

USERS GUIDE

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A SMALL OPERATING SYSTEM

for the

64K EXTENDED DISK BASIC - COLOR COMPUTER

Version 1.11

Copyright (C) 1985

by

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This section provides the user with a complete description of each command and the specific format requirements for each. This includes any parameters needed and ways the commands may be used or specific suggestions for keeping things organized. We will also note any particular caution or warning we feel is appropriate to try to keep you out of trouble. Once you are familiar with the commands you will probably only need to refer to the Command List in SECTION VIII.

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This section will explain how to get S.O.S. up and running on your particular system. It will provide the necessary customization required for your particular disk drives, printer etc. This section will only be required to initially setup your system unless you add new equipment or desire to make changes in the configuration.

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In this section we will provide you with some of the more important variables and vectors. For a complete list however we are presently working on a PROGRAMMERS REFERENCE GUIDE (see note at the end of SECTION VII).

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This is a list of all the commands provided here as a quick reference guide.

SECTION I INTRODUCTION

S.O.S is a SMALL OPERATING SYSTEM that only operates on a 64K EXTENDED DISK BASIC COLOR COMPUTER. Once installed and running it is independent of the ROM version of your computer. It is a complete driver for the screen, keyboard, printer and disk drives. It greatly improves assembly language programming on the COLOR COMPUTER. It leaves approximately 54,000 bytes of working space and still provides improved routines for I/O. For example, it can send either 7 or 8 bits to the printer with either 1 or 2 stop bits at any of the standard baud rates and will send either line feed or carriage return or both at the end of each line. The installation program will allow you to make these selections.

There are many additional capabilities available in the screen driver, such as the one that allows for clearing any part of the screen to protect other areas, or the ability to fill a part of the screen with a particular character. There are also routines for printing a string which is terminated with a zero, or a routine that will clear the screen first and if desired will output one or two carriage returns before outputting the string.

The keyboard driver has some enhancements that you may find very useful. One example is the line input routine that allows for setting the number of characters to be input by loading the A register with the count before calling the routine. This number can be from 0 to 255. There is also a routine to blink the cursor, wait for a key and send it to the screen if it is a printable character. A table is included for all the special keys <BREAK>, <ENTER>, etc. as well as space for four function keys (such as those found on the HJL or similiar keyboard). Any value can be assigned to these keys or you can put a zero in the table and they will do nothing. If you do have an HJL keyboard the <F2> (repeat) key will function, as S.O.S. is already setup for this.

The disk driver is significantly more flexible. It will handle mixed drives of 35,40 or 80 Tracks and single or double sided. The installation program will allow you to assign 8 sides in any combination of single or double sided drives. It is highly recommended that you have at least one 35 or 40 track drive for COLOR COMPUTER - BASIC compatability and for loading software programs that you have purchased.

The disk routines support both sequential and random files. For random files the smallest record size is 10 bytes and the largest is 256 bytes. On an 80 Track drive that would allow for over 32,000 records in one file.

There are three utilities provided with S.O.S., they are BACKUP, COPY, and FORMAT. These utilities are necessary to fully utilize more than 35 tracks and to use both sides of double sided drives. Refer to SECTION V for complete details.

The BACKUP program is very efficient and is capable of backup from one side to the other of the same drive and will also do a backup on a single drive system.

The COPY program allows you to copy from one side to another of the same drive, or copy files from 40 Track to 80 Track or vice versa. We have also incorporated Wildcard copying to improve disk operations.

The FORMAT program will format your diskettes according to the number of tracks you specified at installation. The format is double density and is compatible with that used by RADIO SHACK.

S.O.S. has many commands which are similar to those you have used in BASIC however all commands apply only to machine language programs. BASIC is not supported in S.O.S., sound and graphics can only be utilized through machine language routines provided by the user.

We have tried to maintain as much compatibility with existing routines as possible by utilizing the same registers and the same variable locations wherever feasible. A major Feature however is the provision of 93 vectors for utilizing routines within the operating system.

You will find that the conversion of existing software is not too difficult a task in most instances (there are exceptions of course). At this writing we have successfully converted MICRO WORKS - EDITOR/ASSEMBLER/DISASSEMBLER, ELITE-WORD, TELEWRITER 64, AND CLRTERM. Our main thrust initially was to provide an environment for an editor-assembler that would allow for much larger programs to be written. The MICRO WORKS EDITOR operating under S.O.S. has nearly 49K of text space available. Each program converted has been able to take full advantage of the improved disk capabilities and other I/O improvements.

As S.O.S. becomes more popular we expect the number of programs converted to grow so that it becomes more and more useful. Some conversions will come from you the user as you convert your existing software and perhaps release the patches to others and additionally we hope that some new software will be written specifically for S.O.S. We currently have under development patches for RADIO SHACK'S EDITASM and SCRIPSIT, COMPUTERWARE'S EDITOR - ASSEMBLER, DEFT'S PASCAL, and DUGGER'S GROWING SYSTEMS C.

SECTION II ENTERING COMMANDS

All commands are entered from the main command screen of S.O.S. by typing two upper case characters and pressing <ENTER>. You cannot enter more than two characters, it will just BEEP when you try. If the two characters do not represent a valid command it will also BEEP and clear the entry and wait for you to try again. All the commands consist of either the first two characters of the command word or the first character of each of a two word command. Details of each command are presented in SECTION III.

Let's make a note here about the DATE as this is the first thing you will encounter when you bring up S.O.S. You are normally expected here to enter a date in the form 06/18/85 and this date will be written in the directory for any files you create. This date will also be displayed on the main command screen. You do not of course have to enter the date in this variable you may enter any eight characters you like (see DATE CHANGE command for more details).

Any commands that are potentially destructive, such as RETURN to BASIC or ZERO MEMORY will ask you SURE ?? to give you a chance to confirm your intentions or change your mind. An exception to this would be the SAVE command which will overwrite the existing file of the same name without asking you, so be careful.

There are three utilities provided with S.O.S. they are BACKUP, COPY and FORMAT. These are not commands but are initiated with the RUN command. These will take a few seconds to load but we didn't want to give up the space to make them resident.

SECTION III COMMAND LIST

- 1: < CL > CLOSE
- 2: < DC > DATE CHANGE
- 3: < DD > DEFAULT DRIVE
- 4: < DI > DIRECTORY
- 5: < DL > DATA LOAD
- 6: < DM > DISPLAY MEMORY
- 7: < DS > DATA SAVE
- 8: < EX > EXECUTE
- 9: < FG > FREE GRANULES
- 10: < FI > FILES
- 11: < KI > KILL
- 12: < LO > LOAD
- 13: < OP > OPEN
- 14: < PE > PRINT ERROR
- 15: < PP > PARALLEL PRINT
- 16: < RB > RETURN to BASIC
- 17: < RE > RENAME
- 18: < RU > RUN
- 19: < SA > SAVE
- 20: < ZM > ZERO MEMORY

DESCRIPTION OF COMMANDS

NOTE: The <BREAK> key will abort all commands !!

1: < CL > CLOSE

The CLOSE command screen will allow you to enter a file number from one <1> to <15> or an <A> for ALL. An <A> will close all the open files whereas if a file number is entered only that particular file will be closed. Press <ENTER> to execute the command or press the <BREAK> key to ABORT and return to the command screen.

Trying to close a file number which is higher than the number of files allocated will cause an error. See FILES command for allocation of files. Trying to close a file which may already be closed will not cause any problem nor will you be given any messages to that effect.

2: < DC > DATE CHANGE

The DATE CHANGE command screen will display the current DATE or other information that has been entered in the eight character string variable and wait for you to enter new data. At this point you may press <ENTER> to accept what is displayed or you may enter new data and press <ENTER> to save the changes or at any point you may press <BREAK> to ABORT and not save the changes.

Any eight characters may be entered and saved in this variable normally used for the date in the form 06/13/85. These eight characters will be written in the directory entry when a file is saved by S.O.S. and is convenient for dating or otherwise identifying your files. This identifying data will only be displayed by S.O.S. under the DIRECTORY command, even though it does not cause a conflict it will not be displayed under BASIC. Files created under BASIC will be displayed with dashes in this field.

3: < DD > DEFAULT DRIVE

The DEFAULT DRIVE command screen displays the current Default Drive and at this point you may just press <ENTER> to accept the current drive or you may enter a new drive number and press <ENTER> to change the DEFAULT DRIVE.

4: < DI > DIRECTORY

The DIRECTORY command screen will display the current Default Drive and if you just press <ENTER> the directory for that drive will be displayed. If you wish you may enter any drive number and press <ENTER> to display the directory for a different drive.

The Directory Display will consist of the Drive number, the number of Free Granules and the Directory entries, up to a maximum of eight. This will continue as you press <ENTER> until all the entries have been displayed. If you press <BREAK> at any point you will exit the Directory command and return to the Main Command screen. When all directory entries have been displayed pressing enter will return you to the Main Command screen.

5: < DL > DATA LOAD

The DATA LOAD command loads a single continuous block of data into memory from a disk file. This provides a faster load for a single block of data because it uses only the addresses you provide and does not check for preambles or postambles.

The first screen to be displayed requires you to enter the FIRST and LAST addresses in the form FFFF/LLLL/0000/ Since only the data was saved, without addresses, you must supply the correct addresses. You may use this for executable programs however, in this case you would use the EXECUTE command to enter the execute address and run the program.

The next screen to be displayed is the one that expects you to enter the FILENAME and any other parameters that may be necessary. If you enter only the filename and press <ENTER> the defaults are as follows:

< EXT >	=	DAT
< DRV >	=	Default Drive
< OFST/RCSZ >	=	Not applicable
< File # >	=	First available
< Type >	=	"I" Input

You may enter any of these parameters, according to the appropriate format specified, in any order after the filename.

6: < DM > DISPLAY MEMORY

The DISPLAY MEMORY command does exactly what the name implies and it also provides for changing data for making patches or changing variables on the fly. The screen for this command requires you to enter a HEX address. The data for that address will be displayed along with the four bytes before and the four bytes after that address. You should find this very useful, especially if you are looking at or patching a machine language program with three or four byte instructions.

You may step through memory in either direction using the arrow keys. You may use the (left/right) or the (up/down) which ever feels more comfortable to you. These keys will repeat if you hold them down. To enter a new address press <M> and you can enter another address. To return to the main command screen press <BREAK>.

To change data at the address displayed simply enter any valid two digit HEX data, the byte of data above the cursor will change and the address will automatically be incremented so that you may change the next byte if desired. This is especially useful for hand coding or patching.

Use CAUTION when changing data; there are no restrictions as to where you make changes. This means you can change S.O.S., but it also means you can make changes that might crash. You might want to temporarily change a variable in S.O.S. however remember that you must return it to its original value unless you want to return to BASIC and restart S.O.S.

7: < DS > DATA SAVE

The DATA SAVE command saves a single continuous block of data from memory to a disk. This provides a file which will load a single block of data faster because it uses only the addresses you provide and does not check for preambles or postambles (see DATA LOAD).

The first screen to be displayed requires you to enter the FIRST and LAST addresses in the form FFFF/LLLL/0000/ Only the data will be saved between the FIRST and LAST addresses you specify. Since this file will be without addresses, you must supply the correct addresses when you load it (see DATA LOAD).

The next screen to be displayed is the one that expects you to enter the FILENAME and any other parameters that may be necessary. If you enter only the filename and press <ENTER> the defaults are as follows:

< EXT >	= DAT
< DRV >	= Default Drive
< OFST/RCSZ >	= Not applicable
< File # >	= First available
< Type >	= "O" Output

You may enter any of these parameters, according to the appropriate format specified, in any order after the filename.

8: < EX > EXECUTE

The EXECUTE command screen will display the execute address that is currently stored at \$9D. You may just press <ENTER> to execute the program at that address or you may enter a new address and press <ENTER> to store this address at \$9D and jump to that address.

Please NOTE that to LOAD and EXECUTE a normal program we have provided a RUN command for machine language programs. This is equivalent to the RUN command in BASIC for running BASIC programs.

If you are not sure about the exact execute address be careful. To abort this command just press <BREAK>.

9: < FG > FREE GRANULES

The FREE command screen will display the current Default Drive and if you just press < ENTER > the free granules for that drive will be displayed. If you wish to display the free granules for a different drive you may enter any drive number and press <ENTER>.

10: < FI > FILES

The FILES command as the name implies allows you to change the number of files and file space allocated. The FILES command screen permits you to enter a number from 1 to 15. At startup the number of files is set to three.

11: < KI > KILL

The KILL command screen is the soon to be familiar filename screen (it is used in many of the commands). You must enter the FILENAME and the EXTENSION (nothing here is assumed). If the file to be killed is not on the default drive then of course the DRIVE NUMBER must also be entered.

As is the case for most of the commands you may press <BREAK> to abort if you have changed your mind for any reason.

12: < LO > LOAD

The LOAD command is provided for the normal loading of a machine language program. It will load any binary file that has been saved using the SAVE command or otherwise contains preambles and postambles. It will load a file with more than one non-contiguous block of data whether it is an executable program or not.

The LOAD command screen is the Filename screen. If you enter only the FILENAME and press <ENTER> the defaults are as follows:

< EXT >	= BIN
< DRV >	= Default Drive
< OFST/RCSZ >	= ZERO Offset
< File # >	= First available
< Type >	= "I" INPUT

You may enter any of these parameters, according to the appropriate format specified, in any order after the FILENAME.

13: < OP > OPEN

The OPEN command screen which again is the Filename screen allows you to enter the filename and additional parameters to open a file for Sequential access (Input or Output) or for Random access (Read and Write).

If you open a file for Output which already exists it will be overwritten with no backup automatically generated.

The default values for the OPEN command are as follows:

< EXT >	=	BIN
< DRV >	=	Default Drive
< OFST/RCSZ >	=	\$0000 (Input) / \$0100 (Random)
< File # >	=	First available
< Type >	=	"I" Input

You may enter any of these parameters, according to the format specified, in any order after the FILENAME. Note that the Offset or Record Size as applicable must be entered as a four digit HEX number and the minimum record size that you may specify is \$000A or 10 bytes.

If you make an error in entering the filename or the other parameters the data you have entered will be cleared, you will hear a BEEP and you will be required to enter it again. At any point in the filename screen you may press <BREAK> to ABORT the command and return to the Main command screen.

14: < PE > PRINT ERROR

The PRINT ERROR command is a sort of on-line HELP command that will give you a short description of the CURRENT error number that is displayed on the Main Command Screen. As you use S.O.S. more and more, you will become familiar with some of the error numbers. The <PE> command will help you to learn these and will display for you any you don't remember. The messages are limited to 25 characters each, but are long enough to give you an understandable message.

The <PE> command will ONLY work if there is an error number CURRENTLY on the Main Command Screen.

It is possible even if an error has not occurred to get the message for a particular error number if you first go to the <DM> DISPLAY MEMORY command and enter the error number in hex location \$FE.

NOTE: Although the error numbers appear to be decimal numbers 10 to 39, you must enter them in location \$FE as a HEX number. So error number 24 will get entered as \$24 at location \$FE.

Then press the "R" key to return to the Main Command Screen and the error number will now display as though an error had occurred. Use the <PE> command now to display the message for that error number.

NOTE: There is one condition under which you will not get a message, but another error (NO. 34).

When the file "SOSMSG/MSG" is not on the disk in Drive 0 or the file is not in granule 0. The INSTALL program will always put this file in that location for you. If you create a disk of your own then you will have to make sure that you FIRST copy "SOSMSG/MSG" to a blank disk and you will have to use S.O.S. to copy it. After that it doesn't matter what files you put on the disk or what order you do it in.

15: < PP > PARALLEL PRINT

The PARALLEL PRINT command has no command screen, it simply toggles a print flag ON or OFF alternately. When the Parallel Print Flag is ON any character sent to the screen via the screen driver will also be directed to the printer driver to be printed. Of course this will not apply if a character is stored direct to screen RAM by some other means.

This command can be useful for printing the directory if you turn ON the Parallel Print Flag just prior to a DIRECTORY command.

NOTE: The printer should be ready when you turn on this flag.

If it is not, when it tries to send the first character to the printer you will get a message at the bottom of your screen that says PRINTER NOT READY. At this point you will probably not get out of this unless you can make the printer ready, other than a RESET or power-down and restart. If the RESET does work you may still have some files to close and some variables to restore, depending on what you were doing at the time.

16: < RB > RETURN to BASIC

The RETURN to BASIC command does exactly what it says and will ask you if you are SURE ?? . Only a <Y> will return you to BASIC.

This command executes a COLD START to BASIC, so be sure you have saved everything before executing it. This command was only provided to allow you to return to BASIC without powering off. To return to S.O.S. you must RUN "SOS" from BASIC.

17: < RE > RENAME

The RENAME command screen is the Filename screen and it will be displayed twice. The first time you will enter the OLD FILENAME/EXT, and Drive number if necessary. At this point S.O.S. will verify that this file exists. If it does not find the file you will be returned to the main command screen with an error. If it does exist the Filename screen will now display again so that you may enter the NEW FILENAME/EXT (a Drive number here would be ignored).

18: < RU > RUN

The RUN command is provided to allow you to LOAD and EXECUTE a machine language program with a single command. The RUN command screen once again is the Filename screen. At this point you would normally enter only the FILENAME, however, you may want to enter a drive number if the program is not on the Default Drive. The extension that is expected here is SOS. We chose this so that you would not inadvertently try to run programs that had not been converted to run under S.O.S.

You will get an error of course if the file you have named is not a BINARY file and you will no doubt CRASH if the file is not an executable program or has not been designed or otherwise modified to run under S.O.S.

19: < SA > SAVE

The SAVE command provided here is somewhat different than the SAVEM you may be accustomed to in BASIC. This command will allow you to save NON-CONTIGUOUS blocks from memory into a single file.

The SAVE command screen to be displayed first is the Address screen. Here you are expected to enter (in HEX) the FIRST, LAST, and EXECUTE addresses in the form FFFF/LLLL/EEEE/. Three entries are required as are the slashes.

If this file has multiple blocks of data, then the third entry will not be an EXECUTE address but instead you should enter a plus (+) sign and three zeroes to indicate that another block is to follow after this block is saved. The entry in this case will be of the form FFFF/LLLL/+000/.

If you have entered the addresses correctly, the next screen you will see will be the Filename screen. If not, they will be cleared from the screen, you will hear a BEEP and you will be required to enter them again.

If you enter only the FILENAME and press <ENTER> the following defaults apply:

< EXT >	=	BIN
< DRV >	=	Default Drive
< OFST/RCSZ >	=	Not applicable
< File # >	=	First available
< Type >	=	"O" Output

You may enter any of these parameters, according to the format specified, in any order after the FILENAME.

When you press <ENTER> the directory entry will be written, the first block will be saved and if there are more blocks to follow you will be returned to the Address screen as described above. Continue until you have entered the addresses for the last block and remember that the third entry for the last block must contain the EXECUTE address.

CAUTION: If this is not an executable program then we suggest a dummy address such as \$011D for the EXECUTE address as this will prevent a CRASH if you try to RUN this file.

If you make any errors in address format or in the filename or parameters the data you have entered will be cleared and you must enter it again.

The <BREAK> key will abort this command while in the Address screen or in the Filename screen however; remember that you may have already saved parts of a file which you may want to KILL if what you have saved is not usable.

20: < ZM > ZERO MEMORY

The ZERO MEMORY command screen will display the question " SURE ?? <Y/N> " to allow you to confirm your intentions or change your mind. Any response other than a <Y> will ABORT this command.

This command stores zeroes in memory from the address in \$001F (start of User RAM) to the address in \$0074 (end of User RAM). At start-up these addresses are \$0CD4 and \$E000 respectively with three files being allocated at start-up.

SECTION IV INSTALLATION OF S.O.S.

FIRST !! You MUST have a <BLANK><FORMATTED> disk ready when you start the INSTALL program.

SECOND !! Do NOT do ANYTHING with the ORIGINAL disk except to make a BACKUP COPY of it. Label this backup copy the INSTALL DISK. This is the one you will use to create the SYSTEM DISK.

Of course, we expect that you will ONLY make copies FOR YOUR OWN USE!! We don't think its fair when the LEGITIMATE owner can not make backup copies of HIS OWN software. This means that YOU are our copy protection system. So let's help each other. We'll do our best to protect your purchase and you do your best to protect our product.

OK, now on to the INSTALL program and how to use it. The INSTALL program will take your <BLANK><FORMATTED> disk (you'll be told when to insert it) and put all the necessary files on it for a CONFIGURED S.O.S. disk (SYSTEM DISK). There are basically TWO ways to run INSTALL and get a configured disk. The FIRST is to accept ALL DEFAULTS. This is the way you should create your first SYSTEM DISK. The SECOND method is to tell INSTALL that you want to configure S.O.S. yourself. There are two sections to the configuration process. The first section will configure S.O.S. for all the I/O except the disk drives, and the second section will configure S.O.S. for the disk drives. You may CONFIGURE either section while accepting the defaults for the other section.

**** CAUTION **** If you do configure your disk drives for more than 35 tracks or for a step rate faster than 30 milliseconds and your drives can not handle the extra tracks or speed, then INSTALL may not be able to complete the installation, because it uses the new configuration to put the necessary files on your new disk. This is why we feel you should first do a DEFAULT configuration. Then if you READ the ENTIRE set of configuration instructions we will tell you how to test your drives for more than 35 Tracks and for faster than 30 millisecond step rate.

Once the INSTALL program is done it will tell you to remove and protect the disk it has just created. This now becomes your SYSTEM DISK and you should now use BASIC to COPY the following files COPY/SOS, FORMAT/SOS, AND BACKUP/SOS from the INSTALL DISK to your new SYSTEM DISK.

NEXT it would be advisable to (RUN) "SOS" and use the S.O.S. utilities to FORMAT a new disk and make backup copies of your SYSTEM DISK. Use <COPY> "WILDCARD" (*) to make your backup copies. DO NOT use BASIC, as the SOSMSG/MSG file must go in the first granule and S.O.S. will put (keep) it there.

NOTE: You could use BACKUP to make those copies only if you are staying with 35 Tracks. To create a SYSTEM DISK with 40 or 80 Tracks you must use COPY to get it from the 35 Track disk you just created. We also recommend backing it to the opposite side if you are using double sided drives.

** The INSTALL program for configuring your system and running the S.O.S. utilities is not difficult, but when all else fails, READ THE INSTRUCTIONS.

THE "DEFAULT" CONFIGURATION

The first screen asks if you want to CONFIGURE the I/O (except disk) or ACCEPT the default values. Pressing <ENTER> accepts the default values.

The DEFAULT values are:

1. Output to the printer will be 8 data bits and 1 stop bit.
2. Output to the printer will send a <CR> ONLY for each <CR> sent.
3. S.O.S. will NOT test for any special function keys such as those found on the HJL (or similar) keyboard.
4. The BEEP sound duration value will be \$004C.
5. The BEEP sound tone value will be \$0033.
6. The DISPLAY MEMORY repeat delay will be \$3500.
7. The clear keyboard rollover delay will be \$0900.
8. The PHYSICAL printer width will be set to \$50 (80 CHRS)
9. The LOGICAL printer width will be set to \$50 (80 CHRS)
10. The printer BAUD RATE will be set to \$0057 (600 baud)

The second screen you will see, if you selected the default above, will ask if you want to CONFIGURE the disk drives or ACCEPT the default values. Pressing <ENTER> accepts the DEFAULT values.

The DEFAULT values are:

1. Disk Drive step rate will be set to 30 milliseconds
2. Disk RETRY or ABORT and error messages will be displayed at the bottom of the screen when a disk error occurs or the printer is not ready.
3. The disk driver will automatically do TWO (2) retries for any disk error encountered
4. The disk driver will be configured for 35 tracks

You will then get a third screen that will ask you how many disk drives you have. You can ONLY enter 1, 2, or 3. These drives will be configured per the defaults above.

The INSTALL program will now load some more files that it needs and you will then get a screen that asks you to insert a <BLANK><FORMATTED> disk and press ANY key.

INSTALL will then write the necessary files to the disk in Drive <0> and display a message that it is done and to remove the disk and protect it and press ANY key. When you press a key, INSTALL will do a RESET (cold start) to BASIC.

This is your SYSTEM DISK and you should use BASIC to COPY the following files COPY/SOS, FORMAT/SOS, and BACKUP/SOS from the INSTALL DISK to your new SYSTEM DISK.

NEXT it would be advisable to (RUN) "SOS" and use the S.O.S. utilities to FORMAT a new disk and to make backup copies of your SYSTEM DISK. Use <COPY> "WILDCARD" (*/*) to make your backup copies. DO NOT use BASIC, as the SOSMSG/MSG file must go in the first granule and S.O.S. will put (keep) it there.

NOTE: You could use BACKUP to make those copies only if you are staying with 35 Tracks. To create a SYSTEM DISK with 40 or 80 Tracks you must use copy to get it from the 35 Track disk you just created. We also recommend backing it up on the opposite side if you are using double sided drives.

HOW TO CONFIGURE YOUR SYSTEM

If you enter "C" at the first screen to tell INSTALL that you want to configure your system, you will get the following screens:

A> This screen is for selecting the number of data bits to send to the printer for each character and the number of stop bits.

The choices are:

- <ENTER> defaults to <3>
- <1> seven data bits and one stop bit
- <2> seven data bits and two stop bits
- <3> eight data bits and one stop bit

B> This screen is for CARRIAGE RETURNS (CR) and LINE FEEDS (LF). For each <CR> sent to the printer, S.O.S. will send one of the following.

The choices are:

- <ENTER> defaults to <1>
- <1> sends <CR> ONLY
- <2> sends <LF> ONLY
- <3> sends BOTH <CR><LF>

C> This screen asks if you want to set function keys and is for special keyboards (HJL or similar). It allows you to use the FOUR keys left out by BASIC.

If you press 2 (NO TEST) and you do have an HJL keyboard the function keys will return the following values F1=\$0E,\$1C, F2=\$0F,\$1D, F3=\$10,\$1E, F4=\$11,\$1F Other keyboards will also work, but you must know the position in the keyboard table that they use. The order of keys in row 7 starting at column 1 is; enter, clear, break, F1, F2, F3, F4.

If you press 1 (SET FUNCTION KEY) then you can select one key for REPEAT and one key for CONTROL. The REPEAT key when held down will repeat any other key that is kept depressed. The CONTROL key when depressed will return a value of \$DE. A simple test for the key value being NEGATIVE will tell you the control key was depressed and if you subtract \$80 it will become \$5E which is the up arrow sign.

You may elect to utilize either of the keys and still BYPASS the other key. If you assign a repeat key, that key will not return a value to the user, but functions ONLY to repeat another key that is depressed.

The choices are;

- <ENTER> defaults to <2>
- <1> set FUNCTION KEYS
- <2> NO TEST for function keys

If you said NO TEST, then you will not see the next TWO screens but will go directly to screen "F>"

D> This screen will then ask which KEY POSITION you want to use for the REPEAT Key.

The choices are:

```
<ENTER> defaults to <5>
<1> F1 KEY    row 7, column 4
<2> F2 KEY    row 7, column 5
<3> F3 KEY    row 7, column 6
<4> F4 KEY    row 7, column 7
<5> NO TEST for REPEAT
```

E> This screen asks which KEY POSITION you want to use for the CONTROL Key.

The choices are;

```
<ENTER> defaults to <5>
<1> F1 KEY    row 7, column 4
<2> F2 KEY    row 7, column 5
<3> F3 KEY    row 7, column 6
<4> F4 KEY    row 7, column 7
<5> NO TEST for control key
```

F> This screen will allow you to change the value for the DURATION of the BEEP.

The choices are;

```
<ENTER> accepts default of $004C
or
enter a new HEX value
```

G> This screen will allow you to change the value for the TONE of the BEEP.

The choices are;

```
<ENTER> accepts default of $0033
or
enter a new HEX value
```

H> This screen allows you to select the "DELAY" value (or speed) that the cursor keys will REPEAT for the DISPLAY MEMORY routine ONLY. You can try out different values for this routine by going to the <DM> command from the S.O.S. command screen and changing the value at (\$0112).

** NOTE: This is the ONE variable that does not display its NORMAL value while in the DISPLAY MEMORY command because the routine changes the value and resets it when its done. So the value in (\$0112) is the value that DISPLAY MEMORY uses for itself.

The choices are:

<ENTER> accepts the default of \$3500
or
enter a new HEX value

J> This screen allows you to change the NORMAL (not used for DISPLAY MEMORY) value of delay used for the Clear Keyboard Rollover Table routine.

** Note: Even though you cannot examine this value while in the DISPLAY MEMORY routine, you can set the value here.

*** CAUTION: This value could turn out to be different for EACH program you run. The clearing of the keyboard rollover table is what allows keys to be REPEATED and the (delay) value determines the SPEED with which the key will repeat. The value needed then depends on the program and how many instructions or tests are made between each check for a key. Therefore, this value will normally be changed and restored by the program that is currently running in memory. What we are doing here is to allow you to set its initial value. This value WILL be used if you have selected a REPEAT key in the previous screen choice.

The choices are:

<ENTER> accepts the default value of \$0900
or
enter a new HEX value

These next TWO screens allow setting of the PHYSICAL and LOGICAL widths for the printer you have attached. S.O.S. assumes that if the PHYSICAL and LOGICAL widths are EQUAL the printer will force a CARRAIGE RETURN when a character prints in the last position even if the string of characters sent to it is longer. If the LOGICAL width is NOT EQUAL (MUST BE SHORTER IF NOT EQUAL) then S.O.S. will force a CARRAIGE RETURN when the LOGICAL width is reached. For example, if you have a printer that is capable of 132 columns but only have 80 column paper in it, then you would set the PHYSICAL width to \$84 (132 CHRS) and the LOGICAL width to \$50 (80 CHRS). Then if a string longer than 80 characters is sent to the printer, S.O.S. will force a CARRAIGE RETURN when column 80 is reached, and the string would be finished on the next line. The maximum that can be entered is \$FF (255).

K> This screen will ask for the PHYSICAL WIDTH of your printer.

The choices are;

<ENTER> accepts the default of \$50 (80 CHRS)
or
enter a new HEX value

L> This screen will ask for the LOGICAL WIDTH you want to use for your printer.

The choices are:

<ENTER> accepts the default value of \$50 (80 CHRS)
or
enter a new HEX value

M> This screen asks for the BAUD RATE you want to use for your printer.

The choices are:

<ENTER> defaults to <2> for (600 baud)

<1>	300	<4>	2400
<2>	600	<5>	4800
<3>	1200	<6>	9600

DISK DRIVE CONFIGURATION

The next screen you will get will ask if you want to CONFIGURE your disk drives or ACCEPT the default values for your drives. If you accept the default, you will then be asked how many drives, you may ONLY enter 1, 2, or 3.

If you accept the default and enter 1, 2, or 3 INSTALL will load some files it needs and will then instruct you to insert a <BLANK><FORMATTED> disk onto which it will save your configured S.O.S. Once the INSTALL program is done it will tell you to remove and protect the disk and press any key. This is your SYSTEM DISK and you should use BASIC to COPY the following files: COPY/SOS, FORMAT/SOS, AND BACKUP/SOS from the INSTALL DISK to your new SYSTEM DISK.

NEXT it would be advisable to (RUN) "SOS" and use the S.O.S. utilities to FORMAT a new disk and to make backup copies of your SYSTEM DISK. Use <COPY> "WILDCARD" (*/*) to make your backup copies. DO NOT use BASIC, as the SOSMSG/MSG file must go in the first granule and S.O.S. will put (keep) it there.

NOTE: You could use BACKUP to make those copies only if you are staying with 35 Tracks. To create a SYSTEM DISK with 40 or 80 Tracks you must use copy to get it from the 35 Track disk you just created. We also recommend backing it up on the opposite side if you are using double sided drives.

If you have decided to CONFIGURE your disk drives, then read the following material carefully before going on to screen A> below.

The system will ask you at what step rate you want to run your disk drives. Most of the newer disk drives today will handle any of the step rates available here. Some of the older RADIO SHACK drives we tested would NOT operate at the faster step rates and they would not go past track 37 !! It may be best to configure a SYSTEM DISK for the DEFAULT values and then after you bring up S.O.S. you can test the step rate and number of tracks that your drives will handle. The following is an explanation of how that can be done.

You can select a different step rate for each of the PHYSICAL drives on your system. There is a low memory variable that points to the step rate table. <STPRVC \$97A> is the address of the first byte of an 8 byte table. One byte for each LOGICAL drive. These bytes contain: (\$00, \$01, \$02, \$03 for 6, 12, 20 and 30 milliseconds respectively. Try changing these locations (one at a time for a single drive) to test the different step rates for that drive. Then try running the <FORMAT> utility so you can see how your drives perform at various step rates. Start at the SLOWEST and work up to the FASTEST. While you are doing this would be a good time to see if your 35 Track drives will go to 40 Tracks. Again, as you test them you should try going ONE track higher at a time until you reach 40 or the drive fails. The <FORMAT> utility is good for this test also. You can change the number of tracks a drive has by changing the BYTE in the table that corresponds to the drive your testing. The table is 8 bytes long, one for each drive (starting at location \$7C). *** NOTE, it is ONLY necessary to test ONE side of a double-sided drive. INSTALL will only let you set the step rate for a physical drive, so both sides will be the same

***** CAUTION *****

Use great care when making these tests.

Be sure you change the CORRECT byte with the CORRECT value. Test ONE step rate at a time and try ONE track higher at a time. Trying to make your drive go BEYOND what it is capable of could, if repeated, eventually result in damage to the drive. After you KNOW what your drives can handle then go back and configure a NEW SYSTEM DISK using the INSTALL program.

The choices and screens for disk drive configuration are as follows:

A> This screen will ask you for the step rate you want to use for your drives. You can accept the default or select one of the other options. This screen will repeat for each of 4 PHYSICAL drives or until you press <5>.

The choices are;

<ENTER> defaults to <4> 30 ms.
<1> 06 ms.
<2> 12 ms.
<3> 20 ms.
<4> 30 ms.
<5> Done (last drive)

B> This screen will ask if you want the disk error messages ENABLED. Normally you would say YES to this one. This is the basis for the disk error recovery and retry. For example, suppose you try to write or save a file to disk to discover you still had the WRITE PROTECT LABEL on the disk. You would get an error message on the bottom line of the screen (the data on that line is saved and restored after your response) and it would tell you that the disk is WRITE PROTECTED, do you want to <A>bort or <R>etry the command. Now you can remove the disk and remove the write protect tab and re-insert the disk and enter <R> and the file will be written or saved just as though no error had ever occurred. HOW ABOUT THAT ONE !! This is true of most disk drive commands unless your drive or disk has some kind of permanent error condition.

One time you wouldn't want this feature is if you are running a program with a HIGH RES SCREEN, then the system would stop and wait for your response, but you wouldn't be able to see the message and know why the system was waiting or how to get out of it. ELITE-WORD runs like this but we patched it so it turns off these messages when it runs even if they were on when ELITE-WORD started. You can FLIP this flag by changing the byte at \$0151. This byte is \$00 if messages are allowed. The default is ENABLED but you can choose to DISABLE the messages if you desire.

The choices are;

<ENTER> defaults to <1> ENABLED
<1> enable
<2> disable

C> This screen asks you how many AUTOMATIC retries for disk errors you would like set. RADIO SHACK was set for FOUR (the byte was five). We personally like TWO (the byte is three). The value that is stored is ONE higher than the number of retries.

The choices are;

<ENTER> defaults to TWO retries
or
enter a number from 1 to 8

D> The next screen you will see is for configuring the drives on your system. You will be asked to enter the NUMBER OF TRACKS and then for the SIDE and then finally for the PHYSICAL DRIVE NUMBER for this drive (is it jumpered for drive 1 <normally the first drive on the cable from the controller>. These questions will FIRST be asked for the LOGICAL Drive 0 and then repeated for each of the drives until you say this is the LAST drive.

If you read this carefully you will see that you can number your drives in almost any order. The ONLY restriction is that you must use a set of sequential drive numbers. For example, suppose you had two double sided 40 track drives. They are JUMPERED INTERNALLY (in the drive) for drive ONE and TWO. Now you could configure LOGICAL Drive 0 as 40 Track and PHYSICAL Drive 1, Side 1, then configure LOGICAL Drive 1 as 40 Track and PHYSICAL Drive 2, Side 1, then configure LOGICAL Drive 2 as 40 Track and PHYSICAL Drive 1, Side 2, then configure LOGICAL Drive 3 as 40 Track and PHYSICAL Drive 2, Side 2. NOW, if you wanted to see the directories for each drive you would have - Drive 0 would be Side 1 of PHYSICAL Drive 1, and Drive 1 would be Side 1 of PHYSICAL Drive 2, and Drive 2 would be Side 2 of PHYSICAL Drive 1, and Drive 3 would be Side 2 of PHYSICAL Drive 2.

The limitation was ONLY that you had to use LOGICAL Drive numbers 0 to 3 for the four drives on your system. Note that each SIDE is configured as a SEPARATE LOGICAL DRIVE. This is why you can have up to EIGHT DISK DRIVES on your system. And S.O.S. has all the necessary tables to update the Drive Track Table whenever one side is moved to another track, the opposite side is also updated. Your drives can also be any combination of 35, 40 or 80 Track drives.

It would also be possible to take the same TWO 40 Track double sided drives and assign them as follows:

Logical drive 0 is 40 track, side 1, physical drive 1
Logical drive 1 is 40 track, side 2, physical drive 1
Logical drive 2 is 40 track, side 1, physical drive 2
Logical drive 3 is 40 track, side 2, physical drive 2

So the physical order in which your drives are configured is up to you. You will merely be asked, one at a time, in logical sequence, starting with DRIVE 0, until the last drive is configured. For FOUR drives (sides) you would enter "8" on the fifth screen (LOGICAL DRIVE 4) to say the last drive has been configured.

*** NOTE *** If you configure more than three drives, then you will be asked if you have RADIO SHACK DISK DRIVES or DRIVE CABLE. If the answer is YES, then you CAN'T configure DOUBLE SIDED DRIVES. S.O.S. can be configured for double sided drives however you must use a drive cable which has all the pins installed. A RADIO SHACK CABLE will not work.

Also, the INSTALL program will not let you give a different number of tracks for the opposite sides of the same physical drive.

When all the drives have been configured correctly INSTALL will load some files it needs and will then instruct you to insert a <BLANK><FORMATTED> disk onto which it will save your configured S.O.S.

This is your SYSTEM DISK.

You should now use BASIC to COPY the following files COPY/SOS, FORMAT/SOS, AND BACKUP/SOS from the INSTALL DISK to your new SYSTEM DISK. You should now WRITE PROTECT this disk.

CONFIGURATION COMPLETE !!!!

NEXT it would be advisable to (RUN) "SOS" and use the S.O.S. utilities to FORMAT a new disk and to make backup copies of your SYSTEM DISK Use <COPY> "WILDCARD" (*/*) TO to make your backup copies. DO NOT use BASIC, as the SOSMSG/MSG file must go in the first granule and S.O.S. will put (keep) it there.

NOTE: You could use BACKUP to make those copies only if you are staying with 35 Tracks. To create a SYSTEM DISK with 40 or 80 Tracks you must use copy to get it from the 35 Track disk you just created. We also recommend backing it up on the opposite side if you are using double sided drives.

You should put the FIRST SYSTEM DISK (the one created by INSTALL) away and make the newest copy your WORKING SYSTEM DISK.

THAT'S IT. You should now have a SYSTEM DISK that is configured for YOUR SPECIFIC devices. Below are some notes that you should read through when you get a chance. They may help you understand S.O.S. just a little better.

** NOTE ** When you first started and had the blank formatted disk ready for the INSTALL program, it was ONLY a 35 Track disk as it was formatted by BASIC. So if you configure your system for 40 track drives, you CAN NOT do a backup from the FIRST (or newly created) disk. So you would have to RUN S.O.S. and FORMAT another disk (this time at 40 Tracks) and then do a WILDCARD COPY to the second disk.

You will have to REMEMBER to use some caution when trying to duplicate some of your disks, if they were created by BASIC. S.O.S. can copy ANY file no matter who created the file, but it can NOT backup from a 35 Track disk to a 40 Track disk. So to move files from a 35 Track disk to a 40 Track disk you will have to use <COPY>. FILES are readable and compatible between BASIC and S.O.S. This is even true if you have a file on a granule that is higher than 67 and you use BASIC to KILL/RENAME a file on the same disk, as S.O.S. does not lose the file allocation for granules that are higher than BASIC can handle.

***** CONFLICTS *****

There is one possible conflict between BASIC and S.O.S. That is if BASIC should try to do ANYTHING (kill, load) a file that is in or goes into granule(s) that are higher than BASIC allows. In this case the results are unpredictable. BASIC may get lost.

If you have any problems with ANY PORTION of S.O.S. or the utilities and you have done your best and have read the instructions, then by all means call or write and let us know. We are here to help in any way we can. We want S.O.S. to be a benefit to you. If its not then all of the time and effort we put into it would be of little or no value. So let us help if we can. We have tried to keep the instructions as simple as possible considering the task. And for those of you who are really into machine language, this will seem like too little information and you should look into THE PROGRAMMERS REFERENCE GUIDE. It will provide a complete description of all commands and memory variables and vectors. There are examples that go along with the explanations and the use of registers is fully explained for each routine. We hope you will really become attached, as we have, to using some of the routines that we have provided. GOOD LUCK and let us know of any improvements or suggestions you might have.

SECTION V DISK UTILITIES

BACKUP

AN S.O.S. UTILITY PROGRAM

BACKUP is RUN as a program and is NOT an S.O.S. command. It is very straight forward and self explanatory when run. The Backup Command Screen will first ask you for the SOURCE DRIVE number and then for the DESTINATION DRIVE number. These can be different drives or the same drive. Pressing the <BREAK> key while in this screen will return you to S.O.S. You will then be given a second chance to be sure that you have entered the correct drive numbers and also to INSERT the correct diskettes. If you respond with any key except <ENTER> the backup will be aborted and you will be returned to the request for drive numbers again.

NOTE: Backup will ONLY allow you to backup drives with EXACTLY the same number of tracks (35 and 35, 40 and 40, etc). It WILL backup from side to side. When the backup is done you will be asked if you want another. If your response is anything except <Y> then you will be returned to S.O.S.

If you are doing a backup to the same drive then you will be asked to INSERT the SOURCE or DESTINATION diskettes at the appropriate times and this will be for every TEN TRACKS. Be CAREFUL not to get your hands crossed and insert the wrong diskette. Watch the messages.

If you have some disks that are ONLY formatted for 35 tracks and you would like to get these files to a disk that is formatted for 40 tracks then is best to format the disk and to use the COPY program and do a "full wildcard" copy.

COPY
AN S.O.S. UTILITY PROGRAM

COPY is RUN as a program and is NOT an S.O.S. command. It does however have a number of significant improvements over the copy capabilities of "RADIO SHACK BASIC". First it can copy any type file across any configuration of drives (side to side, 40 to 80,etc.) and secondly it has some very flexible "wildcard" capabilities.

You can also copy two 40 track disks to one 80 track disk and you can also copy the contents of an 80 track disk to two 40 track disks. If you have a disk that has several files that have been fragmented across the disk, then copying these files to another disk will put them back into sequential granules if the new disk is not fragmented itself.

The COPY command screen has three lines into which you can enter data. The first is the drive numbers. Here any valid drive numbers can be used. The first number is the SOURCE DRIVE and the second number (separated by a ":") is the DESTINATION DRIVE. You will ONLY be allowed to enter 3 characters on this line and you can backspace and change any character until you press <ENTER>. While you are on line number one you will see a message that says <break for SOS> and that is exactly what will occur if you press <BREAK>. If you are on line two or three then that message will not show but one that says <BREAK TO RESTART> and this will erase any data input thus far and will RESTART the screen and put you back on line one. Again, at this time you could return to S.O.S. You can copy files to and from different drives or the same drive. When the same drive is used as the SOURCE and the DESTINATION drive, then you will be given the message(s) to insert the SOURCE OR DESTINATION diskette at the appropriate times. This is true for single file or wild card copying.

First we will talk about straight file copying and then later we will talk about wild card copying.

The next entry is for line number two. This is looking for the file FILENAME/EXT of the source file. When you press <ENTER> you will go to line number three. If the DESTINATION file is to have the SAME file filename/extension then all you need to do is press <ENTER>. You only need to enter the name/extension here if it is going to be different than the SOURCE. But if you do, then the NAME and EXTENSION will have to be entered.

NOTE: Wild card characters are not allowed and will not be accepted on the third line. If wild card characters are used on the second line then you will NOT be given the option to enter data on the third line at all. The system must assume at this point that if you use any wild card characters on the second line that the destination files will have the same names as the source.

For WILD CARD copying, there are TWO types of wild card characters. The "*" and the "+" signs. The "+" or plus sign is a SINGLE CHARACTER ONLY wild card. It is used in place of any single character. For example, "TEST/B++" would be for any file whose name is "TEST" AND whose extension begins with the letter "B". Or, "+EST/+IN" would be for ANY file with the second thru fourth letters of "EST" and ANY first character, and whose extensions second and third letters were "IN" and ANY first character. The "+" sign can be used anywhere in the filename or extension and can be used any number of times. The only limitation is (8) characters for the name and (3) characters for the extension.

The "*" is more powerful and a little more difficult to explain. It has several different functions. First it can be used as a "TOTAL" type wild card. For example, "*/*" will copy ALL files from the SOURCE to the DESTINATION. Or "*/BIN" would copy ALL files with an extension of "BIN" from the source to the destination drives. The "*" wild card can also be used as a "PARTIAL" type wild card but not limited to one character. ONLY one "*" can be used in a field, and the position will determine how many characters it replaces. We saw that by itself it replaced ALL characters in the field. When it is used WITH other characters in a field it will replace EITHER all characters to the LEFT or the RIGHT. For example, "TES*/*" would copy ANY files whose first three characters is "TES" and any extension. Or "*ING/*" will copy ANY files whose (8) character name ends in "ING" with ANY extension.

ERRORS AND MESSAGES

Whenever an unusual condition occurs, you will receive an appropriate message to explain what has happened. For example, FILE NOT FOUND, NO MATCH PER WILDCARD REQUEST, DISK ERROR, DISK FULL(DESTINATION), DESTINATION FILE ALREADY EXISTS etc. Your response to these messages will depend on whether you are doing a single file copy or wildcard copying.

In single copy mode most errors will give you two possible choices. You may <A>bort, which will return you to the main copy menu; or you may <R>etry which will retry the command and if successful, will then return you to the main copy menu. If not successful, you will get another error message. Some errors, like "SOURCE FILE NOT FOUND" will just automatically return you to the main copy menu. For errors in wild card mode, the responses are a little different depending on what you are trying to do. For example, if you were doing a wild card copy and some of the files ALREADY existed on the destination disk, then each time one of these is encountered you will be asked if you want to <A>bort (entirely), or <S>kip (this file ONLY and continue with the rest of the files), or <R>eplace (kill the destination file and replace with the source file). A <R>eplace will also continue with the rest of the files after the replace is done.

Now for "DUMPING" an 80 track disk to TWO 40 track disks. When the 40 track disk does not have enough room for the next file you will get a message stating same. At this time if you respond with <R>etry then the directory and file allocation will be written for the first disk and then you will be asked to INSERT the destination diskette. At this time you can put in the SECOND 40 track disk and press enter and the copying will continue, starting with the file that would not fit on the first disk. One CAUTION here.

If the file that would not fit on the first disk was a very large file, then it is possible that THREE disks will be required to hold the files from the 80 track disk. If an error occurs for which no options exist, then you will see the message and will be asked to press <ENTER>. You will also notice that on the Main Copy Screen, it says " <?> for help". This does not give any explanations for entering data or how to respond to messages but is intended only as a "REMINDER" of how data is entered on the three lines of the main menu for single and wildcard copying of files. It is brief and serves as a quick reference for entering data and can only be seen if you are on the FIRST line of the copy menu.

FORMAT
AN S.O.S. UTILITY

Format is RUN as a program and is NOT an S.O.S command. It is a very straight forward utility and the on-screen requests are self explanatory. You will first be asked WHICH DRIVE, and any valid drive number may be entered. If you press the <BREAK> key while in this first screen, then you will be returned to S.O.S. The screen will then change and affirm the drive to be used and the number of tracks that this drive is configured for, and ask you to INSERT the disk to be formatted. If all is correct and you are ready then press <ENTER>. Pressing the <BREAK> key at this time will return you to the first screen.

At the end of the format you will be asked if you want another and any response except <Y> will return you to S.O.S.

SECTION VI ERROR HANDLING

Every effort has been made to make error handling both easy for the operator and meaningful. Two general types of errors are generated, one prints a message on the bottom line of the screen and restores whatever was there after the error has been handled and the other type returns you to the main command screen and displays an error number. DON'T REACH FOR THE BOOK OR PANIC YET !! If you haven't memorized these numbers yet, we have provided a command < PE > which will print the error message on the Main command screen for you. See the PRINT ERROR command in SECTION III for more detail if you need it.

The first type of error which displays a message on the bottom line of the screen is intended primarily for Printer Not Ready or Drive Not Ready type errors. Either you forgot to turn something on or maybe you forgot to put the disk in or remove the Write Protect label etc. We have made this a more forgiving error. If your printer is not ready you will see PRINTER NOT READY and it will wait for you to make it ready. If you get an error from the disk drive you will be asked if you want to RETRY or ABORT this will allow you to turn on your disk drive or put a disk in the drive and continue on just as you were without losing anything or retyping the command by simply typing < R >. If for some reason you have changed your mind or can't continue you may abort the operation by typing < A >. We are sure you will find this feature useful more than once as you continue to use S.O.S.

These are the possible Drive Errors that may appear at the bottom of your screen:

DRV NOT RDY
WRT PROTECT
WRITE FAULT
SEEK ERR, NRF
CRC ERROR
LOST DATA

The other type of error returns you to the Main Command Screen and displays an error number generally because it is not possible to continue without some corrective action on your part. A complete list of the error numbers and description is provided on the following page for your reference.

LIST OF ERROR NUMBERS GENERATED BY S.O.S.

ERROR NO.	DESCRIPTION
<hr/>	
10	DISK IS FULL
11	ERROR READING DIRECTORY
12	ERROR READING FAT
13	ERROR READING SECTOR
14	ERROR WRITING DIRECTORY
15	ERROR WRITING FAT
16	ERROR WRITING SECTOR
17	FILE ALREADY OPEN
18	FILE NOT FOUND
19	FILE NOT OPEN
20	INVALID WITH FILE(S) OPEN
21	INVALID FILE NUMBER
22	INVALID FILE TYPE
23	INVALID FILE NAME
24	INVALID RECORD NUMBER
25	INVALID RECORD SIZE
26	NO FILES AVAILABLE
27	NO DATA IN THIS FILE
28	NOT A BINARY FILE
29	NOT A RANDOM FILE
30	NOT AN INPUT FILE
31	NOT AN OUTPUT FILE
32	PAST END OF FILE
33	RANDOM FILE ERROR
34	MESSAGE FILE NOT ON DISK
35	TRACK NUMBER TOO HIGH
36	DISK DRIVE ERROR
37	NOT FOUND/DIRECTORY FULL
38	INVALID DRIVE NUMBER
39	NOT AN ASCII FILE

SECTION VII SYSTEM VARIABLES AND VECTORS

The following is a list of some of S.O.S.'s system variables and vectors along with a brief description of each. These are listed here as an aid for those of you who might have a need to interrogate or use them. For a complete listing of all the variables and jump vectors with full explanations and examples for using them are currently working on a PROGRAMMERS REFERENCE GUIDE.

\$00 to \$09 are not used by S.O.S.
\$1F start of User RAM (initialized to \$0CD4) FILES 3
* \$39 sounds a BEEP tone
* \$4B sends char. in "A" to output per "DEVMNUM"
* \$57 clear the screen
* \$60 get a char. in "A" from INPUT per "DEVMNUM"
\$63 machine language load began at
\$65 machine language load ended at
\$6F device number (-2=ptr, 0=scr, 1-15=disk)
\$70 input/output flag, end of file or full (last char.)
\$74 end of User RAM (initialized to \$E000) FILES 3
\$7C disk drive maximum track table (8 drives)
\$84 pointer to Disk I/O routine, no error checks
\$86 pointer to disk variables (\$00EA)
\$88 current cursor position
\$8A ALWAYS zero (\$0000) two bytes
\$93 actual (physical) printer width (default \$50)
\$95 printer baud rate value (default \$0057) 600 baud
\$9D machine language (binary) program execute address
\$9F Parallel print flag
* \$BE Disk I/O routines, with error checks and recovery
* \$CA blink cursor and wait for a KEY
\$D6 pointer to date string (string is 8 chars long)
\$D9 maximum drive number on system (3 = four drives)
\$DA file allocation address table (ADR+2) for 8 drives
\$EA DRIVE COMMAND (2=READ, 3=write, etc.)
\$EB DRIVE NUMBER
\$EC TRACK NUMBER
\$ED SECTOR NUMBER
\$EE BUFFER ADDRESS POINTER
\$F0 STATUS BYTE (\$00= no errors)
\$F4 disk drive maximum granule table (8 drives)
\$FE contains S.O.S. current error number
* \$100 software interrupt type III vector
* \$103 software interrupt type II vector
* \$106 software interrupt type I vector
* \$109 (nmi) non maskable interrupt
* \$10C (irq) normal interrupt vector (16.5 ms.)
* \$10F (frq) fast interrupt vector (63 us.)
\$112 delay value for repeat key timeout
\$11A upper/lower case flag

* \$13C get a line from the keyboard to the buffer (max=\$FF)
* \$145 test for key depressed, no wait, no cursor blink
\$151 if \$00 then enables disk error messages
* \$18E all errors trap to here (does JMP \$011D)
\$2DC \$02DD = Line buffer and \$2DC = Character count
* \$3E0 send character in "A" to printer
\$400 screen ram (\$400 to \$5FF)
* \$626 send char. in "A" to screen at current cursor position
\$928 address table FCB's (2 x 16), max files = 15
\$94C <disk file> NAME (8 characters)
\$954 <disk file> EXTENSION (3 characters)
\$95A DEFAULT drive number
\$95B number of disk files actually OPEN
\$95F current number of FCB's allocated (initialized to 3)
* \$969 send string at "X" to screen till a "0"
\$973 sector # of last found directory entry
\$974 address in buffer of last found directory entry
\$976 first granule # of last found directory entry
\$977 sector # of first available directory entry
\$978 address in buffer of 1ST available dir. entry
\$97A address of disk speed rate table (8 bytes)

* NOTE. All vectors or "entry points" start with "JMP" and are three bytes long. Therefore no indirect "JMP's" or "JSR's" are required.

* * * * ATTENTION PROGRAMMERS * * * *

(available soon)

If you are really into machine language programming and need more information, then the PROGRAMMERS REFERENCE GUIDE may be just what you need. It will contain a complete description of all the variables and describe their use and the effect of changing them. This GUIDE will also contain all of the jump vectors for routines and how they are used and which registers are used and which are protected. Many helpful notes and explanations along with examples will be provided.

For registered owners and software developers the SOURCE CODE for S.O.S. may be purchased.

SECTION VIII QUICK REFERENCE

COMMAND	DESCRIPTION	PAGE
< CL >	CLOSE	9
< DC >	DATE CHANGE	9
< DD >	DEFAULT DRIVE	10
< DI >	DIRECTORY	10
< DL >	DATA LOAD	10
< DM >	DISPLAY MEMORY	11
< DS >	DATA SAVE	12
< EX >	EXECUTE	12
< FG >	FREE GRANULES	13
< FI >	FILES	13
< KI >	KILL	13
< LO >	LOAD	13
< OP >	OPEN	14
< PE >	PRINT ERROR	14
< PP >	PARALLEL PRINT	15
< RB >	RETURN to BASIC	16
< RE >	RENAME	16
< RU >	RUN	16
< SA >	SAVE	17
< ZM >	ZERO MEMORY	18

FIXTW64

Used for patching TELEWRITER-64

FIXTW64/SOS is a file that will patch the "TW64/BIN" file to run under S.O.S. Currently there two different versions of TELEWRITER-64 on the market. The oldest version only ran on RADIO SHACK DISK BASIC 1.0 and the newer version ran on either 1.0 or 1.1. FIXTW64 will work with either version. It is not even necessary for you to know which version you have as this is handled automatically.

All you need to do is run (RU) "FIXTW64/SOS". You will first be instructed to insert the TELEWRITER-64 disk that contains the file "TW64/BIN" and then you will be instructed to insert the diskette with the patch files "TWOVLY0/BIN" and "TWOVLY1/BIN". Next you will be asked to insert the diskette that you want to save the patched TELEWRITER-64 file to. This will now be named "STW64/BIN" so you will know it is a patched version used to run under S.O.S.

Next, you should copy the "STW64/BIN" file to the diskette that you will be running TELEWRITER from and also copy the file "SU/SOS" to the same diskette. SU is the front end loader or driver program that replaces the "U/BAS" file. That's all you need to do. None of the other files from the TELEWRITER-64 disk are needed as everything else has been incorporated into the patched file. You will now be able to print files, chain print files, save/read/append ASCII or BINARY files with just these two files.

Now when you want to run TELEWRITER-64 all that you need to do is run (RU) "SU" and TELEWRITER-64 will come up and go directly to the main menu. NOTE, that the "SU" file expects the file "STW64/BIN" to be on drive "0". This can be changed; see the notes below which explain how to change the startup parameters for TELEWRITER-64.

When you are in the EDITOR portion or the FORMAT menu of TELEWRITER-64 everything should work just as it did before.

NEWFILE, EDIT, WORDS, FORMAT, SPACE, LINES, CHARS/LIN all work just as they did before.

There are a few differences when running TELEWRITER 64 under S.O.S.

First and probably most significant is the fact that you are always in the DISK menu whenever the menu is on the screen. You no longer need to remember to press "D" to go to the disk menu. This is true whether you are just entering TELEWRITER-64 or if you are coming from the EDITOR.

Second is the fact that you now have just over 38000 bytes of memory space for text.

READ, APPEND, and SAVE work just a little different than they did before. The file name that is displayed on the menu with its extension and drive number is the file that will be loaded or saved if the default is accepted. For example if you were going to READ a file. You would press the "R" key, and you would be asked "SURE ?" After entering a CAPITOL "Y" you will see a screen that asks for a filename, extension, drive number, etc. Pressing enter without entering any data accepts the defaults that showed on the main menu. You only need to enter those that are being changed. If the filename is one of the changes then it must come first, otherwise the order doesn't matter. This screen is the same one you see when you are loading or running a file from the main command screen of S.O.S. If you become unsure of your entree or change your mind then all you have to do is press the BREAK key and you will be returned to the main menu.

"p%SAVE": still works the same as before except that now you press the character "p" instead of the "%" sign.

"FILE": is the default file that will be loaded or saved as mentioned in read/save above.

"dRIVE": command lets you change the default drive that will be used for saves and loads. Just press the "D" and the cursor will blink alongside of the current drive number and wait for you to enter a valid drive number. Remember that on return to S.O.S. the default drive will be restored to the value in the setup parameters table below. The default is normally set to drive "0".

"q<SOS>" command is the QUIT command and returns you to S.O.S. Note that it does allow you to again return to TELEWRITER-64 and continue without losing any text. That is, you won't lose any text if you don't load or run another program. You can however do a <DI> directory, <KI> kill, <RE> rename, or <DM> display memory without any affect on text currently in memory. This is in fact how you do these commands as you will notice that "PRINT DIR", "NAME", and "KILL" commands are no longer on the menu screen of TELEWRITER.

To return to TELEWRITER-64 from the command screen of S.O.S. you will need to do an <EX> execute command. You will then see the execute screen which will display the HEX address that will be executed. If you have not altered anything this should be \$0AA4. Just press enter and in a moment you will be back in the TELEWRITER-64 menu. Pressing BREAK will get you out of the execute command and back to the main command screen of S.O.S.

"mASC NO" or "mASC YES": is a new command on the TELEWRITER menu. Pressing the "M" key will flip this back and forth from yes to no and no to yes. *** BECAREFUL WITH THIS ONE ***. This is now how you tell TELEWRITER whether you want the read or save to be in ASCII or BINARY. If the screen says "mASC NO" then it will be BINARY. If it says "mASC YES" then it will be ASCII. You will also notice that as this flips back and forth by pressing the "M" key, that the extention for the current file also flips back and forth from "BIN" to "DAT" and "DAT" to "BIN".

"FORMAT": the format screen works exactly as it did before with one exception. You can not set the "queue". If you try it will just set itself back to "0". This was used for chaining cassette and cassette is not supported here.

One other difference is for files that were created by doing a partial or block save. These files had to be read in and saved seperately to be used in chaining files. This is no longer true. Any file may now be chained regardless of whether it was a full or partial save. NOTE, it is still true that you can NOT mix BINARY and ASCII when chaining.

All other commands should work just as they did before. This includes all the embedded control commands in the EDITOR.

The differences in operating TELEWRITER-64 are small and should only take a moment to get used to and they should prove to be quite beneficial. First of all you will see that you now have approximately 38000 bytes of text space to work with. You can now use all forty tracks on a 40 track drive. You can even use an 80 track drive. The drives will run faster and always remember where they are. You no longer need to remember the "D" command and you don't have to wait for it to load into memory. With an expanded keyboard (like the HJL) you can even have a repeat key. Also if you have purchased the TELEPATCH program from SPECTRUM PROJECTS, some of the features from it can be incorporated into the TELEWRITER file and run under S.O.S.

See the patch file called "FIXPAT/SOS" for details.

NOTE, if you choose, you may alter the setup parameters in the "SU/SOS" file so that TELEWRITER-64 starts up with the default values the way you like them. In addition to changing all the parameters you can also change the drive that the "SU" file will load the "STW64/BIN" file from. This is labeled "default load" in the table below. Also, the default drive for text files that TELEWRITER will use on startup can be changed and is labeled "default in" in the table below. Also the default drive can be restored on exit of TELEWRITER to S.O.S. and this is labeled "default out" in the table below. You could even setup more than one "SU" file. Remember to give them different names ("SU1" "SU2" etc.) That way you could have different startup files that are set to specific values for the different formats that you might use.

First, <LO> load the "SU/SOS" file into memory. Then do a <DM> display memory command. Now you can change the parameters according to the table below. NOTE, all values are in HEX.

PARAMETER	LOCATION	DEFAULT VALUE
DEFAULT IN	(\$0AB7)	\$00
DEFAULT OUT	(\$0AD4)	\$00
DEFAULT LOAD	(\$1040)	\$00
CHARS PER LINE	(\$115D)	\$32 dec. 50
LINES PER PAGE	(\$1161)	\$42 dec. 66
LINE SPACING	(\$1165)	\$01
ONE PAGE	(\$1169)	\$00
EPS/OKI/LF	(\$116E)	\$00
JUSTIFY	(\$1172)	\$00
NUMBER PAGES 1ST BYTE	(\$1177)	\$00
NUMBER PAGES 2ND BYTE	(\$117B)	\$00
WHERE	(\$117F)	\$26 dec. 38
LEFT MARGIN	(\$1184)	\$05
UPPER MARGIN	(\$1188)	\$03
BOTTOM MARGIN	(\$118C)	\$03
QUEUE	MUST REMAIN ZERO	
XMIT	USES S.O.S. VALUE	

THE VALUES BELOW THIS LINE WILL NOT HAVE ANY EFFECT UNLESS YOU OWN TELEPATCH FROM SPECTRUM PROJECTS AND YOU HAVE RUN THE PATCH FILE "FIXPAT/SOS". IF YOU HAVE THEN YOU MAY ALSO CHANGE THE FOLLOWING;

COLOR SET (\$F0 OR \$F8)	(\$1195)	\$F0	F8
SHIFT REPEAT DELAY	(\$11A3)	\$04	
KLICK OFF (\$00 OR \$FF)	(\$11B1)	\$00	
KLICK TONE 1ST BYTE	(\$11B6)	\$00	00
KLICK TONE 2ND BYTE	(\$11BB)	\$10	14
KLICK DURATION 1ST BYTE	(\$11C0)	\$00	
KLICK DURATION 2ND BYTE	(\$11C5)	\$10	
REPEAT RATE	(\$11CA)	\$25	
REPEAT DELAY	(\$11CF)	\$04	01
INSERT MODE	(\$11D4)	\$00	
CASE TOGGLE	(\$11D9)	\$01	

10A 20
0B

BECAREFUL when making these changes. Make sure the values and locations are correct. You will then have to save the file back to disk. It might be advisable to save the file to a different diskette, so you don't risk losing the original. The <SA> save will have to be a multiple block save.

Return to the main command screen of S.O.S. from the display screen by pressing BREAK.

Next, do a <SA> save command. At the save screen you will be asked to enter the addresses for the save. Enter them exactly as "0AA4/0BCE/+000/" (no quotes) and press enter. Now you will be asked for the file name. Enter "SU/SOS:D" where "D" equals the drive number. S.O.S. will then save the first block and will again ask for more addresses for the next block. Enter them exactly as "1000/11F4/104C/" (no quotes) and press enter. S.O.S. will now save this block and close the file as it knows this is the last block.

That's it! TELEWRITER-64 should now come up with all the parameters setup just the way you want them.

Good luck and let us know if you have any problems or questions and we'll do our best to help you.

FIXPAT

Used for patching TELEWRITER-64 with TELEPATCH

FIXPAT/SOS is a file that will patch the "STW64/BIN" (actually the "TW64/BIN" file already patched by "FIXTW64") to incorporate some of the features of TELEPATCH from SPECTRUM PROJECTS into TELEWRITER-64 running under S.O.S.

First, you will have to own TELEPATCH from SPECTRUM PROJECTS. Before running this patch file you must first run the patch file "FIXTW64/SOS" which will patch the "TW64/BIN" file and rename it to "STW64/BIN".

Next you should run the patch file "FIXPAT/SOS". You will first be asked to insert the diskette that contains the file named "TWPATCH/VRL" from SPECTRUM PROJECTS. Next you will be asked to insert the diskette that contains the file "STW64/BIN". Then you will be asked to insert the diskette from SPECTRUM PROJECTS again with the file "KBD/VRL". Last you will be asked to insert the diskette that you want to save the new patched file to.

The new file will now be named "STW64P/BIN". This is done to keep it separate from the other files. NOTE, the file "TW64/BIN" is a straight TELEWRITER-64 file. The file "STW64/BIN" is TELEWRITER-64 patched to run under S.O.S. but without TELEPATCH. And the file "STW64P/BIN" is TELEWRITER-64 patched to run under S.O.S. and also has TELEPATCH features added to it.

Next you should copy the file "STW64P/BIN" to the diskette that you want to run TELEWRITER from. Also copy the file named "SU/SOS" to the same diskette. Note, the "SU" file works with either the old or new version of TELEWRITER-64 and also with or without TELEPATCH. So no changes to this file are necessary. There is one caution. If you <RU> run "SU" and both files "STW64/BIN" and "STW64P/BIN" are on the same disk, then "STW64/BIN" (without TELEPATCH) will be run. SU first looks for the file "STW64/BIN" and if its not on the diskette it then looks for "STW64P/BIN".

Now lets explain what you get from all of this. We said that SOME of the features of TELEPATCH are incorporated. Thats because some of them are not needed. RAMDISK is not needed as the disk menu for TELEWRITER-64 is always in memory when patched to run under S.O.S. Even so, you still get over 38000 bytes of text space. S.O.S. also always remembers where the disk drive is so it is not necessary to rezero and seek for the track it wants.

S.O.S. already allows for the faster seek speeds to be used on your disk drives and also allows for use of all forty tracks and even 80 tracks and can also handle double sided drives. There is already a reset routine in S.O.S. and it has been merged to work with TELEWRITER. When you are somewhere in S.O.S. the reset will return you to the main command screen of S.O.S. When you are somewhere in TELEWRITER the reset will return you to inside the EDITOR of TELEWRITER. The screen may be blank, but all you have to do is a CLEAR UPARROW. Disk errors are handled without bombing out your data and you can get the error number by returning to S.O.S. and then back to TELEWRITER. If its a temporary error you will be given a chance to retry the save or load and if it goes without a hitch, you will continue as though no error had occurred at all. You can already do ASCII or BINARY saves and loads without having to run a different file. So the above features are already in TELEWRITER when patched to work with S.O.S.

All of the other features of TELEPATCH are incorporated when you run the "FIXPAT/SOS" patch file. They are; true block move, visible carriage returns, key beep, key repeat, justify still on after printing, lower case toggle, over strike mode, fast cursor movement,

NOTE, the file "TSPOOL/BAS" does NOT work with this setup. S.O.S. can not run BASIC programs. Though its no more difficult to do a normal binary save and print the file later.

With TELEPATCH you were given a new file called "T/BAS" and you could patch this so the startup parameters could be set to your liking. This can still be done, but requires patching the file "SU/SOS". See the write up for "FIXTW64" for the values and locations to change. The normal TELEWRITER setup values and the TELEPATCH values have both been incorporated into this one file. You can change the key klick to on or off and the rate at which the keys will repeat and the delay before repeating starts. Insert mode, case toggle, color set, and so forth can also be set.

Thats about it. If you have any problems or questions or suggestions then let us know. We'd like to help if we can.

SOISTMANN ENTERPRISES, INC.
P.O. BOX 257
BUDD LAKE, N.J. 07828
(201) 691 - 0043

MARCH 6, 1987

JOHNSTOWN, PA. 15904

DEAR R ;

Well, I think this is it. We have the patch file running with TELEWRITER-64 and your version of TELEPATCH. We haven't tested every possible feature of TELEWRITER-64, but so far as we have tested, all seems to be ok.

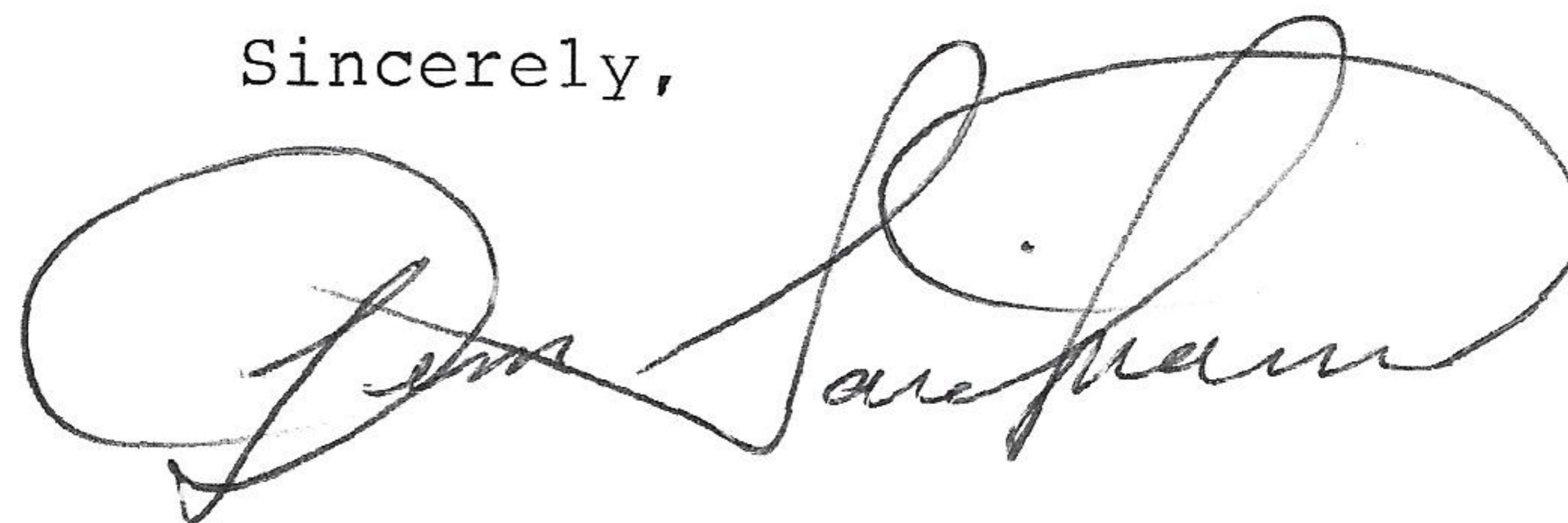
There are no changes in the instructions except for the names of two of the files used. The file "FIXPAT/SOS" is now called "FP21/SOS" for your version of TELEPATCH and the file "SU/SOS" is now called "SU21/SOS" for your version of TELEPATCH. The instructions should tell you how to use these files.

I'm returning your diskettes and the blank one now has the two new files you needed plus it also has a copy of TELEWRITER-64 that is patched for S.O.S. and it is also patched for your version of TELEPATCH. You could just "COPY" those two files ("STW64P21/BIN" AND "SU21/SOS") to a new diskette and start using them.

We would be interested in hearing from you after you have had a chance to use this new setup and let us know how you made out, even if only a post card.

Please feel free to call on us again if you have any questions or problems. Thanks again for your patience and co-operation.

Sincerely,

A handwritten signature in black ink, appearing to read "James A. Soistmann". The signature is fluid and cursive, with "James" on the left and "A. Soistmann" on the right, all contained within a single large, sweeping line.

JAMES A. SOISTMANN

SOS ORDER AND RECEIPT FORM

NAME:	<i>R.</i>		
ADDRESS			
CITY	<i>Johnstown</i>		
STATE	<i>PA</i>	ZIP CODE	<i>15904</i>
PHONE NUMBER		ORDER DATE	<i>1-16-87</i>
SHPG&HNDLG	<i>3.00</i>	NJ TAX	<i>N/A</i>
TOTAL PAYMENT	<i>52.95</i>	PAYMENT CODE	<i>CHEQUE</i>
ORDER INFORMATION			
S.O.S. SERIAL NUMBER	<i>10021</i>	SHIP DATE	<i>1-21-87</i>
ITEM ORDERED (DESCRIPTION)		QTY ORDERED	QTY SHIPPED
1 PROGRAMMERS REFERENCE GUIDE			
2 SOS DISK UTILITIES			
3 THE MICRO WORKS E/A/D/B			
4 COMPUTER WARES E/A			
5 COGNITECS TELEWRITER-64		<i>1</i>	<i>1</i>
6 ELITE SOFTWARES ELITE*WORD			
7 DUGGERS GROWING "C" 1.2 & 2.5			
8 DOUBLE DENSITYS CLRTERM+ 3.3/4.1			
9 RADIO SHACKS EDTASM D. & C.			
10 RADIO SHACKS SCRIPTSIT D. & C.			
11			
12			
13			
14			
SHIPMENT CARRIER	PO	<input checked="" type="checkbox"/>	UPS
			OTHER

CASSETTE TO DISK TRANSFER

The program "TTODX/SOS" will transfer files from cassette to disk. It will convert (M.L.) BINARY files, BASIC files, and DATA files.

Before you run the "TTODX" file, you must first run the file called "MAKTP/SOS". This file will create a file called "TAPE/BIN" which is used by the "TTODX" program. TTODX expects the file "TAPE/BIN" to be on drive 0 when it is run. The file "TAPE/BIN" only needs to be created once. From then on you just need to be sure it is on the disk in drive 0 when you run the program "TTODX".

When you run the program "TTODX/SOS" it will ask you for a tape filename to search for or to press enter. If you enter a name, the program will go through the tape files looking for your request. NOTE, you should use an 8 character name for your request. Include ending spaces if necessary. For example if you had two files (1. "testone" and "tesstwo" and you only entered "test" for the search, then the first file that has the first four characters as "TEST" would be transferred.

If you just pressed <ENTER> at the request, then the program will stop at each file and display its name for you and ask if this is the file you want transferred. If you say no it will return to the request screen and just press enter again and it will search for the next one and again ask if this is the file you want. At the request screen you can press <BREAK> to return to S.O.S.

After the tape file has been read in you will see a screen that asks for the file name to use to save the file to disk. You only need to enter the filename at this point. The default extension given to the file will be (BAS, DAT, BIN) depending on the type of file read off of tape. You can however change the extension at this screen if you want. The file will normally be saved to drive 0 and this can also be changed at the filename screen.

Thats all there is to it. TTODX can save a file that is over 50,000 bytes in size which should take care of most any tape file you can create. If you have any questions or problems, let us know. We're here to help if we can.

DISK NUMBER = (# 0021) SIDE # (0)

<S.O.S. > SOISTMANN ENTER.. INC

DATE = (01/19/87) GRAN'S FREE = 051

001 INSTALL /BAS	001 MRR /BIN
001 SOSLDR /BAS	001 ERROR /MSG
001 ROMPAT /BIN	004 PRESOS /BIN
003 SETVARS /BIN	001 BACKUP /SOS
002 COPY /SOS	004 FORMAT /SOS
001 MAKTP /SOS	001 TTODX /SOS
001 SU /SOS	002 FIXTW64 /SOS
001 FIXPAT /SOS	001 TWOVLY0 /BIN
001 TWOVLY1 /BIN	

DISK NUMBER = (# R.B.) SIDE # (0)

TELEWRITER-64 & TELEPATCH (PATCH FILES)

DATE = (03/06/87) GRAN'S FREE = 069

001 FP21 /SOS	005 STW64P21/BIN
001 SU21 /SOS	001 DEMO /BIN
001 /BIN	

REDACTED DUE TO PNI TO LIVING RELITIVE
