

decsystem10

SOS USER'S GUIDE

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SOS USER'S GUIDE

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FOR WHOM THIS MANUAL IS WRITTEN

This manual is written for both the beginning user of the DECsystem-10 and the experienced user starting to learn SOS. You do not have to know how to program, but knowledge of a higher-level language (especially FORTRAN) could only help. This manual assumes you have a project-programmer number and know how to log-in to the system. If you need to know this information, refer to GETTING STARTED WITH DECsystem-10 (DEC-10-XGSDA-A-D).

HOW TO USE THIS MANUAL

First, read the INTRODUCTION to find out what you can accomplish by using SOS. Next, take this manual to a terminal and login to the system (remember, to login you need a project-programmer number and password, which you obtain from the system administrator).

The best approach in using this manual is to start at Chapter 1 and proceed through Chapter 4, typing the commands in each example.

EXAMPLES

In examples, anything you should type is underlined; anything the system types is left alone. In the examples showing the E and W commands, the project programmer number associated with the file is [27,4020]. When you do the examples, your project-programmer number will replace [27,4020].

After reading the first four chapters, you may want to stop and try entering and editing a file of your own. Finally, you should read Chapters 5 and 6, again following each example.

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SYMBOLS USED IN THIS MANUAL

The following table lists all the symbols used in this manual and what they indicate.

Table 1
Symbols Used In This Manual

<u>Symbol</u>	<u>Indicates</u>
—	(Underlining) Anything you type or are expected to type on your terminal. All system printout is left alone.
↪	(Curly arrow) A place where you press or are supposed to press the key labeled RETURN (or CR).
\	(Backslash) A place where you press the RUBOUT (or DELETE) key.
\$	A place where you press the key labeled ESCAPE (or ESC, or ALT).
<LF>	A place where you press the key labeled LINEFEED (or LF).

SOS USER'S GUIDE

INTRODUCTION

USE SOS TO CREATE AND EDIT FILES

A file is a place to store information

A file is a place in the DECsystem-10 where you are allowed to store information. The types of information users commonly store in files are:

1. Programs,
2. Data, and
3. Text.

When creating a file, you must assign it a name and extension for purposes of identification. This name and extension, coupled with an owner's identification called a directory name, distinguish your file from every other file in the system.

Create a file by using an editor

The easiest way to create a file is by using a system program commonly called an editor. Editors, in addition to being able to create files, are capable of changing a file without requiring you to completely retype its contents.

SOS is a line-oriented editor

When you create a file, SOS automatically assigns each line a unique number. To reference that line again, all you have to do is include its line number in the SOS command you are giving.

Some of the functions the SOS commands perform are:

1. Printing lines (P command),
2. Deleting lines (D command),
3. Inserting lines (I command),
4. Replacing lines, i.e. deleting and inserting combined in one command, (R command),
5. Finding parts of your file (F command),
6. Changing part of a line without completely retyping it (S command),
7. Copying lines (C command), and transferring lines (T command) within your file,
8. Ending editing and saving the file on disk storage (E command).

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An editor is a means to an end

Remember, all SOS does is help you prepare a file so you can use it with another program. For instance, you may write a program, then enter it into a file using SOS. To run that program, you must give the EXECUTE command along with the name and extension of the file; just entering the program into a file does not make the system run that program. If the program is to read data, you may enter that data into a second file, again using SOS. The data is not used until you instruct the program to read it from the second file. In short, SOS is a means to an end, not an end in itself.

CHAPTER 1

GETTING YOUR PROGRAM, DATA, OR TEXT INTO A FILE

1.1 STARTING SOS (.SOS)

To start SOS, type SOS, then press the RETURN key. Your terminal leaves a blank line, then prints the word FILE:.

```
.SOS ↵
```

FILE:

SOS will store your program, data, or text in an area inside the computer called a disk file. Each disk file has a name and an extension. The name contains up to six alphanumeric characters (letters and numbers) and the extension up to three. You must separate the name and extension by a period. Five examples of file names and extensions are: CALCS.FOR, SQUARE.ALG, PHONE.CBL, NIM.BAS, and EXIT.TXT.

HINT

If your file is to contain a program, tell the computer which programming language you are using by selecting one of the standard extensions in the table below. If your file contains data or text, you may use any extension. For example, if you write a FORTRAN program, your extension should be .FOR; if you write a COBOL program, your extension should be .CBL.

Table 1-1
Standard File Name Extensions

Language -----	Extension -----
ALGOL	ALG
BASIC	BAS
COBOL	CBL
FORTRAN	FOR

Choose a name and extension for your file (the example uses NUMBER.FOR) After your terminal prints the word FILE:, type the name

GETTING YOUR PROGRAM, DATA, OR TEXT INTO A FILE

and extension you have chosen, then press the RETURN key. If you do not already have a file with this name and extension, your terminal prints the word INPUT:, repeats the name and extension of your file, and prints the number 00100. See the example below. Whatever you type is underlined; anything the terminal prints is left alone.

```
.SOS↵  
FILE: NUMBER.FOR↵  
INPUT: NUMBER.FOR  
00100
```

If you already have a file with this name and extension your terminal prints the word EDIT: (instead of INPUT:) and an asterisk (instead of the number 00100). The word EDIT indicates that you may now make changes to the existing file, instead of creating a new one. If you want to change your file, skip to the beginning of Chapter 3; if you really want to enter a new file, follow the directions in the next section.

To create a new file after receiving the response EDIT:, first tell SOS to forget about changing the old file by typing the "End and Quit" command, EQ. Your terminal prints a period. Start over again by typing SOS, but this time choose a different name and extension. See the example below.

```
.SOS↵  
FILE: NUMBER.FOR↵  
EDIT: NUMBER.FOR  
*EQ↵  
.SOS↵  
FILE: NUMBRE.FOR↵  
INPUT: NUMBRE.FOR  
00100
```

You have now started SOS and are ready to enter the contents of your file.

1.2 ENTERING THE CONTENTS OF A FILE

To enter a program into a file all you have to do is type each line; then end it by pressing the RETURN key. SOS prints the next line number; you type the next line; then press the RETURN key. When you want to stop entering your file, press the ESCape key.

GETTING YOUR PROGRAM, DATA, OR TEXT INTO A FILE

Type the short FORTRAN program in the example below. After you finish typing the last line, proceed to the Section 1.3, entitled "ENDING SOS". Since nobody is a perfect typist, the system provides four aids for correcting typing errors; these are described in sections 1.2.1 through 1.2.4. If you want more information on line numbers, read section 1.2.5.

```
00100      TYPE 101↵
00200      101  FORMAT (' TYPE A NUMBER.')↵
00300      ACCEPT 102,X↵
00400      102  FORMAT (F)↵
00500      TYPE 103,X↵
00600      103  FORMAT (' YOU TYPED ',F)↵
00700      END↵
```

1.2.1 Erasing Characters On The Current Line

To erase the last character that you typed, press the key labeled RUBOUT. Your terminal prints a backslash and the character that you have erased. Press the RUBOUT key once for each successive character that you want to erase; the terminal prints each character as you erase it. When you continue typing, the terminal prints a second backslash to set off and enclose the erased characters. In the example, suppose that you just typed FORMST and want to correct it to be FORMAT.

```
00100      101  FORMST
```

To erase the T, press the RUBOUT key; the terminal prints \T

```
00100      101  FORMST\T
```

To erase the S, press the RUBOUT key again; this time the terminal prints only the S.

```
00100      101  FORMST\TS
```

Next, type an A. The terminal prints a backslash just before the A to enclose the erased characters in backslashes.

```
00100      101  FORMST\TS\A
```

Finally, type the T and you are finished.

```
00100      101  FORMST\TS\AT
```

RUBOUT, CTRL/R, AND CTRL/U

The RUBOUT key, CTRL/R (described in Section 1.2.2), and CTRL/U (described in Section 1.2.3) work only for the line you are currently typing. Once you press the RETURN key, you must use other SOS commands (D,I,R,S, or P) to change or print the line.

GETTING YOUR PROGRAM, DATA, OR TEXT INTO A FILE

1.2.2 Viewing The Line After Erasing

To see the line after you have erased some characters, type a CTRL/R. Your terminal prints the line, but does not indicate the CTRL/R by a printing character. If you want to continue typing after the CTRL/R, do so immediately after the end of the line. You are still permitted to erase.

```
                                CTRL/R
                                ↓
00100  101  FORMST\TS\AT
101    FORMAT
```

CONTROL CHARACTERS

To type a control character, press the key labeled CTRL, and hold it down while you type the character. For a CTRL/U you will press the CTRL key and type a U. The terminal prints most control characters (remember, CTRL/R is not printed) as an up-arrow (^) followed by the character. Thus, CTRL/U (discussed in the next section) appears on your terminal as:

```
^U
```

1.2.3 Erasing An Entire Line

To erase an entire line, type a CTRL/U. Retype its contents on the next line. SOS does not retype the line number.

```
00100  101  FORMST^U
101  FORMAT
```

1.2.4 Starting The File Over Again

If you want to start the file over again, press the key labeled ESC; your terminal prints a dollar sign, then an asterisk. Next, type EQ and press the RETURN key; the terminal prints a period. You can now start all over by typing SOS.

```
001'00  101  FORMST$
*EQ↵
```

GETTING YOUR PROGRAM, DATA, OR TEXT INTO A FILE

1.2.5 Line Numbers

Line numbers are used so you can easily reference each line in your file. Line numbers are NOT part of a program. In particular, the line numbers are not the label that marks the destination of any type of "go to" statement.

When you save your file with an E command, SOS saves the line numbers along with your file; when you give the ES command, SOS strips the line numbers off before saving the file. Some user programs may not recognize line numbers, so it is wise to use the ES command for files that will be read by other programs.

Line numbers consist of five digits followed by a tab. Thus, "column 1" of your file is located immediately following the tab at the end of the line number. This implies that column 1 is really the seventh character of the line. See the example below.

```
                !<= "column 7"
                !
00600   103   FORMAT (' YOU TYPED 'F)
                !
                !<= "column 1"
```

1.3 ENDING SOS

After you have finished typing the program, press the ESC key. The terminal prints a dollar sign, and on the next line, an asterisk.

```
00100           TYPE 101
00200   101   FORMAT (' TYPE A NUMBER.')
00300           ACCEPT 102,X
00400   102   FORMAT (F)
00500           TYPE 103,X
00600   103   FORMAT (' YOU TYPED ',F)
00700           END
00800   $
*
```

To save the file, type E and press the RETURN key. SOS leaves a blank line, prints the name and extension of your file, and then prints a period on the next line.

```
00100           TYPE 101
00200   101   FORMAT (' TYPE A NUMBER.')
00300           ACCEPT 102,X
00400   102   FORMAT (F)
00500           TYPE 103,X
00600   103   FORMAT (' YOU TYPED ',F)
00700           END
00800   $
*E↵
[DSKC:NUMBER.FOR]
```


CHAPTER 2
RUNNING A PROGRAM

Now that you have stored the program in your file, you may run it by giving the EXECUTE command. The EXECUTE command is a system command (not an SOS command) that compiles (or translates) a program into an object program, loads the object program, and then starts the program.

HINT

Check Section 1.1 to make sure you have chosen the correct extension for your program. If you have given the wrong extension, use the system RENAME command to change it. Remember, you can type a system command only after a period. The example shows how to change the name of the file NUMBER.PRG to NUMBER.FOR

```
.RENAME NUMBER.FOR=NUMBER.PRG ↵  
FILES RENAMED: NUMBER.PRG
```

To give the EXECUTE command, type the word EXECUTE, leave a space, type the name and extension of your file, and then press the RETURN key. The example shows how to run the NUMBER.FOR program.

```
.EXECUTE NUMBER.FOR ↵  
FORTRAN: NUMBER  
MAIN.  
LINK:   LOADING  
[LNKXCT NUMBER EXECUTION]  
TYPE A NUMBER.  
23.45 ↵  
YOU TYPED      23.4500000  
  
END OF EXECUTION  
CPU TIME: 0.11  ELAPSED TIME: 29.00  
EXIT
```

If something goes wrong and you want to stop the program, type two CTRL/Cs in succession.

For any additional information, refer to the appropriate language manual and the DECsystem-10 Operating System Commands Manual.

CHAPTER 3

MAKING CHANGES TO YOUR FILE

Now you can make changes to the file you entered in Chapter 1. Start SOS by typing SOS. After the terminal prints FILE:, type the name of your file. This time, SOS responds by printing EDIT:, the name of the file, and an asterisk. Refer to the example below.

```
.SOS↵  
FILE: NUMBER.FOR↵  
EDIT: NUMBER.FOR  
*
```

3.1 PRINTING LINES

To print the contents of the file, type P and press the RETURN key. SOS prints up to 16 lines of your program at one time. In the example, the user's program has only seven lines, so the P command prints the entire program.

```
*P↵  
00100          TYPE 101  
00200  101    FORMAT (' TYPE A NUMBER.')00300          ACCEPT 102,X  
00400  102    FORMAT (F)  
00500          TYPE 103  
00600  103    FORMAT (' YOU TYPED ',F)  
00700          END  
*
```

After printing the lines, your current place in the file is at the last line that SOS printed; in the example that would be line 700. Since your position in the file is moved, if you give a second P command, SOS reprints line 700 and continues with the next 15 lines of your file.

3.1.1 Printing One Line

If you want to print just one line, type a P, the line number of the line, and press the RETURN key.

```
*P500↵  
00500          TYPE 103  
*
```

MAKING CHANGES TO YOUR FILE

LEADING ZEROES IN LINE NUMBERS

Whenever a line number has leading zeroes (such as 00500), you do not have to type them when you give a command which has a line-number argument.

3.1.2 Printing A Group Of Lines

To print a group of lines, type a P, the line number of the first line, a colon, the line number of the last line, and press the RETURN key.

```
*P500:700 ↵  
00500          TYPE 103  
00600 103     FORMAT (' YOU TYPED ',F)  
00700          END  
*
```

3.1.3 Printing The First Line Of Your File

To print the first line of your file, type a P, an up-arrow, and press the RETURN key.

```
*P^ ↵  
00100          TYPE 101  
*
```

3.1.4 Printing The Last Line Of Your File

To print the last line of your file, type a P, an asterisk, and press the RETURN key.

```
*P* ↵  
00700          END  
*
```

3.1.5 Printing The Entire File

To print the entire file, type a P, up-arrow, a colon, and an asterisk, then press the RETURN key.

MAKING CHANGES TO YOUR FILE

```
*p^:*)
00100          TYPE 101
00200  101    FORMAT (' TYPE A NUMBER.')
00300          ACCEPT 102,X
00400  102    FORMAT (F)
00500          TYPE 103
00600  103    FORMAT (' YOU TYPED ',F)
00700          END
*
```

3.1.6 Printing The Current Line

Whenever you print a line or lines, SOS "remembers" the last line it printed. In fact, after every legal SOS command, SOS "remembers" the last line as its current place. To print your current place, type a P, a period, and press the RETURN key.

```
*P.)
00700          END
*
```

3.1.7 Printing The Previous Line - \$

To print the previous line, press the ESCcape key.

```
*$
00600  103    FORMAT (' YOU TYPED ',F)
*
```

3.1.8 Printing The Next Line - <LF>

To print the next line, press the LINEFEED (or LF) key; no character is printed to show you pressed this key.

```
*<LF>
00700          END
*
```

<LF>

The symbol <LF> shows where you would press the LINEFEED (or LF) key.

MAKING CHANGES TO YOUR FILE

3.1.9 Summary Of Print Commands

Table 3-1 summarizes the print commands you have learned up to this point.

Table 3-1
Summary Of Print Commands

*P	Prints the next 16 lines, if possible
*P500	Prints line 500
*P500:700	Prints lines 500 through 700
*P^	Prints the first line in your file
P	Prints the last line in your file
P^:	Prints the entire file
*P.	Prints the current line
*\$	(pressing the ESCape key) Prints the previous line
*<LF>	(pressing the LINEFEED key) Prints the next line

3.2 DELETING LINES

To delete a line, type a D and the appropriate line number; then press the RETURN key. SOS prints a message indicating the line you deleted.

```
*D100↵  
1 LINES (00100/1) DELETED  
*
```

To delete a group of lines, type a D, the number of the first line, a colon, and the number of the last line. Finally, press the RETURN key. SOS prints a message indicating the lines you deleted.

```
*D600:700↵  
2 LINES (00600/1:00700) DELETED  
*
```

HINT

If you should mistakenly delete some lines, you may retrieve them by ending SOS with the EQ command. The disadvantage of giving the EQ command is that you also lose everything else that you did to the file since you gave the last .SOS command. Refer to Section 6.4.

Your place after a D command is at the last line that you deleted.

MAKING CHANGES TO YOUR FILE

3.3 INSERTING LINES

To insert a line, type I, the number of the line you want to insert, and press the RETURN key. SOS types the line number and waits for you to finish typing the line.

```
*I100 ↵  
00100 _____ TYPE 101 ↵  
*
```

INSERTING AN EXISTING LINE

If you already have a line 100 in your file, SOS will choose either line 200 (if it does not already exist), or line 150. If you then try to insert line 150, SOS will choose a line halfway between 150 and 200, which is 175.

When you are at the end of a file, or at a place where line numbers differ by more than 100, SOS allows you to insert more than one line. That is, after you type a line, SOS prints another line number. You type the contents of the line and press the RETURN key. If a conflict arises (such as trying to insert an existing line), then SOS stops inserting lines. If you want to stop this automatic procedure of letting you insert line after line, press the ESCape key to get the asterisk. The example below inserts the last two lines of the program (slightly changing the former line 600).

```
*I600 ↵  
00600 103 FORMAT (' YOU TYPED THE NUMBER ',F) ↵  
00700 _____ END ↵  
00800 $  
*
```

3.4 REPLACING LINES

To delete a line and then insert one directly in its place, type R, the number of the line, and press the RETURN key. SOS prints the line number and waits for you to type the line. Then, after you finish, SOS prints the message just as if you gave a D command.

```
*R200 ↵  
00200 101 FORMAT (' PLEASE TYPE A NUMBER. ') ↵  
1 LINES (00200/1) DELETED  
*
```

MAKING CHANGES TO YOUR FILE

USING THE R COMMAND

Using the R command is exactly like giving a D command directly followed by an I command. First, SOS deletes the line or lines; second, SOS enters input mode. This means that after an R command SOS stays in input mode when you are located at the end of a file or between line numbers that differ by more than 100. To obtain the asterisk, simply press the ESC key to return to command mode.

3.5 ENDING SOS

After you have completed your editing, save the file by typing E and pressing the RETURN key.

*E ↵

[DSKC:NUMBER.FOR[27,4020]

.

CHAPTER 4

CHANGING THE LINE NUMBERS WITHIN YOUR FILE

You will find it much easier to type line numbers if they are even multiples of 10 or 100. The N command renumbers the line numbers in your file.

4.1 RENUMBERING, STARTING WITH 100 AND ADDING 100

To renumber your file, starting with 100 and adding 100 to get each sequential line number, type N and press the RETURN key. After SOS renumbers your file, it leaves you positioned at the end of the file.

The example below shows the user enter three lines - lines 100, 200, and 300. Next, the user enters lines 150 and 250 with two separate I commands. The N command renumbers the file: line 100 is left alone; line 150 becomes the new line 200; line 200 becomes the new line 300; line 250 becomes the new line 400; line 300 becomes the new line 500. After the N command, the user gives the P. command to show his place is at the end of the file. Lastly, he prints out the entire file.

```
.SOS↵
FILE: TEST.TXT↵
INPUT: TEST.TXT
00100  A. RESTON↵
00200  T. SIMOLE↵
00300  L. DELANEY↵
00400  $
*I150↵
00150  S. PATRIARCH↵
*I250↵
00250  E. WHITE↵
*N↵
*P.↵
00500  L. DELANEY
*p^:*↵
00100  A. RESTON
00200  S. PATRIARCH
00300  T. SIMOLE
00400  E. WHITE
00500  L. DELANEY
*
```

When you renumber your file, the lines are kept in exactly the same order.

CHANGING THE LINE NUMBERS WITHIN YOUR FILE

4.2 RENUMBERING, USING A NUMBER OTHER THAN 100

If you want to use some number other than 100, type N, the number you want to use, and press the RETURN key. The example uses the same file as in the example in the previous section.

```
*p^:*  
00100 A. RESTON  
00200 S. PATRIARCH  
00300 T. SIMOLE  
00400 E. WHITE  
00500 L. DELANEY  
*N10  
*p^:*  
00010 A. RESTON  
00020 S. PATRIARCH  
00030 T. SIMOLE  
00040 E. WHITE  
00050 L. DELANEY  
*
```

%WRAP AROUND

If SOS ever prints the message %WRAP AROUND, it has exceeded its maximum line number of 99999 and started at zero again. The lines of your file are in the proper order, but the line numbers are not in sequential order. To fix the line numbers, give the N command with a smaller number than you have previously given.

CHAPTER 5

FINDING, SUBSTITUTING, AND COPYING PARTS OF YOUR FILE

5.1 FINDING PARTS OF YOUR FILE - F

5.1.1 Finding A String Of Characters

To find a string of characters within your file, type an F, type the characters you want to find, press the ESC key, and then press the RETURN key. In the example, use the file NUMBER.FOR and search for the characters ACCEPT.

```
.SOS ↵  
FILE: NUMBER.FOR ↵  
EDIT: NUMBER.FOR  
*FACCEPT$ ↵  
00400          ACCEPT 102,X  
*
```

After searching for a string, you are placed at the line where the characters were found. Thus, a P. command reprints the line containing the string.

```
*P. ↵  
00400          ACCEPT 102,X  
*
```

This form of the F command finds the next occurrence of the string, from the current position through the end of the file. Read Section 5.1.3 to learn how to find a string located anywhere in the file.

5.1.2 SOS Cannot Find The String - %SEARCH FAILS

If we tried to search for the characters HELLO, SOS would not find them and print the message %SEARCH FAILS. In this case, your place is not changed.

```
*FHELLO$ ↵  
%SEARCH FAILS  
*P. ↵  
00400          ACCEPT 102,X  
*
```

FINDING, SUBSTITUTING, AND COPYING PARTS OF YOUR FILE

5.1.3 Finding A String Located Anywhere In The File

To find the first occurrence of a set of characters starting at the beginning of the file and continuing to the end of the file, type F, the characters you are looking for, press the ESC key, type an up-arrow, a colon, and an asterisk, then press the RETURN key.

```
*F101$^:*  
00100      TYPE 101  
*
```

If you want to continue looking for the string, all you have to type is F - SOS remembers the string for which you last looked.

```
*F  
00200  101  FORMAT (' TYPE A NUMBER.')
```

5.2 CHANGING A LINE WITHOUT RETYPING IT - S

To change the contents of a line without completely retyping it, use the S command. For example, the previous contents of line 200 in the program were:

```
00200  101  FORMAT (' TYPE A NUMBER.')
```

using the R command (in Section 3.4) you changed it to:

```
00200  101  FORMAT (' PLEASE TYPE A NUMBER.')
```

by completely retyping the line. Now, add an exclamation point after the word PLEASE, but this time you will not have to retype the entire line. You will search for the word PLEASE and Substitute in its place the word PLEASE!. To give this command, type an S, type the word PLEASE, and press the ESC key. (So far, this command tells SOS to look for the word PLEASE.)

```
*SPLEASE$
```

Continuing on the same line, type PLEASE! and press the ESC key. (Now, the command tells SOS to look for PLEASE and replace it with PLEASE!.)

```
*SPLEASE$PLEASE!$
```

Again on the same line, type the line number 200 and then press the RETURN key. (The 200 tells SOS to perform the substitution only on line 200.) After SOS performs the substitution, it prints the new line.

```
*SPLEASE$PLEASE!$200  
00200  101  FORMAT (' PLEASE! TYPE A NUMBER.')
```

FINDING, SUBSTITUTING, AND COPYING PARTS OF YOUR FILE

5.2.1 SOS Cannot Make The Substitution - %SEARCH FAILS

Sometimes, you might type some characters that are not in the line; in that case, SOS prints the message %SEARCH FAILS and leaves you at your current location. The next example shows what happens if you try to change the word TYPE to CHOOSE, but misspell TYPE as TIPE.

```
*STIPE$CHOOSE$200 ↵  
%SEARCH FAILS  
*
```

5.2.2 Making Substitutions Throughout Your File

You can make substitutions throughout your file. Let's print the entire program and then search for the variable X and replace it with the new variable called NUMBER. To print your entire program, type P, an up-arrow, a colon, and an asterisk, and then press the RETURN key.

```
*P^:* ↵  
00100          TYPE 101  
00200  101    FORMAT (' PLEASE! TYPE A NUMBER.')00300          ACCEPT 102,X  
00400  102    FORMAT (F)  
00500          TYPE 103,X  
00600  103    FORMAT (' YOU TYPED THE NUMBER ',F)  
00700          END  
*
```

To search for the X and substitute the variable NUMBER for it, type S, type an X and press the ESC key (This tells SOS to look for an X.)

```
*SX$
```

On the same line, type the word NUMBER and press the ESC key (This tells SOS to replace the X with NUMBER.)

```
*SX$NUMBER$
```

Finally, type an up-arrow, a colon, and an asterisk; then press the RETURN key. (This tells SOS to perform the substitution over the entire program.) SOS prints each line where it performs the substitution.

```
*SX$NUMBER$^:* ↵  
00300          ACCEPT 102,NUMBER  
00500          TYPE 103,NUMBER  
*
```

FINDING, SUBSTITUTING, AND COPYING PARTS OF YOUR FILE

5.2.3 Choosing The Proper Search String

Searching for the X was easy because X was used for only one thing in the entire program. Since the variable is now an integer, you must change the F inside the parenthesis of the FORMAT statements to an I. You do not want to change the F in the word FORMAT to an I. This means you have to be a little tricky in choosing a unique set of characters to search for and replace.

Notice that each of the F's you want to change to I's just happens to be followed by a right parenthesis-- there is your solution. Search for an F followed by a right parenthesis and substitute an I followed by a right parenthesis; this S command will work over the entire program. The correct S command is:

```
*SF)S)I)$^:*
```

00300	102	FORMAT (I)
00600	103	FORMAT (' YOU TYPED THE NUMBER ',I)

*

In order to use the S command most effectively, you have to notice little tricks such as you used above. If you had just searched for the F and not bothered to use the right parenthesis, SOS would have also changed the F in the word format to an I.

```
*SF$IS^:*
```

00300	102	IORMAT (I)
00600	103	IORMAT (' YOU TYPED THE NUMBER ',I)

*

5.3 COPYING LINES WITHIN YOUR PROGRAM - C AND T

To copy a range of lines from one place in your file to another, type a C and the line number where you want the copied lines to start; leave a comma; then type the range of lines to be copied and press the RETURN key.

For example, suppose you have the file:

```
*P^:*
```

00100	JUMP
00200	JUMPGE
00300	JUMPL
00400	JUMPA
00500	JUMPE
00600	JUMPG

*

and want to put the lines in alphabetical order. The following C command copies lines 400 through 600 to new lines immediately after line 100. Note that since line 100 already exists, SOS inserts the lines immediately after that line. The message INCl=00020 tells you that SOS uses an increment of 20 when selecting new line numbers.

FINDING, SUBSTITUTING, AND COPYING PARTS OF YOUR FILE

```
*C100,400:600 ↵  
INCl=00020  
*P^:* ↵  
00100 JUMP  
00120 JUMPA  
00140 JUMPE  
00160 JUMPG  
00200 JUMPGE  
00300 JUMPL  
00400 JUMPA  
00500 JUMPE  
00600 JUMPG  
*
```

To avoid duplication, you should delete lines 400 through 600. However, to do this automatically, use the Transfer command.

Start with the same file as in the previous example; then give the following T command:

```
*T100,400:600 ↵  
INCl=00020  
*P^:* ↵  
00100 JUMP  
00120 JUMPA  
00140 JUMPE  
00160 JUMPG  
00200 JUMPGE  
00300 JUMPL  
*
```

INCl=ORDER

If you get the message INCl=ORDER, then SOS was not able to choose an increment small enough to fit the lines between the destination line and the next line in the file. However, SOS still copies the lines, but the line numbers are out of sequential order. To preserve the integrity of your file, you MUST IMMEDIATELY give an N command to correctly renumber your file.

In review:

- The C command duplicates the source lines starting at a particular place in the file.
- The T command duplicates the lines and, in addition, deletes them from the source.
- Upon getting the message: INCl=ORDER, always give an N command.

CHAPTER 6

SAVING THE FILE AND ENDING SOS

To end SOS and save your file, use one of the following commands:

1. The E command ends SOS, saving the file along with its line numbers.
2. The ES command strips the line numbers (i.e., unsequences the file), saves the file, and ends SOS.
3. The G command ends SOS, saves the file along with its line numbers, and then executes your last COMPILE, LOAD, EXECUTE, or DEBUG command.
4. The EQ command ends SOS, but does not save the changes to the file.

Also, the W command allows you to save your file and continue editing without ending SOS.

6.1 SAVING THE FILE WITH LINE NUMBERS - E

To end SOS, saving both the file and the line numbers, type E and press the RETURN key. SOS prints the name of the file you have saved and leaves you at command level (signified by the printing of the period).

```
*E ↵  
[DSKC:STATS.DAT[27,4020]]  
.
```

CAUTION

Some programs do not operate properly if you give them an input file that has line numbers. If you find a malfunction of this sort, run SOS, but use the ES command (instead of just E) to remove the line numbers.

SOS automatically renames the original file to file.Qxx. For example, the original STATS.DAT file would be called STATS.QAT after editing,

SAVING THE FILE AND ENDING SOS

thus providing a convenient way to check changes. You may delete a .Qxx file with a system DELETE command, but should only do so after you are sure that you have made the proper changes to the file.

6.2 SAVING THE FILE WITHOUT LINE NUMBERS - ES

To end SOS and strip off the line numbers, type ES and press the RETURN key. SOS removes the line numbers, prints the name of the file, and then leaves you at command level.

```
*ES ↵  
[DSKC:STATS.DAT[27,4020]]  
.
```

The ES command is useful when you are preparing a file that will be read by a program that does not recognize line numbers left in the file by the E command. The ES command also creates a backup file with the extension .Qxx.

6.3 SAVING THE FILE AND EXECUTING THE LAST COMPIL-CLASS COMMAND - G

The G command can save you some typing. Suppose you have previously given the command:

```
.EXECUTE CUBIT.FOR
```

and have since given no other COMPIL, LOAD, EXECUTE, or DEBUG command. (These commands are referred to X as the COMPIL-class commands.) If you then give the G command to end SOS, SOS will save the file and also execute the EXECUTE command. See the example on the next page.

SAVING THE FILE AND ENDING SOS

```
.SOS ↵  
FILE: CUBIT.FOR ↵  
EDIT: CUBIT.FOR  
*S&S) $400 ↵  
00400 102 FORMAT (' TYPE THE NUMBER OF OCCURRENCES: ')  
*G ↵  
  
[DSKC:CUBIT.FOR[27,4020]]  
  
FORTRAN: CUBIT  
MAIN.  
LINK: LOADING  
[LNKSCT CUBIT EXECUTION]  
TYPE THE NUMBER OF OCCURRENCES: 34 ↵  
THANK-YOU  
  
STOP  
  
END OF EXECUTION  
CPU TIME: 0.08 ELAPSED TIME: 3:15.13  
EXIT
```

The G command also creates a backup file with the extension .Qxx.

6.4 ENDING WITHOUT SAVING YOUR WORK - EQ

To end SOS without saving the work you did, type EQ and press the RETURN key.

```
*EQ ↵
```

The EQ command does not save the work you did since you gave the last .SOS command. This means that if you created a file, it is now gone, or if you edited a file, this last set of edits is gone. Since SOS does not have to do any work, the EQ command operates very quickly.

The EQ command is useful in the following circumstances:

1. When you have used SOS to merely read through a file, there is no reason to resave it because you have not made any changes. In this case, SOS leaves the file untouched.

SAVING THE FILE AND ENDING SOS

2. After you have given a command that makes your file useless, you can give the EQ command to eliminate all you have done to the file. For example, suppose you gave a D command by mistake. If it is worth losing the edits you have just made, you can give the EQ command and recover the lines you lost. Also, if you want to try a particular S command, you can start SOS (or give a W command) and try the S command. Then if the command does not work the desired way, give an EQ command and you will have the original file.

The EQ command does not create a backup file.

6.5 SAVING THE FILE WITHOUT ENDING SOS - W

The W command saves your file, but lets you continue editing without stopping SOS. It is good practice to give a W command every 15 minutes or so. That way you are sure of retaining your work no matter what happens. Many SOS users also agree on another basic rule of editing - never walk away from your terminal without giving a W (or an E) command to protect yourself from a naive person who might type an EQ command.

To give the W command, simply type a W and press the RETURN key. SOS prints the name of the file and leaves you in edit mode.

```
*W ↵  
[DSKC:STATS.DAT[27,4020]]  
*
```

The W command creates a backup file with the extension .Qxx.

APPENDIX A

SUMMARY OF SOS COMMANDS

Table A-1 describes the symbols used for line numbers, and Table A-2 describes the SOS commands described in this manual.

Table A-1
Symbols Used For Line Numbers

Symbol -----	Means -----
^	First line
.	Current line
*	Last line

Table A-2
Summary Of SOS Commands

Command -----	Function -----
RUBOUT	Deletes one character from the current line. *MTHIS\S
CTRL/R	Prints the current line. 00300 THIS IS THE CTRL/R EXAMPLE THIS IS THE CTRL/R EXAMPLE
CTRL/U	Deletes the current line. 00500 CTRL/U DELETES THE CURRENT
\$	1 - Prints the previous line. *\$ 00100 C THIS IS THE START OF IT. *
	2 - Ends input mode 00300 THIS IS THE LAST LINE. 00400 \$ *

SUMMARY OF SOS COMMANDS

<LF>	Prints the next line in the file. *<LF> 00700 BEL: OUTSTR [7] *
Cline1,line2:line3	Copies lines from line2 through line3 to the lines following line1. *C200:400:800 *
Dline1:line2	Deletes from line1 to line2. *D400:700 4 LINES (00400/1:00700) DELETED
E	Saves the file and ends SOS. *E [DSKC:STATS.FOR[27,4020]] .
ES	Saves the file without line numbers. *ES [DSKC:STATS.FOR[27,4020]]
EQ	Ends SOS without saving the file. *EQ .
Fstring\$line1:line2	Prints the first line located between line1 and line2 which contains the string of characters. *FNEWER\$400:10300 002300 NEWER FILES WILL BE SAVED ON *
G	Saves the file, ends SOS, and executes the last COMPIL, LOAD, EXECUTE, or DEBUG command. *G [DSKC:STATS.FOR[27,4020]] the last COMPIL-class command is executed at this point.
Iline1	Starts insert mode for line1. *I500 00500 104 FORMAT (' DIST= ',(F)) 00600 \$ *
Nnumber	Numbers a file starting with number and adding number to produce subsequent line numbers. *N20 *

SUMMARY OF SOS COMMANDS

Plinel:line2	Prints the contents of the file from line1 through line2. *P100:300 00100 TYPE 101 00200 101 FORMAT (' HELLO.')
	00300 END *
Rline1:line2	Deletes from line1 through line2 and then starts inserting at line1. *R100:200 00100 TYPE 105 00200 105 FORMAT (' GOODBYE.')
	2 LINES (00100/1:00200) DELETED *
Sstring1\$string2\$11:12	Finds all occurrences of string1 between lines 11 and 12 and then replaces string1 with the new string2. *STHAN\$THEN\$100:800 00700 THEN, HE BETTER GET READY FOR
	*
Tline1,line2:line3	Copies from line2 through line3 to line1, then deletes from line2 through line3. *T100,400:500 *
W	Saves the file, but does not end SOS. *W [DSKC:STATS.FOR[27,4020]] *

APPENDIX B
SOS ERROR MESSAGES

In the course of using SOS, you will probably encounter some error messages. An error message preceded by a question mark (?) is a fatal error after which SOS stops without saving your file. To recover the most recent version of your file, look at the backup file with the same name as your file and the extension .Qxx, where xx is the last two letters of your extension. An error message preceded by a percent sign (%) is a warning message, you should take the recommended corrective action or reissue the command.

? CANNOT EDIT FILE WITH PROT .GT. 400

The file you indicated has a system protection greater than <400>. To edit the file, give the command .PROTECT file.ext which will change the protection to <155>.

? DEVICE INPUT ERROR

A system problem has occurred. You will not lose any edits after this type of error. Restart SOS and if the problem persists, contact the operator.

? DEVICE OUTPUT ERROR

Most likely you will be saving a file when this system problem occurs. STOP immediately and contact the operator. The edits you have made are not stored in the most recent version of the file, but an experienced SOS user or a system programmer has a reasonable chance of recovering them.

% ILLEGAL COMMAND

This message indicates that you typed an incorrect syntax to the command. Most likely the punctuation is wrong or an alphabetic character has found its way into a line number. Examine the command and reissue it.

SOS ERROR MESSAGES

% ILLEGAL LINE FORMAT

SOS has found a line with a non-standard internal format. Most likely, this file is not meant for editing and you should give an EQ command to return to system command level. If you must edit the file, contact the operator and describe your problem.

% ILLEGAL REPLACEMENT ON INSERT

You have tried to insert a line that already exists in the file and SOS cannot fit a line between the indicated line and the next line in the file. To insert that line, give the N command to renumber your file; find your place again; then reissue the I command.

% ILLEGAL TRANSFER DESTINATION

In giving the T command, you have indicated a destination line either that does not exist or that is in the source range. Examine the T command and try again.

? ILLEGAL UO

There is an internal SOS error. Your edits will be lost on this fatal error unless you stop and contact the operator to try to restore your file.

% INCL=ORDER

During a copy, transfer, or number command, SOS had to insert line numbers which were out of numerical order. To maintain the integrity of your file IMMEDIATELY give a N command to put the lines in numerical order. If you then get the message % OUT OF ORDER, use a smaller number with the N command.

% INSUFFICIENT CORE AVAILABLE

There is not enough system space to do the operation you require. Generally this occurs in the execution of a large C command. Split the source range into smaller portions and try the copy or transfer in smaller segments.

? INTERNAL CONFUSION

There is an internal problem with SOS and your edits will be lost. Contact the operator to try to restore your file; otherwise, use the backup file with the name file.Qxx.

SOS ERROR MESSAGES

% LINE TOO LONG

SOS permits lines up to 500 characters in length, but you have exceeded this length. The I command that caused this error is canceled and the inserts are not done. Try inserting the contents on more than one line.

? NO DISK AVAILABLE. PLEASE CHECK THE DISK YOU HAVE REQUESTED.

Most likely you are working on a private disk that has just been removed from the system. Contact the operator to correct any possible problems; then give the REENTER command and try to save your file again.

% NO NEXT LINE

You have attempted to print the next line in the file but you are positioned at the end of the file.

% NO STRING GIVEN

An F or S command has been given without specifying the string to be found and the command has been canceled. Reissue the command with the proper search string.

% NO SUCH LINE(S)

The line you indicated in the last command does not exist. Reissue the command with the proper line number.

% OUT OF ORDER

In copying or transferring lines, SOS has properly moved the lines, but their line numbers are not in increasing order. The contents of the lines are in proper order, but the numbers are not in ascending sequence. Give an N command with a smaller increment than is presently used.

% SEARCH FAILS

In giving a F or S command the search string has not been found and your place in the file has not changed.

% STRING TOO LONG

The search string in an F or S command is longer than the maximum of 200 characters. Try using a smaller string.

SOS ERROR MESSAGES

% WRAP AROUND

In renumbering the file, SOS reached its maximum of 99999. The contents of the lines are in proper order, but the line numbers are not in an ascending sequence. Give the N command with a smaller number.

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READER'S COMMENTS

NOTE: This form is for document comments only. Problems with software should be reported on a Software Problem Report (SPR) form (see the HOW TO OBTAIN SOFTWARE INFORMATION page).

Did you find errors in this manual? If so, specify by page.

Did you find this manual understandable, usable, and well-organized? Please make suggestions for improvement.

Is there sufficient documentation on associated system programs required for use of the software described in this manual? If not, what material is missing and where should it be placed?

Please indicate the type of user/reader that you most nearly represent.

- Assembly language programmer
- Higher-level language programmer
- Occasional programmer (experienced)
- User with little programming experience
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