you which records are included in the sector or sectors with read errors.

Recover a File

43-173

A data read error has been detected between and including:

First record number	17
Last record number	24

Information in internal representation and graphic form for sectors on either side of bad sector(s) will be given to help programmer reconstruct lost data. Error sector(s) data will be provided if it exists.

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen indicates that the first sector of your file has a read error.

Recover a File

43-183

First sector in file is faulty.

Press Enter to continue

Cmd 9 Cancel

The next screen shows the first half of the error sector. Press Enter.

Recover a File															43-203				
WARNING: Data may be incorrect.															Error Sector 168F				
Internal representation															Graphic				
	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F			
0000	00	F0	F0	F1	F7	02	04	74	64	51	37	07	65	67	00	00	0017	èAé	AA
0010	00	73	60	8F	40	40	F1	F0	F0	F3	40	40	61	40	40	61	É-±	1003	/ /
0020	40	40	F0	F0	7A	F2	F4	7A	F2	F6	40	40	40	40	40	40	00,24,26		
0030	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40			
0040	00	F0	F0	F1	F8	03	03	28	23	42	26	13	00	58	00	00	0018	τ à	ì
0050	00	63	26	3F	40	40	F1	F0	F0	F2	40	40	61	40	40	61	À	1002	/ /
0060	40	40	F0	F0	7A	F2	F4	7A	F2	F6	40	40	40	40	40	40	00,24,26		
0070	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40			
0080	00	F0	F0	F1	F9	03	07	56	41	04	85	95	14	21	00	00	0019	ì en ±	
0090	00	99	10	3F	40	40	F1	F0	F0	F1	40	40	61	40	40	61	r	1001	/ /
00A0	40	40	F0	F0	7A	F2	F4	7A	F2	F7	40	40	40	40	40	40	00,24,27		
00B0	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40			
00C0	00	F0	F0	F2	F0	03	03	65	33	86	70	72	56	26	00	00	0020	À fœé!	
00D0	00	24	70	3F	40	40	F1	F0	F0	F0	40	40	61	40	40	61	ø	1000	/ /
00E0	40	40	F0	F0	7A	F2	F4	7A	F2	F7	40	40	40	40	40	40	00,24,27		
00F0	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40			

Press Enter to continue Cmd 9 Cancel

Note: It takes two screens to show one sector. The first screen shows the first 256 bytes. The second screen shows the second 256 bytes.

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen shows the second half of the error sector.
Press Enter.

```
Recover a File                                     43-203
WARNING: Data may be incorrect.                   Error Sector 168F
Internal representation                            Graphic
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

0100  5B C1 C3 C3 D5 E4 D4 E5 D6 D3 C9 C4 5B D5 E4 D4  *ACCNUMVOLID*NUM
0110  D9 C5 C3 E2 C9 E9 C5 5B C9 E3 C5 D4 D7 40 E3 D6  RECSIZE*ITEMP TO
0120  40 C5 E7 C9 E3 40 C6 C9 D3 C5 40 D4 C1 C9 D5 E3  EXIT FILE MAINT
0130  C5 D5 C1 D5 C3 C5 3C 3D 3E 00 00 8C 01 49 2C 5F  ENANCE + d n'^
0140  81 0C 3D 3E 00 00 96 01 5B 21 5F 3C 30 60 14 61  a + o $^ ^ ^ - /
0150  14 62 14 63 3D 3E 00 00 A0 01 64 31 5E 3D 3E 00  A A + u A; +
0160  00 AA 01 7C 61 30 64 3D 3B 0C E2 C5 E3 E2 40 D2  i @/A SETS K
0170  C5 E8 D5 E4 D4 5B 3E 00 00 B4 01 A4 30 65 3D 3B  EYNUM*+ f u;A
0180  1D D6 D7 C5 D5 40 C4 C1 E3 C1 4B C6 C9 D3 C5 40  OPEN DATA.FILE
0190  C6 D6 D9 40 D2 C5 E8 40 C1 C3 C3 C5 E2 E2 3E 00  FOR KEY ACCESS+
01A0  00 BE 01 BD 35 15 3A 01 01 00 00 00 00 00 00 00  '
01B0  3C 80 E1 66 3C 13 3D 3E 00 00 C8 01 C6 30 67 3D  Ø Å + H F;A
01C0  3E 00 00 D2 01 CE 33 3D 3E 00 00 DC 01 D8 60 30  + K ó + ú Q-γ
01D0  64 3D 3E 90 00 E6 00 10 30 65 3D 3E 40 00 F0 02  Å +° W γÁ + 0
01E0  09 29 15 3A 01 01 00 00 00 00 00 00 00 3C 28 68  r                                     τÇ
01F0  80 E1 66 3C 13 69 22 6A 22 6B 22 6C 22 6D 22 6E  Ø Å Ñ!t,t,t;t_t>

Press Enter to continue                               Cmd 9 Cancel
```

The next screens show the sector following the sectors with read errors. The first screen shows the first half of that sector; the second screen shows the second half of the sector. Press Enter.

Recover a File

43-233

	Internal representation	Following Sector 168F Graphic
	00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F	
0000	00 F0 F0 F1 F7 02 04 74 64 51 37 07 65 67 00 00	0017 ÈA6 AA
0010	00 73 60 8F 40 40 F1 F0 F0 F3 40 40 61 40 40 61	È-± 1003 / /
0020	40 40 F0 F0 7A F2 F4 7A F2 F6 40 40 40 40 40 40	00:24:26
0030	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
0040	00 F0 F0 F1 F8 03 03 28 23 42 26 13 00 58 00 00	0018 τ à i
0050	00 63 26 3F 40 40 F1 F0 F0 F2 40 40 61 40 40 61	Ä 1002 / /
0060	40 40 F0 F0 7A F2 F4 7A F2 F6 40 40 40 40 40 40	00:24:26
0070	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
0080	00 F0 F0 F1 F9 03 07 56 41 04 85 95 14 21 00 00	0019 i en ±
0090	00 99 10 3F 40 40 F1 F0 F0 F1 40 40 61 40 40 61	r 1001 / /
00A0	40 40 F0 F0 7A F2 F4 7A F2 F7 40 40 40 40 40 40	00:24:27
00B0	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
00C0	00 F0 F0 F2 F0 03 03 65 33 86 70 72 56 26 00 00	0020 Ä f#Éf
00D0	00 24 70 3F 40 40 F1 F0 F0 F0 40 40 61 40 40 61	# 1000 / /
00E0	40 40 F0 F0 7A F2 F4 7A F2 F7 40 40 40 40 40 40	00:24:27
00F0	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	

Press Enter to continue

Cmd 9 Cancel

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen is a continuation of the preceding screen.
Press Enter.

Recover a File

43-233

	Internal representation	Following Sector 168F Graphic
	00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F	
0100	5B C1 C3 C3 D5 E4 D4 E5 D6 D3 C9 C4 5B D5 E4 D4	\$ACCNUMVOLID\$NUM
0110	09 C5 C3 E2 C9 E9 C5 5B C9 E3 C5 D4 D7 40 E3 D6	RECSIZE\$ITEMP TO
0120	40 C5 E7 C9 E3 40 C6 C9 D3 C5 40 D4 C1 C9 D5 E3	EXIT FILE MAINT
0130	C5 D5 C1 D5 C3 C5 3C 3D 3E 00 00 8C 01 49 2C 5F	ENANCE + d R^
0140	81 0C 3D 3E 00 00 96 01 5B 21 5F 3C 30 60 14 61	a + o \$^ ^ - /
0150	14 62 14 63 3D 3E 00 00 A0 01 64 31 5E 3D 3E 00	A A + μ A1, +
0160	00 AA 01 7C 61 30 64 3D 3B 0C E2 C5 E3 E2 40 D2	i @/A SETS K
0170	C5 E8 D5 E4 D4 5B 3E 00 00 B4 01 A4 30 65 3D 3B	EYNUM\$+ f u1A
0180	1D D6 D7 C5 D5 40 C4 C1 E3 C1 4B C6 C9 D3 C5 40	OPEN DATA.FILE
0190	C6 D6 D9 40 D2 C5 E8 40 C1 C3 C3 C5 E2 E2 3E 00	FOR KEY ACCESS+
01A0	00 BE 01 BD 35 15 3A 01 01 00 00 00 00 00 00 00	' -
01B0	3C 80 E1 66 3C 13 3D 3E 00 00 C8 01 C6 30 67 3D	ø Å + H F, A
01C0	3E 00 00 D2 01 CE 33 3D 3E 00 00 DC 01 D8 60 30	+ K ó + ü Q-1
01D0	64 3D 3E 90 00 E6 00 10 30 65 3D 3E 40 00 F0 02	A +* W 1A + 0
01E0	09 29 15 3A 01 01 00 00 00 00 00 00 00 3C 28 68	r ->
01F0	80 E1 66 3C 13 69 22 6A 22 6B 22 6C 22 6D 22 6E	ø Å N!t, tZt_>

Press Enter to continue

Cmd 9 Cancel

The next screen indicates that recovery is complete.

Recover a File

43-253

Recover Disk completed.

You can now check the contents of SDPWRT and determine which information is missing and must be added. (See Figure 7 on page 9-8 for steps to follow for complete file recovery.)

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

Example 3. Recovering a dropped file

Suppose you were using the BASIC command DROP to drop some files you no longer needed. You accidentally dropped a file that you still need; the file is named SDPWRT and is on your disk volume named CSF001.

When you drop a file, the space reserved for that file is still reserved. The computer cannot access the file because the file appears to have no records.

To recover this file, you will need:

- The DISK.RECOVER Customer Support Function
- The input VOLID
- The input filename

To start DISK.RECOVER:

1. Type: LINK DISK.RECOVER
2. Press: Enter key

Note: The DISK.RECOVER Customer Support Function is on your disk.

After you press Enter, the option menu is displayed. Enter 4 to choose "Recover a dropped file."

Recover Disk Menu

43-010

Choose one of the following:

1. Description of Recover Disk
2. Recover volume directory
3. Recover a file
4. Recover a dropped file
5. Recover a freed file

9. End Recover Disk

Choice

4

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen asks if you want your messages displayed, displayed and printed, or printed only. You only want to display the output, so type 1 and press Enter.

Recover a Dropped File

43-064

Information and messages to:

- 1-Screen only
 - 2-Screen and printer
 - 3-Printer only
- 1

Printer number

- 10-First printer
 - 11-Second printer
- 10

Required when
printer used

The next screen asks for information about the dropped file you want to recover. Enter CSF001 as the input VOLID and SDPWRT as the input filename.

Recover a Dropped File

43-094

Input VOLID

csf001

Required

Input filename

sdpwrt

Required

The next screen shows how many records were in the file when the file was dropped and how many records the file can hold.

This screen also asks you to indicate a new total record count. Use the previous record count shown on the screen, enter 7.

Recover a Dropped File

43-114

Total record count

Current	0
Previous	7
Maximum	300

Type the value desired for the total record count.

New total record count

7

The next screen tells you that the record count for filename SDPWRT is being changed from 0 to 7, as you requested.

Recover a Dropped File

43-154

Recover Disk in progress.

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen indicates that recovery of your dropped is complete.

Recover a Dropped File

43-254

Recover Disk completed.

Press Enter to return to menu

Example 4. Recovering a freed file

Suppose you were using the BASIC FREE command to free some files you no longer needed. You accidentally freed a file that you still need. The file is named ABC, and it was on your disk volume named COSMOS. The backup copy of the freed file will be put on diskette RECO01.

When you free a file, the space used by the file is made available for other files. Now some of the space that belonged to the file you freed is now being used by another file. (If this is the case, you will find this out when you run DISK.RECOVER.)

You will need:

- The DISK.RECOVER Customer Support Function
- REC001 diskette to receive the backup copy produced by DISK.RECOVER. This diskette should be prepared in the way described under "Hints and considerations" on page 9-3.
- The input filename
- The input and output VOLIDs

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

Note: The DISK.RECOVER Customer Support Function is on your disk.

To start DISK.RECOVER:

1. Type: LINK DISK.RECOVER
2. Press: Enter key

After you press Enter, the option menu is displayed. Enter 5 to choose "Recover a freed file."

Recover Disk Menu

43-010

Choose one of the following:

1. Description of Recover Disk
2. Recover volume directory
3. Recover a file
4. Recover a dropped file
5. Recover a freed file

9. End Recover Disk

Choice
5

The next screen asks if you want your information and messages displayed, displayed and printed, or printed only. You want to display and print the output, so just press Enter.

Recover a Freed File

43-085

Information and messages to:

- 1-Screen only
 - 2-Screen and printer
 - 3-Printer only
- 2

Printer number

- 10-First printer
 - 11-Second printer
- 10

Required when
printer used

The next screen asks whether you want to destroy any information on the output diskette. Use Y only if you are sure it is OK to destroy any existing information on the diskette.

Recover a Freed File

43-085

Destroy information on output diskette

- Y-OK to destroy all existing data
 - N-Do not destroy data
- y

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen asks for information about the freed file you want to recover. Enter COSMOS as your input VOLID, ABC as your input filename, 1 as your output drive number, and REC001 as your output VOLID.

Insert your output diskette (REC001) into drive 1, and press the Enter key.

Recover a Freed File

43-105

Input VOLID <u>cosmos</u>	Required
Input filename <u>abc</u>	Required
Output drive number <u>1</u>	Optional when VOLID provided
Output VOLID <u>rec001</u>	Optional when drive provided

INSERT DISKETTE NOW.

Cmd 9 Cancel
? Help

The next screen warns you that some of the space previously used by filename ABC is now being used by another file. It gives you the PBNs (physical block numbers) being used by the other file. Press Enter.

(Ignore this screen if your file was freed by option 2 of DISK.RECOVER.)

Recover a Freed File

43-125

WARNING: The following space is occupied by other files.

Beginning PBN
Press Enter to continue

18E3

Ending PBN

191D
Cmd 9 Cancel

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen tells you that your file will be copied to a new file and asks you to check the new file and correct it if necessary. Press Enter to continue.

Recover a Freed File

43-135

Some of the sectors in this file are currently allocated to another file. This file will be copied to a new file. It will be your responsibility to validate the data in the new file and to correct it if necessary.

Press Enter to continue

Cmd 9 Cancel

The next screen tells you that DISK.RECOVER is putting a backup copy of file ABC on your output diskette RECO01.

Recover a Freed File

43-155

Recover Disk in progress.

DISK.RECOVER

Examples of using DISK.RECOVER (continued)

The next screen reminds you that your recovered file on diskette is a backup copy. That means that you must return the file to the disk using the Restore option of BACKUP.RESTORE before you can check the file.

Recover a Freed File

43-275

Your recovery of a freed file has completed successfully. DISK.RECOVER has stored the recovered file on one or more diskettes, just like the backup option of the BACKUP.RESTORE Customer Support Function does.

It is possible that some or all of the data in your file was destroyed, between the time the file was freed, and the DISK.RECOVER Customer Support Function was run. You must examine the data before you use it again, to make sure it is still good, or, if it has been altered, you will have to recreate the data.

In order to examine the data, you must first restore it to the disk, using the restore option of the BACKUP.RESTORE Customer Support Function.

Once the file has been restored, you must examine the data to see if it is still good. Refer to Customer Support Functions Manuals.

Press Enter to continue

Cmd 9 Cancel

The next screen indicates recovery of your freed file is complete.

Recover a Freed File

43-255

Recover Disk completed.

Press Enter to return to menu

You now have a file named ABC on diskette REC001. You must use the Restore option of BACKUP.RESTORE to return the file to the disk before this file can be used.

See Figure 7 on page 9-8 for steps to follow complete file recovery.

DISK.RECOVER

Screens

This section shows the screens that can appear while you are running DISK.RECOVER. The screens are shown in numeric order by screen number, starting with the lowest screen number.

The order of screens in this section is not the order in which they appear while you are running DISK.RECOVER. The order depends on the choices you select on the menu and your answers to certain prompts.

Screen 43-010 (Recover Disk Menu)

Recover Disk Menu

43-010

Choose one of the following:

1. Description of Recover Disk
2. Recover volume directory
3. Recover a file
4. Recover a dropped file
5. Recover a freed file

9. End Recover Disk

Choice

-

You see screen 43-010 after you type LINK
DISK.RECOVER and press the Enter key.

DISK.RECOVER

Screens (continued)

This screen lets you choose one of the following:

1. Description of DISK.RECOVER. Choose 1 to get a description of DISK.RECOVER. The next screen you will see is screen 43-021.
2. Recover volume directory. Choose 2 to process a volume so that any remaining good portions of the volume directory are accessible. The next screen you will see is screen 43-062.
3. Recover a file. Choose 3 to make all good portions of a file accessible. The next screen you will see is screen 43-063.
4. Recover a dropped file. Choose 4 to recover a file that was accidentally dropped. The next screen you will see is screen 43-064.
5. Recover a freed file. Choose 5 to recover a file that was accidentally freed. The next screen you will see is screen 43-065.
9. **End DISK.RECOVER.** Choose 9 to end DISK.RECOVER. The next screen you will see shows the READY INPUT status.

Type 1, 2, 3, 4, 5, or 9.

Screen 43-021 (Description of Recover Disk)

Description of Recover Disk

43-021

The following keys are used in all Customer Support Functions:

Enter - Press Enter key to advance to the next screen when all requested information has been typed in.

? - If '? Help' appears on the screen, you can get more information by typing a ? in the first position of that field and then pressing Enter.

Cmd 9 - If 'Cmd 9 Cancel' appears on the screen, and you wish to return to the menu, press and hold the Cmd key while pressing the 9 key on the numeric key pad. It is not necessary to press the Enter key.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-021 after you choose 1 on screen 43-010, the Recover Disk Menu.

DISK.RECOVER

Screens (continued)

This screen tells you about keys used in all the Customer Support Functions. It describes:

1. How to use the Enter key
2. How to get help
3. How to cancel and start over

The next screen you will see is screen 43-031.

Screen 43-031 (Description of DISK.RECOVER)

Description of Recover Disk

43-031

This Customer Support Function should be run to assign an alternate sector for a defective sector when a read error has been reported to you. It can also be run to recover a file which you have accidentally dropped or freed. More information can be found in Customer Support Function manuals for operators and programmers.

An understanding of disk input/output errors is helpful for using this Customer Support Function. For further information refer to the messages manual.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-031 after screen 43-021.

This screen tells you when DISK.RECOVER should be run.

The next screen you will see is screen 43-041.

DISK.RECOVER

Screens (continued)

Screen 43-041 (Description of DISK.RECOVER)

Description of Recover Disk

43-041

When you choose the 'Recover volume directory' option, an alternate sector will be assigned for any defective sector in the label area. When a read error occurs on a file label sector, you will sometimes lose a file. When disk recovery is completed, you will be told how many read errors occurred in the file label area and how many file labels may be missing.

When you choose the 'Recover a file' option, an alternate sector will be assigned for any defective sector which is found in the specified file. The data in the defective sector will be replaced with blanks in the alternate sector.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-041 after screen 43-032.

This screen tells you about options 2 and 3.

The next screen you will see is screen 43-051.

Screen 43-051 (Description of DISK.RECOVER)

Description of Recover Disk

43-051

When you choose the 'Recover a dropped file' option, you need to know the correct number of records in the file. If the record count is not known, you may use the 'previous record count', but recovery results could be incorrect.

When you choose the 'Recover a freed file' option, a backup/restore copy of the file will be done. The output file must be located on diskette(s). If any space from the freed file is being used currently, a warning will be given.

Press Enter to return to menu

You see screen 43-051 after screen 43-041.

This screen tells you about options 4 and 5.

The next screen you will see is screen 43-010, the Recover Disk Menu.

DISK.RECOVER

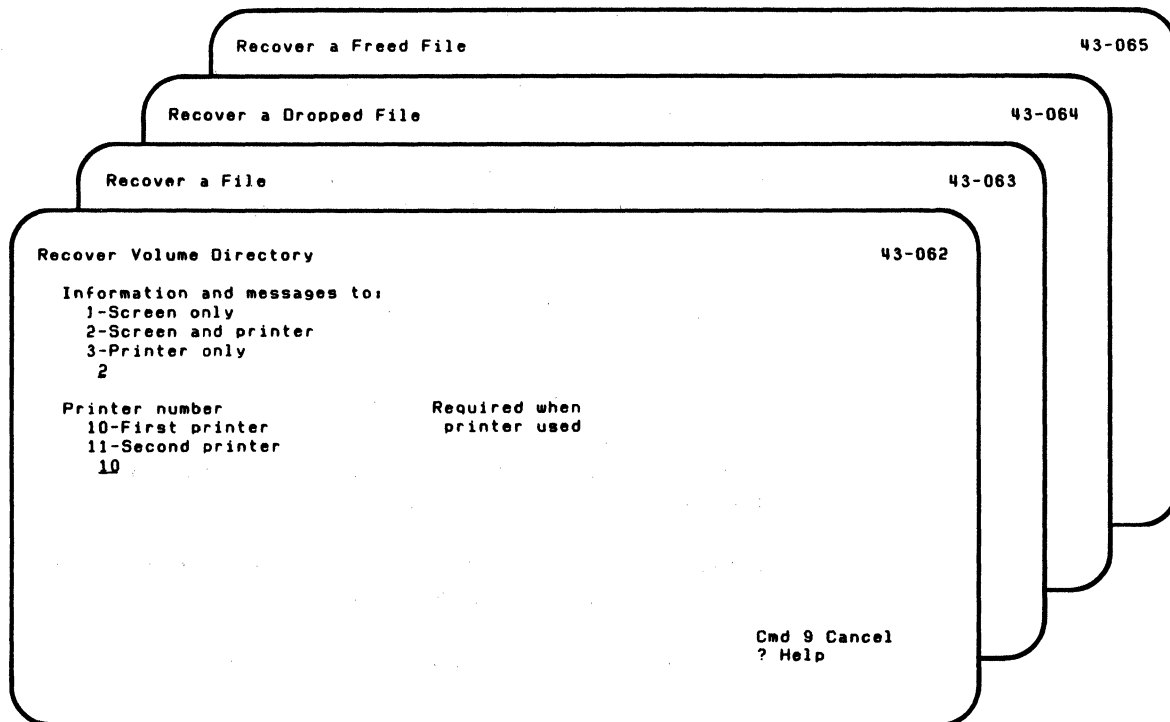
Screens (continued)

Screen 43-062 (Recover Volume Information)

Screen 43-063 (Recover a File)

Screen 43-064 (Recover a Dropped File)

Screen 43-065 (Recover a Freed File)



You see screen 43-062 after you choose 2 on screen 43-010, the Recover Disk Menu.

You see screen 43-063 after you choose 3 on screen 43-010, the Recover Disk Menu.

You see screen 43-064 after you choose 4 on screen 43-010, the Recover Disk Menu.

You see screen 43-065 after you choose 5 on screen 43-010, the Recover Disk Menu.

These screens ask you to tell where the information is to be shown.

Information and messages to:

1-Screen only. Choose 1 to show all information and messages only on the screen.

2-Screen and printer. Choose 2 to show all information and messages on both the screen and printer.

3-Printer only. Choose 3 to show all information and messages only on the printer.

Type 1, 2, or 3 in the space provided. (If you do not type a value, then 2 is assumed.)

DISK.RECOVER

Screens (continued)

Printer number:

10-First printer. Choose 10 to show all information and messages on the first printer.

11-Second printer. Choose 11 to show all information and messages on the second printer.

Type 10 or 11 in the space provided. (If you do not type a value, then 10 is assumed.)

After screen 43-062, the next screen you will see is screen 43-072.

After screen 43-063, the next screen you will see is screen 43-093.

After screen 43-064, the next screen you will see is screen 43-094.

After screen 43-065, the next screen you will see is screen 43-085.

Screen 43-072 (Recover Volume Information)

Recover Volume Directory	43-072
VOLID	Required
<u>z01001</u>	
	Cmd 9 Cancel
	? Help

You see screen 43-072 after screen 43-062.

This screen asks you for information about the volume to be recovered.

DISK.RECOVER

Screens (continued)

VOLID. This is the name of the volume to be recovered.

Type the name in the space provided.

The next screen you will see is screen 43-152.

Screen 43-085 (Recover a Freed File)

Recover a Freed File

43-085

Destroy information on output diskette

Y-OK to destroy all existing data

N-Do not destroy data

N

Cmd 9 Cancel
? Help

You see screen 43-085 after screen 43-065.

This screen asks you if the information on the output diskette can be destroyed.

DISK.RECOVER

Screens (continued)

Destroy information on output disk or diskette

Choose Y if it is okay to destroy data that exists on the output diskette you have inserted.

Choose N if you do not want to destroy the data on the output diskette.

Type Y or N in the space provided. (If you do not type a value, then N is assumed.)

The next screen you will see is screen 43-105.

Screen 43-093 (Recover a File)
Screen 43-094 (Recover a Dropped File)

The diagram shows two overlapping terminal windows. The front window, titled "Recover a File" (43-093), contains the following text:

```
Recover a File                                     43-093
Input VOLID                                         Required
  csf1
Input filename                                       Required
  dskdump
                                                    Cmd 9 Cancel
                                                    ? Help
```

The back window, titled "Recover a Dropped File" (43-094), is partially obscured by the front window.

You see screen 43-093 after screen 43-063.

You see screen 43-094 after screen 43-064.

These screens ask you for information about the files to be recovered.

DISK.RECOVER

Screens (continued)

Input VALID. This is the name of the volume that contains the file to be recovered.

Type the name of the volume in the space provided.

Input Filename. This is the name of the file to be recovered.

Type the name in the space provided.

After screen 43-093, the next screen you will see is screen 43-153.

After screen 43-094, the next screen you will see is screen 43-114.

Screen 43-105 (Recover a Freed File)

Recover a Freed File

43-105

Input VOLID

csf1

Required

Input filename

dskdump

Required

Output drive number

-

Optional when
VOLID provided

Output VOLID

Optional when
drive provided

INSERT DISKETTE NOW.

Cmd 9 Cancel
? Help

You see screen 43-105 after screen 43-085.

This screen asks you for information about the file to be recovered.

DISK.RECOVER

Screens (continued)

Input VOLID. This is the name of the volume that contains the file to be recovered.

Type the name of the volume in the space provided.

Input filename. This is the name of the file to be recovered.

Type the name in the space provided.

Output drive number. This is the number of the diskette drive that is to contain the diskette to be used.

Type the number in the space provided.

Output VOLID. This is the name of the diskette that will contain the reconstructed file. The last three characters of the output VOLID must be numbers. For additional information on how to name the output diskette, see "Hints and considerations" on page 9-3.

The output file is a backup copy of a file that must be returned to the disk with the BACKUP.RESTORE Customer Support Function before it can be used.

Type the name of the *first* diskette in the space provided.

The next screen you will see is screen 43-125 or 43-145.

Screen 43-114 (Recover a Dropped File)

Recover a Dropped File

43-114

Total record count

Current	1
Previous	0
Maximum	1

Type the value desired for the total record count.

New total record count

Cmd 9 Cancel
? Help

You see screen 43-114 after screen 43-094.

DISK.RECOVER

Screens (continued)

This screen tells you about the number of records in the dropped file and allows you to change the total record count. If the file really was dropped, the value shown for "Current" is 0. The value shown for "Previous" is the record count the last time the record count for the file changed. The value shown for "Maximum" is the largest number of records the file can contain in the amount of disk space reserved for it.

New total record count. This is the number of records to be contained in the recovered file. The number should be between zero and the *maximum* specified.

Type the number in the space provided.

The next screen you will see is screen 43-154.

Screen 43-125 (Recover a Freed File)

Note: You should ignore this screen if your file was freed by option 2 of DISK.RECOVER.

Recover a Freed File

43-125

WARNING: The following space is occupied by other files.

Beginning PBN
Press Enter to continue

18E3

Ending PBN

191D
Cmd 9 Cancel

You see screen 43-125 after screen 43-105.

DISK.RECOVER

Screens (continued)

This screen tells you some of the sectors in the freed file that are allocated to another file.

If no sectors in the file are currently allocated, this screen will not appear.

The next screen you will see is screen 43-135.

Screen 43-135 (Recover a Freed File)

Note: You should ignore this screen if your file was freed by option 2 of DISK.RECOVER.

Recover a Freed File

43-135

Some of the sectors in this file are currently allocated to another file.
This file will be copied to a new file. It will be your responsibility to
validate the data in the new file and to correct it if necessary.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-135 after screen 43-125.

DISK.RECOVER

Screens (continued)

This screen tells you that some of the sectors in the freed file are allocated to another file.

The next screen you will see is screen 43-155.

Screen 43-145 (Recover a Freed File)

Recover a Freed File

43-145

None of the sectors in this file are currently allocated to another file. However, this does not guarantee that the data in the file is good. This file will be copied to a new file. It will be your responsibility to validate the data in the new file and to correct it if necessary.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-145 after screen 43-105.

DISK.RECOVER

Screens (continued)

This screen tells you that none of the sectors in the freed file are allocated to another file.

The next screen you will see is screen 43-155.

Screen 43-162 (Recover Volume Directory)

Recover Volume Directory

43-162

VOLID = FOUR

The file

COPY

has been freed.

The file descriptor has gone bad. You may attempt to retrieve this file by running option 5 (recover a freed file) but this might not work. Even if option 5 runs successfully, be skeptical of the data.

Press Enter to continue

You see screen 43-162 after screen 43-152.

DISK.RECOVER

Screens (continued)

This screen tells you the name of the file that was lost because the file label was bad.

The next screen you will see is screen 43-222.

Screen 43-173 (Recover a File)

Recover a File

43-173

A data read error has been detected between and including:

First record number	17
Last record number	24

Information in internal representation and graphic form for sectors on either side of bad sector(s) will be given to help programmer reconstruct lost data. Error sector(s) data will be provided if it exists.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-173 after screen 43-153.

DISK.RECOVER

Screens (continued)

This screen appears if DISK.RECOVER encounters read errors in the file being recovered.

The first and last record numbers are relative record numbers that overlap the bad portion of the disk.

The next screen you will see is screen 43-183, 43-193, or 43-263.

Screen 43-183 (Recover a File)

Recover a File

43-183

First sector in file is faulty.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-183 after screen 43-173.

DISK.RECOVER

Screens (continued)

This screen tells you that a read error was encountered in the first sector. (Therefore, a preceding sector does not exist and screen 43-193 will not be shown.)

The next screen you will see is screen 43-203.

Screen 43-193 (Recover a File)

Recover a File

43-193

	Internal representation	Previous Sector	168F	Graphic
	00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F			
0000	00 F0 F0 F0 F1 03 01 31 53 77 88 14 31 66 00 00			0001 4ëih 4Ä
0010	00 75 56 0F 40 40 F1 F0 F1 F9 40 40 61 40 40 61			if 1019 / /
0020	40 40 F0 F0 7A F2 F4 7A F1 F9 40 40 40 40 40 40			00:24:19
0030	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40			
0040	00 F0 F0 F0 F2 03 04 58 65 01 31 92 34 49 00 00			0002 4A 4k-Ä
0050	00 53 27 6F 40 40 F1 F0 F1 F8 40 40 61 40 40 61			ë ? 1018 / /
0060	40 40 F0 F0 7A F2 F4 7A F2 F0 40 40 40 40 40 40			00:24:20
0070	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40			
0080	00 F0 F0 F0 F3 03 02 18 95 91 86 32 80 90 00 00			0003 njf ø*
0090	00 04 70 4F 40 40 F1 F0 F1 F7 40 40 61 40 40 61			ø! 1017 / /
00A0	40 40 F0 F0 7A F2 F4 7A F2 F0 40 40 40 40 40 40			00:24:20
00B0	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40			
00C0	00 F0 F0 F0 F4 03 06 78 86 47 16 86 83 19 00 00			0004 ifÄ fc
00D0	00 67 92 9F 40 40 F1 F0 F1 F6 40 40 61 40 40 61			Äkx 1016 / /
00E0	40 40 F0 F0 7A F2 F4 7A F2 F1 40 40 40 40 40 40			00:24:21
00F0	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40			

Press Enter to continue

Cmd 9 Cancel

You see screen 43-193 after screen 43-173.

DISK.RECOVER

Screens (continued)

This screen shows you the sector that precedes the sector in which a read error was encountered.

The next screen you will see is screen 43-203.

Screen 43-203 (Recover a File)

Recover a File

43-203

WARNING: Data may be incorrect.

Error Sector 168F

Internal representation

Graphic

00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

0000	00 F0 F0 F1 F7 02 04 74 64 51 37 07 65 67 00 00	0017 èA6 AA
0010	00 73 60 8F 40 40 F1 F0 F0 F3 40 40 61 40 40 61	é-± 1003 / /
0020	40 40 F0 F0 7A F2 F4 7A F2 F6 40 40 40 40 40 40	00:24:26
0030	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
0040	00 F0 F0 F1 F8 03 03 28 23 42 26 13 00 58 00 00	0018 τ à i
0050	00 63 26 3F 40 40 F1 F0 F0 F2 40 40 61 40 40 61	Ä 1002 / /
0060	40 40 F0 F0 7A F2 F4 7A F2 F6 40 40 40 40 40 40	00:24:26
0070	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
0080	00 F0 F0 F1 F9 03 07 56 41 04 85 95 14 21 00 00	0019 i en ±
0090	00 99 10 3F 40 40 F1 F0 F0 F1 40 40 61 40 40 61	r 1001 / /
00A0	40 40 F0 F0 7A F2 F4 7A F2 F7 40 40 40 40 40 40	00:24:27
00B0	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
00C0	00 F0 F0 F2 F0 03 03 65 33 86 70 72 56 26 00 00	0020 Å fœ!i
00D0	00 24 70 3F 40 40 F1 F0 F0 F0 40 40 61 40 40 61	ø 1000 / /
00E0	40 40 F0 F0 7A F2 F4 7A F2 F7 40 40 40 40 40 40	00:24:27
00F0	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	

Press Enter to continue

Cmd 9 Cancel

You see screen 43-203 after screen 43-193.

DISK.RECOVER

Screens (continued)

This screen shows you half of the data in a sector in which a read error was encountered. This screen is shown twice for each sector that had a read error.

The next screen you will see is screen 43-233
or 43-243.

Screen 43-213 (Recover a File)

Recover a File

43-213

No sectors in file are faulty.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-213 after screen 43-153.

DISK.RECOVER

Screens (continued)

This screen tells you that all sectors in the file were readable when the program was run.

The next screen you will see is screen 43-253.

Screen 43-222 (Recover Volume Directory)

Recover Volume Directory

43-222

VOLID = CSF1

0 files were lost

24 files remain

Press Enter to continue

Cmd 9 Cancel

You see screen 43-222 after screen 43-152 or 43-162.

DISK.RECOVER

Screens (continued)

This screen tells you how many files were lost and how many files remain after processing. The lost file information will appear only if the program detected that space was lost.

The next screen you will see is screen 43-255 (if the recovery was successful) or screen 43-265 (if the recovery was not successful).

Screen 43-233 (Recover a File)

Recover a File		43-233
	Following Sector 168F	
	Graphic	
	Internal representation	
	00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F	
0000	00 F0 F0 F1 F7 02 04 74 64 51 37 07 65 67 00 00	0017 ÈA6 AA
0010	00 73 60 8F 40 40 F1 F0 F0 F3 40 40 61 40 40 61	È-± 1003 / /
0020	40 40 F0 F0 7A F2 F4 7A F2 F6 40 40 40 40 40 40	00:24:26
0030	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
0040	00 F0 F0 F1 F8 03 03 28 23 42 26 13 00 58 00 00	0018 τ à ì
0050	00 63 26 3F 40 40 F1 F0 F0 F2 40 40 61 40 40 61	À 1002 / /
0060	40 40 F0 F0 7A F2 F4 7A F2 F6 40 40 40 40 40 40	00:24:26
0070	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
0080	00 F0 F0 F1 F9 03 07 56 41 04 85 95 14 21 00 00	0019 ì en ±
0090	00 99 10 3F 40 40 F1 F0 F0 F1 40 40 61 40 40 61	r 1001 / /
00A0	40 40 F0 F0 7A F2 F4 7A F2 F7 40 40 40 40 40 40	00:24:27
00B0	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
00C0	00 F0 F0 F2 F0 03 03 65 33 86 70 72 56 26 00 00	0020 A føÈì
00D0	00 24 70 3F 40 40 F1 F0 F0 F0 40 40 61 40 40 61	ø 1000 / /
00E0	40 40 F0 F0 7A F2 F4 7A F2 F7 40 40 40 40 40 40	00:24:27
00F0	40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40	
	Press Enter to continue	Cmd 9 Cancel

You see screen 43-233 after screen 43-203.

DISK.RECOVER

Screens (continued)

This screen shows you the first good sector that follows the sector in which a read error was encountered. (This screen will not appear if the last sector has a read error.)

The next screen you will see is screen 43-253 (if the recovery was successful) or screen 43-263 (if the recovery was not successful).

Screen 43-243 (Recover a File)

Recover a File

43-243

Last sector in file is faulty.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-243 after screen 43-203.

DISK.RECOVER

Screens (continued)

This screen tells you that a read error was encountered in the last sector.

This screen is shown instead of 43-233.

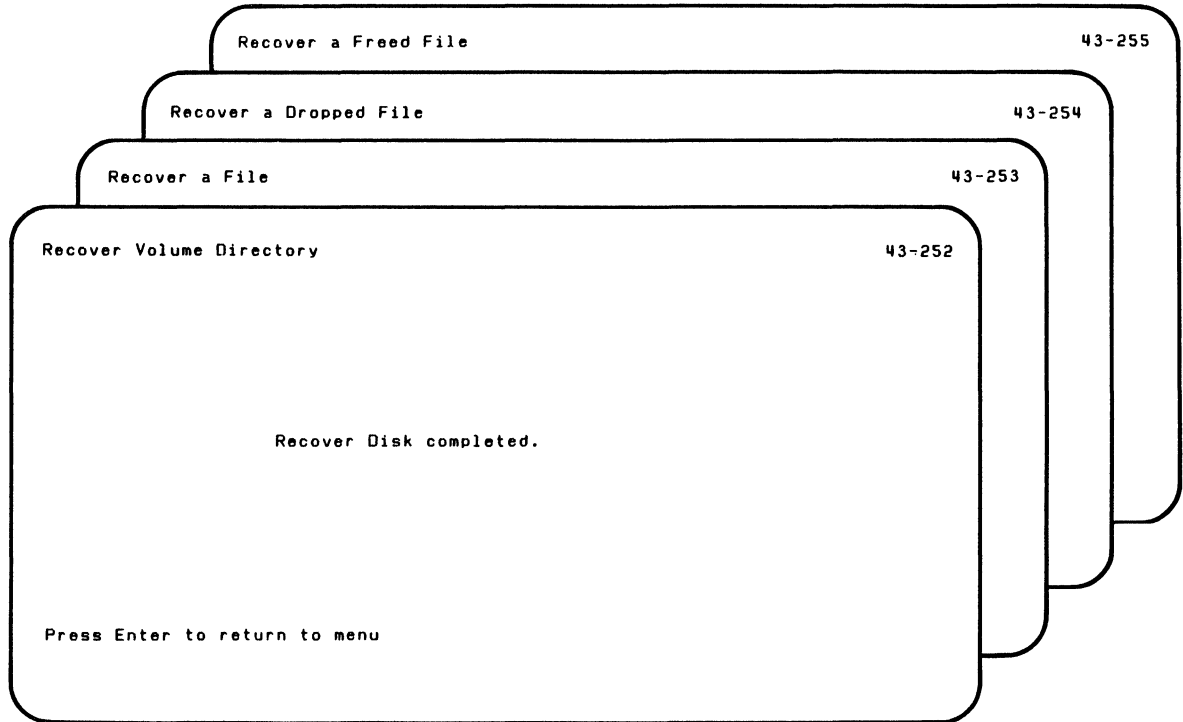
The next screen you will see is screen 43-253 (if the recovery was successful), or screen 43-263 (if the recovery was not successful).

Screen 43-252 (Recover Volume Directory)

Screen 43-253 (Recover a File)

Screen 43-254 (Recover a Dropped File)

Screen 43-255 (Recover a Freed File)



DISK.RECOVER

Screens (continued)

You see screen 43-052 after screen 43-222 if the volume directory recovery is successful.

You see screen 43-253 after screen 43-213, 43-233, or 43-243 if the file recover is successful.

You see screen 43-254 after screen 43-154 if the dropped file recovery is successful.

You see screen 43-255 after screen 43-155 if the freed file recovery is successful.

These screens show you successful completion of DISK.RECOVER.

The next screen you will see is screen 43-010, the Recover Disk Menu.

Screen 43-275 (Recover a Freed File)

Recover a Freed File

43-275

Your recovery of a freed file has completed successfully. DISK.RECOVER has stored the recovered file on one or more diskettes, just like the backup option of the BACKUP.RESTORE Customer Support Function does.

It is possible that some or all of the data in your file was destroyed, between the time the file was freed, and the DISK.RECOVER Customer Support Function was run. You must examine the data before you use it again, to make sure it is still good, or, if it has been altered, you will have to recreate the data.

In order to examine the data, you must first restore it to the disk, using the restore option of the BACKUP.RESTORE Customer Support Function.

Once the file has been restored, you must examine the data to see if it is still good. Refer to Customer Support Functions Manuals.

Press Enter to continue

Cmd 9 Cancel

You see screen 43-275 after screen 43-155.

DISK.RECOVER

Screens (continued)

This screen reminds you that DISK.RECOVER puts a backup copy of your file on diskette. Which means that before you can use the file, you must return it to the disk using the Restore option of BACKUP.RESTORE. This screen also reminds you to check the information in your recovered file to see whether any information is missing.

The next screen you will see is 43-255.

Appendix A. Collating sequence table

Introduction

The collating sequence table shows characters (alphabetic, numeric, and special characters) and their position in decimal for the following collating sequences:

- International sequence with no folding (No fold Dia.)
- International sequence with lowercase folded (Fdd L.C.)
- International sequence with lower case and accented letters folded (Fold Dia. and L.C)
- American National Standard Code for Information Interchange (ASCII)
- Extended binary-coded decimal interchange code (EBCDIC—the Native collating sequence.)

For descriptions of each of these collating sequences, refer to the COLSEQ chapter.

How to use the table

To use the table, look for the characters you are interested in (in column 1). Then find their values in one of the six collating sequences in the columns to the right of Character/Position.

For example if you want to know the value for A in the EBCDIC collating sequence, look for A in the Character column. Now look in the EBCDIC column and you will find that 193 is the value for A.

Collating sequence table

Collating sequence table

Character/Position	Nofold Dia.	Fold L.C.	Fold Dia. & L.C.	ASCII	5110/5120	EBCDIC
0	190	190	190	0	64	0
1	191	191	191	1	176	1
2	192	192	192	2	75	2
3	193	193	193	3	76	3
4	194	194	194	4	77	4
5	195	195	195	9	78	5
6	196	196	196	6	187	6
7	197	197	197	127	80	7
8	198	198	198	8	79	8
9	199	199	199	9	91	9
10	200	200	200	10	92	10
11	201	201	201	11	93	11
12	202	202	202	12	94	12
13	203	203	203	13	186	13
14	204	204	204	14	96	14
15	205	205	205	15	97	15
16	206	206	206	16	106	16
17	207	207	207	17	107	17
18	208	208	208	18	108	18
19	209	209	209	19	109	19
20	210	210	210	20	110	20
21	211	211	211	21	111	21
22	212	212	212	8	95	22
23	213	213	213	23	189	23
24	214	214	214	24	121	24
25	215	215	215	25	122	25
26	216	216	216	26	123	26
|	217	217	217	27	124	27
28	218	218	218	28	125	28
29	219	219	219	29	126	29
30	220	220	220	30	127	30
31	221	221	221	31	161	31
┘	222	222	222	32	129	32
┘	223	223	223	33	130	33
┘	224	224	224	34	131	34
35	225	225	225	35	132	35
36	226	226	226	36	133	36
37	227	227	227	10	134	37
38	228	228	228	23	135	38
39	229	229	229	27	136	39
T	230	230	230	40	137	40
┘	231	231	231	41	145	41

Character/Position	Nofold Dia.	Fold L.C.	Fold Dia. & L.C.	ASCII	5110/5120	EBCDIC	
	42	232	232	232	42	146	42
	43	233	233	233	43	147	43
L	44	234	234	234	44	148	44
	45	184	184	184	5	149	45
	46	235	235	235	6	150	46
	47	236	236	236	7	151	47
┘	48	237	237	237	48	152	48
┘	49	238	238	238	49	153	49
	50	239	239	239	22	188	50
	51	240	240	240	51	162	51
-	52	241	241	241	52	163	52
	53	242	242	242	53	164	53
	54	243	243	243	54	165	54
	55	244	244	244	4	166	55
	56	245	245	245	56	167	56
	57	246	246	246	57	168	57
	58	247	247	247	58	169	58
	59	248	248	248	59	74	59
	60	249	249	249	20	144	60
	61	250	250	250	21	159	61
+	62	251	251	251	62	90	62
	63	252	252	252	26	192	63
	64	0	0	0	64	193	64
	65	130	130	130	65	194	65
â	66	5	6	2	66	195	66
ä	67	7	8	2	67	196	67
à	68	3	4	2	68	197	68
á	69	9	10	2	69	198	69
ã	70	11	12	2	70	199	70
ä	71	113	114	2	71	200	71
ç	72	18	19	16	72	201	72
ñ	73	60	61	58	73	178	73
[	74	131	131	131	91	208	74
.	75	132	132	132	46	209	75
<	76	133	133	133	60	210	76
(	77	138	138	138	40	211	77
+	78	116	116	116	43	212	78
!	79	139	139	139	33	213	79
&	80	141	141	141	38	214	80
é	81	26	27	25	81	215	81
ê	82	28	29	25	82	216	82
ë	83	30	31	25	83	217	83

Collating sequence table

Collating sequence table (continued)

Character/Position	Nofold Dia.	Fold L.C.	Fold Dia. & L.C.	ASCII	5110/5120	EBCDIC	
è	84	32	33	25	84	224	84
í	85	48	49	41	85	226	85
î	86	42	43	41	86	227	86
ï	87	44	45	41	87	228	87
ì	88	46	47	41	88	229	88
β	89	83	83	83	89	230	89
]	90	142	142	142	93	231	90
\$	91	143	143	143	36	232	91
*	92	144	144	144	42	233	92
)	93	145	145	145	41	240	93
;	94	146	146	146	59	241	94
^	95	147	147	147	94	242	95
_	96	115	115	115	45	243	96
/	97	148	148	148	47	244	97
Â	98	6	6	2	98	245	98
À	99	8	8	2	99	246	99
Ä	100	4	4	2	100	247	100
Á	101	10	10	2	101	248	101
Å	102	12	12	2	102	249	102
Ä	103	114	114	114	103	142	103
Ç	104	19	19	16	104	104	104
Ñ	105	61	61	53	105	105	105
!	106	149	149	149	124	106	106
,	107	150	150	150	44	107	107
%	108	151	151	151	37	108	108
_	109	152	152	152	95	109	109
>	110	137	137	137	62	110	110
?	111	153	153	153	63	111	111
ø	112	111	112	80	112	112	112
É	113	27	27	25	113	113	113
Ê	114	29	29	25	114	114	114
Ë	115	31	31	25	115	115	115
È	116	33	33	25	116	116	116
Í	117	49	49	41	117	117	117
Î	118	43	43	41	118	118	118
Ï	119	45	45	41	119	119	119
Ì	120	47	47	41	120	120	120
’	121	253	253	253	96	121	121
:	122	155	155	155	58	122	122
#	123	156	156	156	35	113	123
@	124	157	157	157	64	124	124
’	125	158	158	158	39	125	125

Character/Position	Nofold Dia.	Fold L.C.	Fold Dia. & L.C.	ASCII	5110/5120	EBCDIC	
=	126	135	135	135	61	126	126
"	127	159	159	159	34	127	127
Ø	128	112	112	112	128	128	128
a	129	1	2	2	97	129	129
b	130	14	15	15	98	130	130
c	131	16	17	17	99	131	131
c	132	20	21	21	100	132	132
e	133	24	25	25	101	133	133
f	134	34	35	35	102	134	134
g	135	36	37	37	103	135	135
h	136	38	39	39	104	136	136
i	137	40	41	41	105	137	137
<<	138	160	160	160	138	138	138
>>	139	161	161	161	139	139	139
ø	140	22	23	23	140	140	140
ý	141	134	134	134	141	141	141
þ	142	107	108	108	142	142	142
±	143	162	162	162	143	143	143
o	144	163	163	163	144	144	144
j	145	50	51	51	106	145	145
k	146	52	53	53	107	146	146
l	147	54	55	55	108	147	147
m	148	56	57	57	109	148	148
n	149	58	59	59	110	149	149
o	150	62	63	63	111	150	150
p	151	75	75	76	112	151	151
q	152	77	77	78	113	152	152
r	153	79	79	80	114	153	153
ä	154	13	13	13	154	154	154
ø	155	74	74	74	155	155	155
æ	156	109	109	110	156	156	156
ŷ	157	164	164	164	157	157	157
Æ	158	110	110	110	158	158	158
ð	159	165	165	165	159	159	159
μ	160	160	160	160	160	160	160
~	161	167	167	167	126	161	161
s	162	81	82	82	115	162	162
t	163	84	85	85	116	163	163
u	164	86	87	87	117	164	164
v	165	96	97	97	118	165	165
w	166	98	99	99	119	166	166
x	167	100	101	101	120	167	167

Collating sequence table

Collating sequence table (continued)

Character/Position	Nofold dia.	Fold L.C.	Fold Dia. & L.C.	ASCII	5110/5120	EBCDIC	
y	168	102	103	103	121	168	168
z	169	105	106	106	122	169	169
i	170	140	140	140	170	170	170
ı	171	154	154	154	171	171	171
Đ	172	23	23	23	172	172	172
Ÿ	173	168	168	168	173	173	173
ƒ	174	108	108	108	174	174	174
©	175	169	169	169	175	175	175
¢	176	170	170	170	176	176	176
£	177	171	171	171	177	177	177
¥	178	172	172	172	178	178	178
Pt	179	173	173	173	179	179	179
f	180	174	174	174	180	180	180
§	181	175	175	175	181	181	181
¶	182	176	176	176	182	182	182
¼	183	118	118	118	183	183	183
½	184	119	119	119	184	184	184
¾	185	120	120	120	185	185	185
┌	186	177	177	177	186	186	186
|	187	178	178	178	187	187	187
-	188	179	179	179	188	169	188
..	189	180	180	180	189	189	189
´	190	181	181	181	190	190	190
=	191	182	182	182	191	191	191
}	192	183	183	183	192	192	192
A	193	2	2	2	065	193	193
B	194	15	15	15	066	194	194
C	195	17	17	17	067	195	195
D	196	21	21	21	068	196	196
E	197	25	25	25	069	197	197
F	198	35	35	35	070	198	198
G	199	37	37	37	071	199	199
H	200	39	39	39	072	200	200
I	201	41	41	41	073	201	201
-	202	255	255	255	202	202	202
ø	203	64	65	63	203	203	203
ö	204	66	67	63	204	204	204
ò	205	63	69	63	123	205	205
ó	206	70	71	63	206	206	206
õ	207	72	73	63	207	207	207
}	208	185	185	185	125	208	208
J	209	51	51	51	74	209	209

Character/Position	Nofold Dia.	Fold L.C.	Fold Dia. & L.C.	ASCII	5110/5120	EBCDIC	

K	210	53	53	53	75	210	210
L	211	55	55	55	76	211	211
M	212	57	57	57	077	212	212
N	213	59	59	59	078	213	213
O	214	63	63	63	079	214	214
P	215	76	76	76	080	215	215
Q	216	78	78	78	081	216	216
R	217	80	80	80	082	217	217
ı	218	136	136	136	218	218	218
û	219	90	91	87	219	219	219
ü	220	92	93	87	220	220	220
ù	221	93	89	87	221	221	221
ú	222	94	95	87	222	222	222
ÿ	223	104	103	103	223	223	223
\	224	186	186	186	092	224	224
	225	187	187	187	225	225	225
S	226	82	82	82	083	226	226
T	227	85	85	85	084	227	227
U	228	87	87	87	085	228	228
V	229	97	97	97	086	229	229
W	230	99	99	99	087	230	230
X	231	101	101	101	088	231	231
Y	232	103	103	103	089	232	232
Z	233	106	106	106	090	233	233
²	234	189	189	188	234	234	234
Ô	235	65	65	63	235	235	235
Ö	236	67	67	63	236	236	236
Ò	237	69	69	63	237	237	237
Ó	238	71	71	63	238	238	238
Õ	239	73	73	63	239	239	239
0	240	117	117	117	048	240	240
1	241	121	121	121	049	241	241
2	242	122	122	122	050	242	242
3	243	123	123	123	051	243	243
4	244	124	124	124	052	244	244
5	245	125	125	125	053	245	245
6	246	126	126	126	054	246	246
7	247	127	127	127	055	247	247
8	248	128	128	128	056	248	248
9	249	129	129	129	057	249	249
³	250	254	254	254	250	250	250
Û	251	91	91	87	251	251	251
Ü	252	93	93	87	252	252	252
Û	253	89	89	87	253	253	253
Ú	254	95	95	87	254	254	254
	255	189	189	189	255	255	255

Appendix B. LABEL and RECOVER abbreviations

Introduction

This appendix explains the abbreviations used in LABEL and RECOVER screens for:

- Error map label
- Volume label
- System/23 format file labels
- Basic Exchange and H Exchange file labels

The abbreviation CRCNUM is common to screens for all of the above labels. CRCNUM is a cyclic redundancy checking number. It is used as a check to help ensure that you entered data for the RECOVER function exactly as it was shown on the LABEL output. If you enter incorrect data or an incorrect CRC number, error 7200, 7201, 7203, or 7204 occurs, depending on the type of label being recovered. You should then check your entries, correct the data in error, and continue the recovery process.

LABEL and RECOVER abbreviations

Error map label

The following are Error Map Label Abbreviations:

<i>Abbreviation</i>	<i>Meaning</i>
DEFCL1	The number of the first defective cylinder <i>if the diskette has a defective cylinder</i> . Blank if no defective cylinders.
DEFCL2	The number of the second defective cylinder <i>if the diskette has two defective cylinders</i> . Blank if only one defective cylinder or no defective cylinders.

Volume label

The following are volume label abbreviations:

<i>Abbreviation</i>	<i>Meaning</i>
VOLID	The name (volume identification) assigned to the diskette when it was prepared (or the name assigned to it using the VOLID command). Must be 1–6 digits or letters.
OWNERID	The owner identifier assigned to the diskette when it was prepared. Must be 1–14 digits or letters.
VOLSRF	The volume surface indicator, which indicates one of the following recording surfaces: blank one recording surface 2 two recording surfaces M two double-density recording surfaces
PHYRLN	The physical record length, which indicates the length of the physical record on cylinders 1–76. Contains one of the following: blank 128 bytes 1 256 bytes 2 512 bytes

LABEL and RECOVER abbreviations

System/23 format file label

The following are System/23 format file label abbreviations:

Note: Values for System/23 file label fields are in hexadecimal except for FILTYP, DATECR, and DATEUP.

<i>Abbreviation</i>	<i>Meaning</i>
RCDTYP	Record type. Has one of the following values: 01 fixed length records 02 variable length records 03 fixed length records with preceding control byte, permitting deletion
RCDLNG	Record length for fixed length records. For variable length records, this field contains zeros.
RDCDNT	Total record count or total block count for variable length records.
INITBK	Initial block allocation. Number of blocks requested at initial allocation.
DATEUP	Last date the file was updated if the DATE command was used to set the date before you updated the file. Shown in the format yymmdd (year month day). Contains zeros if the date wasn't set when the file was last updated.
PRVCNT	Previous total record count or total block count for variable length records.
KFBCNT	Initial total block count for key-indexed files only. Contains zeros if not a key-indexed file.
KEYLNG	Key length for key-indexed files only. Contains zeros if not a key-indexed file.
DUPFLL	Physical block number of a duplicate file label if one exists. Contains zeros if no duplicate file label.

NUMXNT	The number of extents in the extent space. 1–100 extents are allowed.
FILTYF	File type. This two-digit number indicates the "type" of the file, such as data file, index file, or utility file. See "File types" in the <i>Basic Language Reference</i> for information about file types.
WRTPRT	Write protect indicator. If 01, the file can only be read. If 00, the file can be read from and written to.
KEYPOS	Key position for key-indexed files. (The key position value plus the key length cannot be greater than the record length of the master file.) Contains zeros if not a key-indexed file.
DATECR	Creation date for the file if the DATE command was used to set the date before the file was created. Contains zeros if the date was not set.

LABEL and RECOVER abbreviations

Basic Exchange and H Exchange file labels

The following are Basic Exchange and H Exchange file label abbreviations:

<i>Abbreviation</i>	<i>Meaning</i>
BLKLNG	Block length is the maximum number of characters per block. Must be in the range of 1–128 for Basic Exchange files or in the range of 1–256 for H Exchange files.
BOE	Beginning of extent is the address of the first sector of the file, shown in the format cchss where cc=cylinder, h=head, and ss=sector.
PHYRLN	The physical record length, which indicates the length of the physical record on cylinders 1–76. Contains one of the following: blank 128 bytes 1 256 bytes 2 512 bytes
EOD	End of data is the address of the next unused sector within the file extent. Format is the same as BOE.
EOE	End of Extent is the address of the last sector reserved for the file. Format is the same as BOE and EOD.
WRTPRT	Write protect indicator. P indicates the file can only be read. Blank indicates the file can be read from and written to.
XCHGTP	Exchange type indicator. Blank indicates a Basic Exchange file and H indicates an H Exchange file.

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How to use this index

This index includes entries from both of the Customer Support Functions books—Volume I and Volume II. You are able to tell in which manual an entry can be found by the I or II that precedes the chapter and page number.

For example, let's say that you want to look up something about cancelling a Customer Support Function. First, find the entries that begin with the letter C. Then look for the word *cancelling* in the list of entries. When you find it, you will see that the entry reads:

cancelling a function I.1-22

What this entry tells you is that information about *cancelling a function* is contained in *Customer Support Functions*, Volume I, Chapter 1, on page 1-22. Refer to *Customer Support Functions*, Volume I, Chapter 1, page 1-22 to find information about cancelling a function.

Some index entries refer to pages in both Volumes I and II. Some index entries refer to appendixes. Simply turn to the book, chapter or appendix, and page indicated and you will be able to learn more about the subject.

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How to use this index (continued)

Information about Customer Support Functions is generally indexed by topic. Whenever you need information about a topic in one of the manuals, look up the topic itself. If you need more information or cannot find the topic, look up the Customer Support Function to which the topic refers. In all cases, try to think about the different things a topic can be called and look for each reference in the index.

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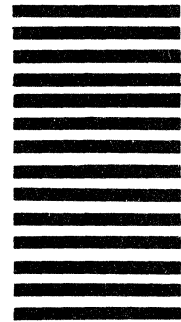
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This Technical Newsletter provides replacement pages for the subject publication. Pages to be inserted and/or removed are:

4-7, 4-8

4-31 through 4-34

X-9, X-10

A technical change to the text or to an illustration is indicated by a vertical line to the left of the change.

Summary of Amendments

1. Revised material on INDEX function in CSF level 5.
2. A revised page of the book index.

Note: Please file this cover letter at the back of the manual to provide a record of changes.



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