

SVI • 777

STRINGY FLOPPY DRIVE USER'S MANUAL

Scanned by abuur, converted to PDF by HansO, 2009

Every effort has been made to supply complete and accurate information in this manual. Nevertheless, due to our never ending commitment to improve both product design and performance, we reserve the right to change product specifications at anytime without prior notice.

No part of this publication may be stored in a retrieval system, transmitted, or reproduced in any way, including but not limited to photocopy, photograph, magnetic or other record, without the prior agreement and written permission from Spectravideo International Ltd.

Registered trademark used in this manual are:

Spectravideo SVI, SVI-767, SVI-777 and SOS are trademarks of Spectravideo International Ltd.

MSX, MSX DISK BASIC and MSX BASIC are trademarks of Microsoft Corporation.

Microwafer is a trademark of Entrepo, Incorporated.

Stringy Floppy is a trademark of BSR.

Every effort has been made to supply complete and accurate information in this manual. Nevertheless, due to our never ending commitment to improve both product design and performance, we reserve the right to change product specifications at anytime without prior notice.

No part of this publication may be stored in a retrieval system, transmitted, or reproduced in any way, including but not limited to photocopy, photograph, magnetic or other record, without the prior agreement and written permission from Spectravideo International Ltd.

Registered trademark used in this manual are:

Spectravideo SVI, SVI-767, SVI-777 and SOS are trademarks of Spectravideo International Ltd.

MSX, MSX DISK BASIC and MSX BASIC are trademarks of Microsoft Corporation.

Microwafer is a trademark of Entrepo, Incorporated.

Stringy Floppy is a trademark of BSR.

SPECTRAVIDEO
INSTRUCTION MANUAL STATEMENT

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been designed to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

WARNING

This equipment has been certified to comply with the limits for a class B computing device, pursuant to Subpart J of Part 15 of FCC Rules.

TABLE OF CONTENTS

CHAPTER	PAGE
1 INTRODUCTION.....	1-1
1.1 PACKAGE AND INSTALLATION.....	1-1
1.2 THE MICROWAFER TAPE.....	1-4
1.3 THE STRINGY FLOPPY OPERATING SYSTEM (SOS).....	1-7
1.4 CONVENTIONS USED IN THIS MANUAL.....	1-8
2 BASIC OPERATION	
2.1 TO LOAD THE STRINGY FLOPPY OPERATION SYSTEM.....	2-1
2.2 TO SHOW THE DIRECTORY.....	2-3
2.3 TO NAME A FILE.....	2-5
2.4 TO FORMAT AND GENERATE THE SYSTEM ON MICROWAFER TAPE.....	2-6
2.5 TO COPY FILES.....	2-9
3 SOS OPERATING COMMANDS.....	3-1
3.1 STATEMENT ENTRY COMMANDS.....	3-2
3.2 DEVICE ENTRY COMMANDS.....	3-10
3.3 AN EXAMPLE.....	3-23
4 SOS GRAPHIC COMMANDS.....	4-1
5 WAFER EDITOR.....	5-1
6 SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM.....	6-1
6.1 PHYSICAL CHARACTERISTICS.....	6-1
6.2 FILE FORMAT.....	6-1
6.3 TAPE FORMAT.....	6-1
6.3.1 User Storage Tape	
6.3.2 Master Tape	
6.4 STRINGY FLOPPY OPERATING SYSTEM.....	6-7
6.4.1 General Features	
6.4.2 System Routine Entry Point	

APPENDICES

APPENDIX A	
SPECIFICATIONS.....	A-1
APPENDIX B	
I/O MAP.....	B-1
APPENDIX C	
COMMAND SUMMARY.....	C-1

ILLUSTRATIONS

Fig. 1.1	
Remove the Cover and Insert Batteries.....	1-2
Fig. 1.2	
Plug in the Cables.....	1-3
Fig. 1.3	
Microwafer Tape.....	1-5
Fig. 1.4	
Write-protection Nob.....	1-6
Fig. 2.1	
Insert a Microwafer Tape.....	2-1
Fig. B.1	
Joystick Plug Pin Connection.....	B-1
Fig. B.2	
Cassette Plug Pin Connection.....	B-2
Fig. B.3	
External Cassette Socket Pin Connection.....	B-3

1 INTRODUCTION

Welcome to the world of SVI-777 Stringy Floppy Drive. This first chapter will describe how to install the Stringy Floppy Drive and then introduce some general concepts of the Stringy Floppy Operating System (SOS) and the conventions used throughout this manual.

1.1 PACKAGE AND INSTALLATION

Check with the table below to see whether any part is missing or damaged. If so, please contact your authorized SVI dealer.

SVI-777 Stringy Floppy Drive	1
SVI-777 User's Manual	1
SVI Customer Reply Card	1
Master Tape	1

Now, all the necessary components are before you. Follow the procedure below to connect the SVI-777 Stringy Floppy Drive to your SVI MSX computer or any other MSX computer you have.

STEPS

1. Position the power switch, at the rear of the SVI-777, to the OFF position.
2. Slide out the cover of the battery compartment, at the bottom, in the direction in which the arrow is pointed.
3. Insert 2 size D batteries into the compartment and make sure that the positive ends "+" and negative ends "-" of the batteries are correctly placed.

INTRODUCTION

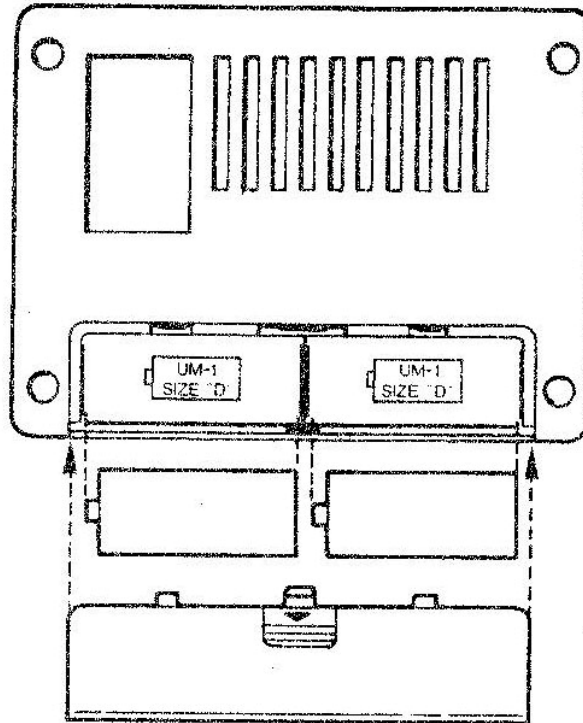


Fig. 1.1 Remove the Cover and Insert Batteries

4. Replace the cover.
5. Make sure that the SVI-777 Stringy Floppy Drive and your computer are turned OFF.
6. Plug the cables of the SVI-777, one for the cassette port and the other for the JOYSTICK PORT 2, into the appropriate sockets on your computer.

If you have an SVI-767 data cassette, plug its cable into the cassette port on the Stringy Floppy Drive as well.

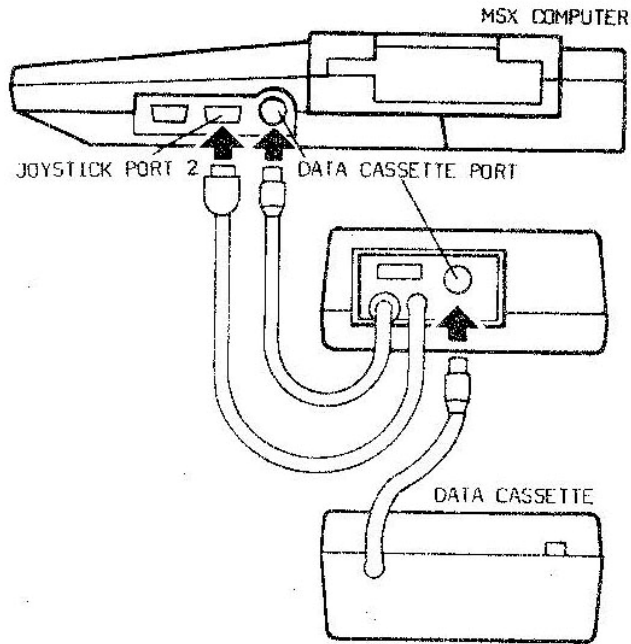


Fig. 1.2 Plug in the Cables

7. Turn on the monitor then the Stringy Floppy Drive and your computer. Notice that the power lamp on the front panel of the Stringy Floppy Drive is ON.
8. From this moment on, your SVI-777 Stringy Floppy Drive is ready for use.

INTRODUCTION

NOTE

- A. If the power lamp doesn't light, turn off the power of all the devices and check whether the cables are inserted improperly. Consult your local dealer if the problem remains.
- B. If the power lamp goes out while the Stringy Floppy Drive is working (in-use lamp is on), check whether the batteries are placed improperly or the power of the batteries has run out. Consult your local dealer if the problem remains.
- C. While the Stringy Floppy Drive is working (in-use lamp is on), the flash of power lamp indicates that batteries can only last for another hour at most and therefore need replacement.

If the lamp goes out, the batteries must be replaced immediately.

- D. It is normal for the screen of some monitors or T.V. sets to blink while the motor of the Stringy Floppy Drive is on.

1.2 THE MICROWAFER TAPE

The microwafeter tape is similar to a mini-size cassette tape except it has a shutter that prevents accidental damage to the tape inside.

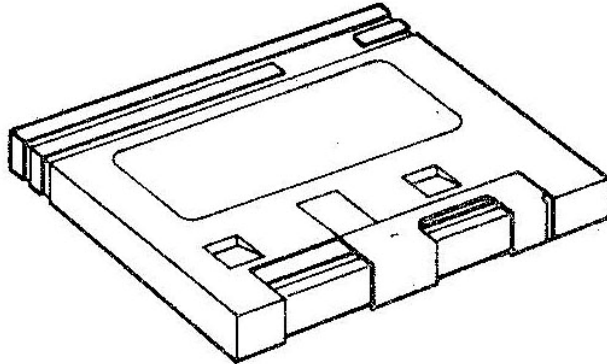


Fig. 1.3 Microfafer Tape

Despite its small size, the microfafer tape provides a storage capacity ranging from 14K bytes to 100K bytes depending on the length of the tape. Besides, it is much faster and more reliable than a data cassette tape.

The microfafer tape, though less vulnerable than a cassette tape or floppy disk, should be handled with care. Here are some suggestions:

1. Don't open the shutter because this may cause accidental damage to the tape.
2. Keep it away from magnetic fields (motor, telephone, T.V. set, etc.) or ferromagnetic material that might become magnetized, because any strong magnetic field can distort recorded data.
3. Never put them in direct sunlight or where the temperature exceeds 50°C. The safe storage temperature is between 4°C and 50°C.
4. Peel off or push down the write-protection nobs of those tapes containing valuable information.

INTRODUCTION

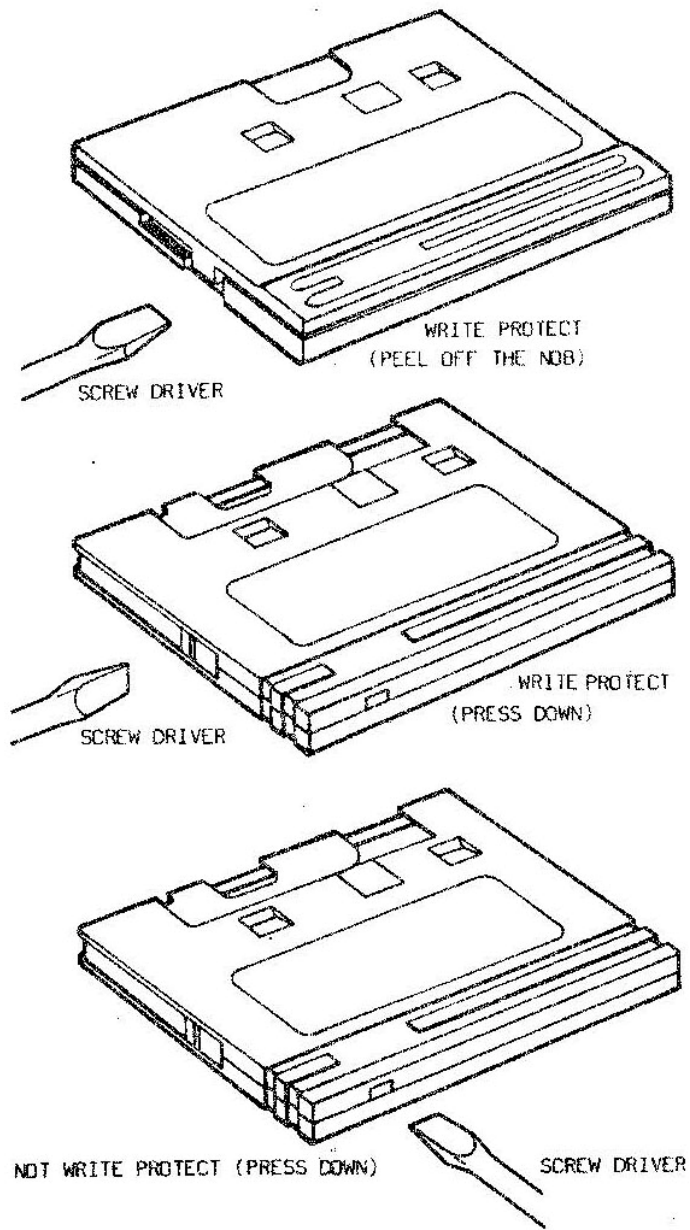


Fig. 1.4 Write-protection Nob

5. Always remove the tape before you turn off the power. This can prevent accidental loss of data.

1.3 THE STRINGY FLOPPY OPERATING SYSTEM (SOS)

An Operating System (OS) is a group of programs that interacts with the application programs and manages the computer resources. It oversees all input/output (I/O) activities between the computer and its peripheral devices.

The Stringy Floppy Operating System (SOS) is a kind of operating system which runs compatibly with all MSX computer (with 64K RAM) using the MSX BASIC language and enables you to create and keep track of files, run and link programs, and communicate with the Stringy Floppy Drive, and the printer that are attached to your computer.

In order to access the Stringy Floppy Operating System, at least the following files must be included on the tape:

FILE NAME	FUNCTION
LOADER0.SYS	A loading routine, in cassette format that MSX BASIC can understand, helps to boot up loader 1.
LOADER1.SYS	A loading routine, in stringy format that the Stringy Floppy Drive can understand, helps to boot up SOS or the first autorun file (a binary file that runs automatically when it has been loaded at an address between 4000H - F300H) on the tape.

If there is no SOS file or any other autorun file, it will return to MSX BASIC.

INTRODUCTION

SOS.SYS This is the Stringy Floppy Operating System
and a kind of autorun file, too.

1.4 CONVENTIONS USED IN THIS MANUAL

The following conventions describing the statement and command syntax will be used throughout this manual:

[] The parameters enclosed in square brackets are optional.

< > The parameters enclosed in angle brackets must be entered. Usually, you must type in an entry defined by the lower case text. For instance, <filename> means that you have to type in the file name.

... An ellipsis "... " indicates that a parameter may be repeated as many times as desired and should not be considered as punctuation.

ENTER Press the **ENTER** key once.

A This convention means the control key and usually comes with other character(s) to represent a certain command, such as **AC**.

When you see this, press the control key and the corresponding key simultaneously.

2 BASIC OPERATION

In this chapter we will discuss the basic operation and some commands used when running the Stringy Floppy Operating System.

2.1 TO LOAD THE STRINGY FLOPPY OPERATING SYSTEM

Follow the steps below to load SOS into the memory of your computer:

STEPS

1. Turn on the monitor and then the Stringy Floppy Drive and your MSX computer.
2. After the 'OK' prompt appears, insert the master tape containing SOS into the slot of the Stringy Floppy Drive until properly seated.

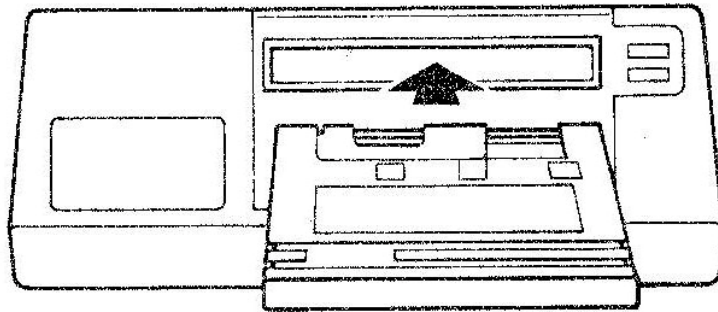


Fig. 2.1 Insert a Microwafer Tape

3. If you have a data cassette connected to the String Floppy Drive, make sure that it is not pressed; otherwise, errors will occur. Then

TYPE: blood "ces:[BIOI]",r

BASIC OPERATION

NOTE

All SOS commands can be used in lower case or upper case letter as in MSX BASIC language. And the spaces between commands and filenames is optional. Therefore, the above command line can be written in any of the following:

```
blod "cas:[BOOT]",r
```

```
blod "CAS:[BOOT]",r
```

```
BLOAD "CAS:[BOOT]",R
```

```
BLOAD "cas:[BOOT]",r
```

4. A few seconds later, the message "FOUND: BOOT" appears. This means the LOADER0.SYS is being loaded into the computer and going to boot LOADER1.SYS.

When LOADER1.SYS is booted up, the screen will change as follows:

```
SVI-777 Stringy Floppy System  
Boot loader! release 1.00  
  
booting system sector
```

Fig. 2.2 Screen of LOADER1.SYS

5. After awhile, the message "SOS.SYS" appears and this means the Stringy Floppy Operating System is being loaded.
6. An "OK" prompt will appear to indicate that SOS is loaded.

2.2 TO SHOW THE DIRECTORY

A file is an organized collection of related information, such as programs, text, and data, usually held in a storage media like the microwafer tape, floppy disk, or data cassette tape. Each file, when it was created, was assigned a unique name that you can call to.

A directory not only organizes the files on the same media but also keeps record of their size and type.

If you want to see the directory of the tape you are working with, the current directory, the command CALL SDIR tells SOS to display all the files onto the screen. Let's try it and see how many files are on the master tape:

TYPE: CALL SDIR

NOTE

In the above command, the letter S means "Stringy" and CALL can be replaced by an underline "_". Therefore, the command can be written as: _SDIR.

Remember that the letter S is a must for all the Stringy Floppy Commands.

Since an underline "_" can substitute for the word CALL in a command line, it will be used, whenever necessary, throughout this manual for convenience.

BASIC OPERATION

TYPE	FILENAME	REC	ATTR
B	LOADER0.SYS	15	
B	LOADER1.SYS	02	
B	SOS.SYS	06	
B	WAFFER0.SYS	02	R/O
B	FILECOPY.SYS	03	R/O
B	SFORMAT.SYS	06	R/O
T	GRAPHIC.SYS	05	R/O
B	GRAPHIC.SUB	03	R/O

record(s) remain = 05

Fig. 2.3 Directory of Stringy Floppy Master Tape

The information of the master tape shown in the directory is as follows:

"TYPE": There are three types of files:

T signifies the corresponding file is saved in Tokenized BASIC format.

A signifies the corresponding file is saved in ASCII format.

B signifies the corresponding file is saved in Binary format.

"FILENAME": Lists out the names of the files stored on the master tape.

"REC": Shows the number of Kbytes used to record the corresponding file.

"ATTR": Shows the attribute of each file:

R/O signifies the corresponding file can be read only.

W/O signifies the corresponding file can be written only.

R/W signifies the corresponding file can be read or written.

NO ATTRIBUTE WILL FOLLOW THOSE FILES THAT CANNOT BE READ OR WRITTEN.

"record(s) remain =": Shows the storage capacity (in K bytes) left on the microwafer tape.

2.3 TO NAME A FILE

From the above directory of the master tape, you will notice that each file name consists of two parts, for example:

LOADERO.SYS

The first part is the file name (LOADERO) which can be from 1 to 8 characters long and the second part is its extension (.SYS) that can be 3 or fewer.

A file name and its extension is made up of letters (UPPER AND LOWER CASE LETTERS ARE CONSIDERED AS DIFFERENT CHARACTERS) and numbers. NO OTHER CHARACTERS ARE ALLOWED.

However, two special characters "?" and "*", called WILD CARDS, though they still cannot be used to name a file or its extension, give greater flexibility when using the COPY utility program. This will be explained more clearly in the later section of this chapter.

2.4 TO FORMAT AND GENERATE THE SYSTEM ON MICROWAFER TAPE

Unlike the data cassette tape, any blank or reused microwafer tape, before it can retain any information, must be formatted so that it will be organized in the way that the computer can understand.

WARNING

Since formatting a used microwafer tape will erase all previously stored information, make sure that the used microwafer tape does not contain any valuable data and is not write-protected beforehand.

When the Stringy Floppy Formatter Program--SFORMAT--on the master tape is being executed, it will not only do the formatting but it can copy the loading routines and Stringy Floppy Operating System onto the microwafer tape as well.

This Stringy Floppy Formatter Program provides 3 options:

1. Format the microwafer tape.
2. Format the microwafer tape and Copy the loading procedures (LOADER0.SYS & LOADER1.SYS) so that any autorun file can be written on it and then be executed after the computer is booted up.
3. Format the microwafer tape and Copy the loading procedures and the Stringy Floppy Operating System.

Now, follow the procedure below to format and/or generate the system on a microwafer tape:

STEPS

1. Load SOS from the master tape.
2. Type: `_SRUN ("SFORMAT.SYS")`
3. After awhile, the screen will appear as follows:

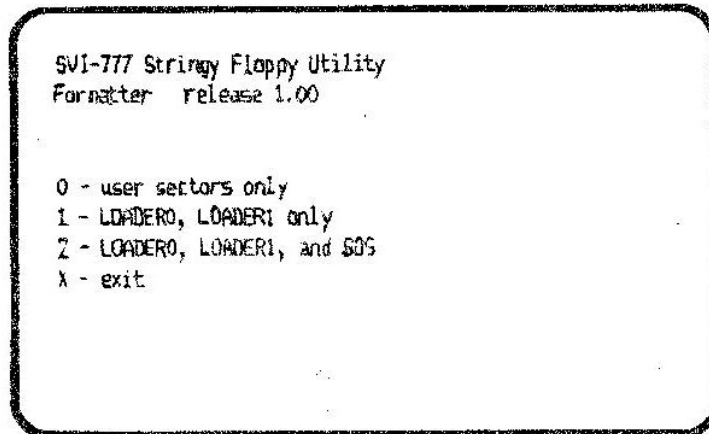


Fig. 2.4 Stringy Floppy Formatter Screen

4. Choose one of the options from the Formatter Menu or [X] to return to the BASIC command level.
5. The computer will reply with the following message:

Insert the tape to be formatted, confirm (Y/N)

Pressing Y will start to format and pressing N will return the program to the Formatter Menu.
6. Before formatting begins, the program will search and check the length of the tape and display it on the screen.

BASIC OPERATION

7. Then, the program will start to format the tape and show the following message:

```
format xx
```

where xx is the sector being formatted.

NOTE

If either option 1 or 2 is selected, a message:

```
format xx - yy
```

will be displayed near the end of the tape, which means LOADER0.SYS has occupied those sectors from xx to yy.

8. The program will start to verify the tape after formatting is finished.
9. The process will end in about 1 to 3 minutes depending on the chosen option and length of the tape. Then, the total sectors formatted (number of sectors on tape) and the number of sectors available for use (the storage capacity that can be used) will be displayed. And the program will return to the Formatter Menu.

NOTE

If any error occurs during formatting, the program will try again automatically and display the message retry on the screen.

If the error occurs again, format fail will be displayed to show that the tape you are working with is probably faulty. And the program will return to the Formatter Menu.

2.5 TO COPY FILES

The FILECOPY.SYS program on the master tape allows you to copy file(s) from a microwafer or from a data cassette tape onto another microwafer tape.

STEPS

1. Load SOS from the master tapes
2. Type: `_SRUN ("FILECOPY.SYS")`
3. Seconds later, the screen will appear as follows:

```
SVI-777 Stringy Floppy utility
file copier  release 1.00

1 - Stringy Floppy
2 - Cassette

select source format ( 1 or 2 ) ?
or ctrl-c to exit
)
```

Fig. 2.5 Filecopy Menu Screen

4. Press 1 if the source file is on a microwafer tape.
Press 2 if the source file is on a data cassette tape.

BASIC OPERATION

5. Type in the name of the file to be copied.

NOTE

As mentioned previously, two wild cards, ? and *, add flexibility to the copy program.

The question mark ? wild card in a filename or filename extension indicates that any character can occupy that position. For example, LOADER?.SYS would refer to both the LOADER0.SYS and LOADER1.SYS on the master tape because ? represents any character.

An asterisk * wild card in a filename or its extension indicates that any character can occupy that position or any of the remaining positions. For example, *.SYS means all the files on the tape with the extension .SYS.

Hence, for instance, suppose you want to copy the current tape to another microwafer tape, you would simply enter *.* to represent all the files on the microwafer tape.

When copying from data cassette, however, only the first encountered program will be copied. If the file on data cassette has no filename, or is pressed instead of giving its name, the file will be stored under the filename temp.tem on the microwafer tape.

6. Insert the tape containing the source file. Then press .
7. After the message Read OK is displayed, insert the destination microwafer tape, then press .

- B. When finished copying, repeat from step 5 to copy another file or press AC to return to BASIC command level.

NOTE

After you press AC, the message mount (y/n)? will appear.

Press y if you want to work on the current tape.

Press n if you want to replace the current tape with the original one containing the FILECOPY.SYS program.

3 SOS OPERATING COMMANDS

In this chapter we will describe all the commands for the Stringy floppy Operating System. Basically the commands supported by SOS can be divided into two types:

1. Statement Entry: Commands of this type are usually preceded by the word CALL or an underline "_" symbol.
2. Device Entry : Commands of this type enable the Stringy floppy Drive to act as a standard input/output (I/O) device.

Some of the commands, either statement entry or device entry, can be entered by pressing corresponding function keys instead, as shown at the bottom of the screen. They are:

F 1	-	_SDIR	F 6	-	_SSAVE
F 2	-	_SLOAD	F 7	-	_SREN ("
F 3	-	_SRUN ("	F 8	-	_SSET ("
F 4	-	LIST	F 9	-	_SREMOVE
F 5	-	RUN	F 10	-	_SMOUNT

Before we start discussing these two types of commands, familiarize yourself with the following notation which indicates how you should format the commands.

1. Items in square brackets "[]" are optional. Don't include the square brackets if you wish to include the optional information.
2. Any items enclosed in angle brackets "< >" and defined by the lower case text must be entered. For example, you should enter the name of the file when <filename> is shown in the format.
3. All punctuation, if shown, must be entered (except the square and angle brackets).

An ellipsis "..." indicates that an entry may be repeated as many times as desired and should not be considered as punctuation.

STATEMENT ENTRY COMMANDS

__SDIR Lists names of files on a specified microwafer tape

__SKILL Deletes a specified file

__SLOAD Loads a specified file into the computer's RAM

__SMOUNT Loads the directory from the current microwafer tape

-SREMOVE Updates the directory of the current microwafer tape

__SREN Changes the name of a specified file

__SRUN Executes a specified file

__SSAVE Saves a program onto the microwafer tape

__SSET Sets the Read/Write status of a program and specifies whether it is an autorun file

__SDIR

FORMAT : **__SDIR**

PURPOSE: Lists out all the files in the directory on the current microwafer tape.

COMMENT: This command only lists out the directory of the last inserted tape. If a new tape is inserted, the **__SMOUNT** command must be issued to instruct the computer to update the directory.

SKILL

FORMAT : `_SKILL ("<filename>")`

PURPOSE: Deletes a specified file on the current microwafer tape.

COMMENT: If the specified file to be deleted is set to be read only, an error message, write inhibited, will appear.

EXAMPLE: Deletes a file named ABC:

`_SKILL ("ABC")`

Deletes a file named ABC with an extension DEF:

`_SKILL ("ABC.DEF")`

SLOAD

FORMAT : `_SLOAD ("<filename>" ["<file type>"])`

PURPOSE: Loads a specified file on the current microwafer tape into the computer's RAM.

COMMENT: File type can be "T" (Tokenized), "A" (ASCII), or "[H]<address>" (Binary) where "H", when typed in, means the offset address is in Hexadecimal (above 8000H); otherwise, the offset address is in Decimal (above 32768).

IF NO FILE TYPE IS SPECIFIED, SDS WILL LOAD THE FILE ACCORDING TO THE TYPE INDICATED IN THE DIRECTORY.

If the file name and file type you entered is different from the entry in the directory, an error message, type mismatch, will appear.

OPERATING COMMANDS

E1 Loads a Tokenized BASIC file ABC:

_SLOAD ("ABC" "T")

Loads an ASCII format BASIC file DEF:

_SLOAD ("DEF" "A")

Loads a Binary file GHI with a hexadecimal value 9000 offset to all addresses (i.e. loading start and end addresses, and execution address):

_SLOAD ("GHI" "H 9000")

Loads a Binary file JKL with a decimal value 42000 offset to all addresses:

_SLOAD ("JKL" "42000")

__SMOUNT

FORMAT :

PURPOSE: When a new microwafer tape is inserted, this command loads its directory.

COMMENT: After this command is issued, a message will appear for confirmation. Type Y to confirm.

--SREMOVE

FORMAT :

PURPOSE: Updates the directory of the current microwafer tape.

COMMENT: When a file has undergone certain changes, such as being renamed, deleted, or saved, THIS FUNCTION MUST BE CALLED BEFORE REMOVING THE TAPE; OTHERWISE, NO CHANGES WILL BE RECORDED AND A FATAL ERROR WILL RESULT.

SREN

FORMAT : SREN ("**<new filename>**" "**<old filename>**")

PURPOSE: Changes the name of a specified file.

EXAMPLE: Changes the file name ABC to DEF:

SREN ("DEF" "ABC")

SRUN

FORMAT : SRUN ("**<filename>**" [**<file type>**"])

PURPOSE: Loads and executes a specified file on the current microwafer tape.

COMMENT: File type can be "T" (Tokenized), "A" (ASCII), or "[H]<address>" (Binary) where "H", when typed in, means the offset address is in Hexadecimal (above 8000H); otherwise, the offset address is in Decimal (above 32768).

IF NO FILE TYPE IS SPECIFIED, SOS WILL LOAD AND EXECUTE THE FILE ACCORDING TO THE TYPE INDICATED IN THE DIRECTORY.

If the file name and file type you entered is different from the entry in the directory, an error message, type mismatch, will appear.

SOS OPERATING COMMANDS

EXAMPLE: Loads and executes a Tokenized file ABC:

```
_SRUN ("ABC" "T") 
```

Loads and executes an ASCII file DEF:

```
_SRUN ("DEF" "A") 
```

Loads and executes a Binary file GHI with a hexadecimal value 9000 to all addresses:

```
_SRUN ("GHI" "H 9000") 
```

Loads and executes a Binary file JKL with a decimal value 42000 to all addresses:

```
_SRUN ("JKL" "42000") 
```

SSAVE

FORMAT : Tokenized BASIC File:

```
_SSAVE ("filename" ["T"]) 
```

ASCII File:

```
_SSAVE ("filename" "A") 
```

Binary File:

```
_SSAVE ("filename"  
"[H]<loading start address>"  
"[H]<loading end address>"  
["[H]<execution address>"]) 
```

PURPOSE: Saves a program in memory to a microwafer tape as a Tokenized BASIC file, ASCII file, or Binary file.

COMMENT: If <execution address> is omitted in a Binary file, the <loading start address> is regarded as the <execution address>.

EXAMPLE: Saves a file ABC in Tokenized BASIC:

```
_SSAVE ("ABC") 
```

```
_SSAVE ("ABC""T") 
```

Saves a file DEF in ASCII format:

```
_SSAVE ("DEF""A") 
```

Saves a file GHI in Binary format with the <loading start address> 1000 and <loading end address> 2000 in hexadecimal:

```
_SSAVE ("GHI" "H 1000" "H 2000") 
```

Saves a file JKL in Binary format with the <loading start address> 1000, <loading end address> 2000, and <execution address> 1050 in decimal:

```
_SSAVE ("JKL" "1000" "2000" "1050") 
```

__SSET

FORMAT : `__SSET ("filename" "four character string")`

PURPOSE: Sets file attribute (Read/Write status) of a program and specifies whether it is an autorun file.

SOS OPERATING COMMANDS

COMMENT: The values of the <four character string> are as follows:

POSITION	VALUE	FUNCTION
1	0	NOT READ PROTECTED (Not effective on those originally read protected files)
	1	READ PROTECTED
2	0	NOT WRITE PROTECTED
	1	WRITE PROTECTED
3	0	NOT AUTORUN BY LOADER1
	1	AUTORUN BY LOADER1
4	0	NOT AUTORUN BY SOS
	1	AUTORUN BY SOS

The first two values set the Read/Write status of a file, and the possible combinations are as follows:

POSITION	1	2	STATUS
	0	0	R/W
	0	1	R/O
	1	0	W/O
	1	1	Cannot read or write

SOS OPERATING COMMANDS

If a file is originally read protected, the value 0 in position 1 is not effective. This occurs in most of the game programs for protective purposes.

The third value only sets Binary file (offset address between 4000H to F300H) to be autorun from LOADER1.SYS.

The fourth value can set all types of file (if in Binary format, the offset address must be above 8000H) to be run automatically from SOS.SYS.

The following table shows the possible combinations of the third and fourth value:

PRIORITY	POSITION		
	3	4	
1	1	1	If there is no SOS.SYS, autorun by LOADER1.SYS; otherwise, autorun by SOS.SYS.
2	1	0	In order to be autorun by LOADER1.SYS, THERE MUST BE NO SOS.SYS; otherwise, it cannot be autorun.
3	0	1	Autorun by SOS.SYS.
4	0	0	Not autorun by LOADER1.SYS or SOS.SYS.

SOS OPERATING COMMANDS

EXAMPLE: Sets the attribute of a file ABC to R/W and autoruns it after SOS.SYS:

```
_SSET ("ABC""0001") ENTER
```

Sets the attribute of the above file ABC to R/O and autoruns it after LOADER1.SYS:

```
_SSET ("ABC""0110")
```

WARNING

Remember that the file autorun by LOADER1.SYS must be a Binary file and the offset address between 4000H - F300H.

3.2 DEVICE ENTRY COMMANDS

OPEN	Reads or writes file through the Stringy Floppy Drive
CLOSE	Closes the file that has been opened
PRINT#	Writes data to the specified channel
PRINT# USING	Writes data to the specified channel in a specified format
INPUT#	Reads data items from the specified channel and assigns them to program variables
LINE INPUT#	Reads an entire line from a sequential file to a string variable
INPUT\$	Reads a string of characters from a sequential file to a string variable

SOS OPERATING COMMANDS

SAVE Saves a BASIC program file to a specified device in ASCII format

LOAD Loads an ASCII format BASIC program file from the Stringy Floppy Drive

MERGE Merges an ASCII format BASIC program file to the current BASIC program in computer's memory

RUN Loads and executes an ASCII format BASIC program file from the Stringy Floppy Drive

FOR ALL DEVICE ENTRY COMMANDS, ERROR MESSAGE "Type Mismatch" WILL OCCUR IF THE FILE IS NOT IN ASCII FORMAT.

OPEN

FORMAT : OPEN "S:<filename>" FOR <mode> AS [#]
<file number>

PURPOSE: Reads or writes files through the Stringy Floppy Drive.

COMMENT: This command allocates a buffer for input/output and set the mode of I/O operation for the buffer.

In the command line, <filename> is an ASCII file in the drive that you want to access and "S:" is the device name for the Stringy floppy Drive.

<mode> is one of the following:

OUTPUT: Specifies sequential output mode.

INPUT : Specifies sequential input mode.

SOS OPERATING COMMANDS

<file number> is an integer whose value is between 1 and the maximum number of the files. It is associated with the file as long as it is opened. It must not be the one that is already being used in the program.

THIS DEVICE COMMAND MUST BE EXECUTED BEFORE THE FOLLOWING COMMANDS TAKEN PLACE:

PRINT# PRINT# USING INPUT# LINE INPUT#
INPUT\$

EXAMPLE: Opens a file to the Stringy Floppy Drive and writes information on it:

OPEN "S:INFO" FOR OUTPUT AS #1

CLOSE

FORMAT : CLOSE [[#]<file number>
 [,[#]<file number>...]]

PURPOSE: Closes the specified file(s) that you have OPENed.

COMMENT: If no <file number> is specified, all open channels will be closed.

The file may be reopened using the same or a different file number; likewise, that file number may then be reused to open any other file.

SOS OPERATING COMMANDS

EXAMPLE: Closes file no. 1:

CLOSE # 1

Closes files no. 1, 2, 3:

CLOSE # 1, # 2, # 3

Closes all files: "

CLOSE

PRINT#

FORMAT : PRINT# <file number>, <list of expressions>

PURPOSE: Writes data to the specified channel.

COMMENT: The <file number> is the number used when the file was opened for output.

The <list of expressions> are the numeric and/or string expressions that will be written to the file. They should be delimited by semicolons.

An explicit delimiter, such as a comma ",", may be used to format the string expressions correctly on the file.

If the strings themselves contain commas, semicolons, significant leading blanks, carriage returns, or line feeds, these delimiters should be surrounded by explicit quotation marks.

SOS OPERATING COMMANDS

EXAMPLE: Let A\$ = "TELEPHONE" and B\$ = "3-624809"

```
PRINT# 1, A$: B$ 
```

This would write TELEPHONE3-624809 to the microwafer tape because there are no delimiters. This inputs them as one (in fact are two separate strings) string.

```
PRINT# 1, A$; ", "; B$  or
```

When an explicit delimiter was inserted, TELEPHONE,3-624809 would be written and can be read back as 2 string variables.

If the quotation marks are considered as parts of the string, CHR\$(34) can be used to print out the quotation marks:

```
PRINT# 1, CHR$(34); A$; CHR$(34); CHR$(34); B$; CHR$(34)
```

This would write "TELEPHONE""3-624809" to the microwafer tape.

PRINT# USING ---

FORMAT : PRINT# <file number>,
USING <string expression>;
<list of expressions>

PURPOSE: Writes data to the specified channel in a specified format.

COMMENT: The <file number> is the number used when the file was opened for output.

The <list of expressions> are the numeric and/or string expressions that will be written to the file. They should be delimited by semicolons.

SOS OPERATING COMMANDS

An explicit delimiter, such as a comma ",", may be used to format the string expressions correctly on the file.

If the strings themselves contain commas, semicolons, significant leading blanks, carriage returns, or line feeds, these delimiters should be surrounded by explicit quotation marks. Refer to the PRINT# command.

The <string expression> contains the special format that determines how the items are to be printed. Notice that a <string expression> must be enclosed in quotation marks.

The examples below will demonstrate how the formatting characters can be used to format the string field:

EXAMPLE: 1 Specifies that only the first character in the given string is to be printed:

```
10 A$ = "Stringy"  
20 PRINT# 1, USING "!"; A$
```

In this case, only the letter S will be written to the file.

2 Specifies that the whole character in the given string is to be printed:

```
10 A$ = "Stringy"  
20 PRINT# 1, USING "% Floppy"; A$
```

This will write Stringy Floppy to the file.

SOS OPERATING COMMANDS

Specifies that a digit in the given string is to be printed and a decimal point may be inserted at any position between these special characters:

If the number has fewer digits than specified by the formatting characters, it will be right-justified with preceding spaces:

```
PRINT# 1, USING "##.###"; 3.1416
```

This will write 3.1416 to the file. Notice that 2 spaces precede the digits 3.1416.

If the formatting characters specify more decimal places than the number to be printed, the empty spaces will be filled with zero:

```
PRINT# 1, USING "#.#####"; 3.1416
```

This will write 3.141600 to the file.

If the number does not fit in the formatting characters, it will be rounded:

```
PRINT# 1, USING "##.###"; 12.3456
```

Once rounded, the number, 12.346, will be written on the file.

If the number to be printed is negative, then a negative sign will be included but it will occupy one digit space in the specifier:

```
PRINT# 1, USING "##.###"; -1.234
```

SOS OPERATING COMMANDS

The number -1.2340 will be written on the file.

If the number to be printed does not fit into the field specified by the format characters, a % sign is printed in front of the number. This also happens when the rounded number exceeds the size of the field:

```
PRINT# 1, USING "#.###"; 9.9999
```

%10.000 will be written on the file.

You may print two or more numbers with the same format in one PRINT# USING statement:

```
PRINT# 1, USING "##.##"; 10, 13.336
```

Here, 10.00 and 13.34 will be written on the file.

- + A plus sign at the beginning or the end of the formatting string will cause the sign of the number (plus or minus) to be printed before or after the number:

```
PRINT# 1, USING "+##.###"; -0.234, 2.333
```

-0.234 and +2.333 will be written on the file.

```
PRINT# 1, USING "##.###+"; -0.234, 2.333
```

The same results will be written to the file except with the trailing signs: 0.234-, 2.333+.

SOS OPERATING COMMANDS

** A double asterisk sign at the beginning of the formatting string causes leading spaces in the numeric field to be filled with asterisks:

```
PRINT# 1, USING "***.##"; 1.25, -1.25
```

The result **1.25, *-1.25 will be written to the file.

\$\$ A double dollar sign at the beginning of the formatting string specifies two more digit spaces in the field, one of which will be the dollar sign:

```
PRINT# 1, USING "$$.###"; 1.234, -2.33
```

\$1.234 and -\$2.330 will be written to the file.

, A comma placed to the left of the decimal point in the formatting string causes a comma to be printed every third digit to the left of the decimal point:

```
PRINT# 1, USING "#####.##"; 123456.78
```

123,456.78 will be written to the file.

The comma, when placed at the end of the formatting string, is considered as part of the string:

```
PRINT# 1, USING "###.##,"; 123.45
```

123.45, will be written to the file.

Notice that if the comma is used with the exponential format, it has no effect.

AAAA A 4 carat sign, placed after the digit position, is the exponent formatting specifier that allows space for E+xx to be written.

The significant digits are left-justified and the exponent is adjusted:

```
10 PRINT# 1, USING "##.###AAAA"; 234.56
20 PRINT# 1, USING "##.###AAAA-"; -12.34
30 PRINT# 1, USING "+#.###AAAA"; 12.34
```

2.35E+02, 1.23E+01-, and +1.23E+01 respectively will be written to the file.

INPUT#

FORMAT : INPUT# <file number>, <variable list>

PURPOSE: Reads data items from the specified channel and assigns them to program variables.

COMMENT: The <file number> is the number used when the file was opened for input.

The <variable list> contains the variable names that will be assigned to the items in the file.

When entering numeric variables, the leading spaces, carriage returns and line feeds are ignored.

However, if the first character is a quotation mark, the string item will consist of all characters read between the first and second quotation marks. Thus, a quoted string may not contain a quotation mark as a character. If needed, a quotation mark can be entered by typing a CHR\$(34) in the desired location.

EXAMPLE: Reads a data item from a file named SAMPLE and assigns it as a program variable:

```
10 OPEN "S:SAMPLE" FOR INPUT AS #1
20 INPUT# 1, A$
30 PRINT A$
40 CLOSE # 1
50 END
```

LINE INPUT#

FORMAT : LINE INPUT# <file number>, <string variable>
ENTER

PURPOSE: Reads an entire line (up to 254 characters) from a sequential file to a string variable.

COMMENT: The <file number> is the number under which the file was opened.

The <string variable> is the variable name to which the line will be assigned.

This command reads all characters in the sequential file up to a carriage return (OR 254 characters). The carriage return or line feed, when encountered, is understood as a string ending with a line feed character.

EXAMPLE: Reads an entire line and print it out:

```
10 OPEN "S:SAMPLE" FOR OUTPUT AS #1
20 LINE INPUT "YOUR NAME? "; A$
30 PRINT# 1, A$
40 CLOSE# 1
50 OPEN "S:SAMPLE" FOR INPUT AS #1
60 LINE INPUT# 1, A$
70 PRINT A$
80 CLOSE# 1
```

INPUT\$

FORMAT : INPUT\$ (N, [#] <file number>)

PURPOSE: Reads a string of characters from a sequential file as a string variable and returns a string of a given number "N" of characters.

COMMENT: The <file number> is the number under which the file was opened.

No character will be displayed on the screen unless the string variable is given a print command.

EXAMPLE: Reads a string of 50 characters from #1 and assigns it as a string variable and then print it out:

```
10 OPEN "S:SAMPLE" FOR INPUT AS #1
20 X$ = INPUT$ (50, #1)
30 PRINT X$
40 CLOSE #1
```

SAVE

FORMAT : SAVE "S: <filename>"

PURPOSE: Saves a BASIC program file to the Stringy Floppy Drive in ASCII format.

COMMENT: The letter "S" is the device name of microwafer tape.

Two [A Z] are treated as end-of-file.

EXAMPLE: Saves a BASIC program, TEST, to the microwafer tape in ASCII format:

```
SAVE "S: TEST" 
```

LOAD

FORMAT : LOAD "S: <filename>"

PURPOSE: Loads an ASCII format BASIC program file from the Stringy Floppy Drive.

COMMENT: This command closes all open files and deletes the current program from memory.

Two [A Z] are treated as end-of-file.

EXAMPLE: Loads an ASCII format BASIC program, TEST, from the microwafer tape:

LOAD "S: TEST"

MERGE

FORMAT : MERGE "S: <filename>"

PURPOSE: Merges an ASCII format BASIC program file with the current BASIC program in the computer's memory.

COMMENT: If any lines in the file being merged have the same line number as lines of the program in memory, the lines from the file will replace the corresponding lines in memory.

After the files have been merged, the merged program resides in memory, and BASIC returns to command level.

Two [A Z] are treated as end-of-file.

EXAMPLE: Merges a file, TEST 2, to TEST 1:

MERGE "S: TEST 2"

RUN

FORMAT : RUN "S: <filename>"

PURPOSE: Loads and executes an ASCII format BASIC program file from the Stringy Floppy Drive.

COMMENT: This command closes all open files and deletes the current contents of memory before loading the designated program.

EXAMPLE: Loads and runs a program called SAMPLE from the Stringy Floppy Drive:

RUN "S: SAMPLE"

3.3 AN EXAMPLE

In the example below, most of the SOS commands will be executed to demonstrate how they are applied when performing various routine tasks. If any problem occurs, refer to the statement entry or device entry commands sections of this manual or the appropriate section in your BASIC reference manual for a remedy.

STEPS

1. Load the Stringy Floppy Operating System from the master tape:

BLOAD "CAS:",R

2. After loading the SOS.SYS, format and generate the system on a blank tape for this example session:

_SRUN ("SFORMAT.SYS")

3. Choose option 2 from the Stringy Floppy Formatter, then insert a blank tape and press .

SOS OPERATING COMMANDS

4. After finished formatting, press "X" or to return to BASIC command level.

5. Now, create a program:

```
10 OPEN "S:TEST" FOR OUTPUT AS #1
20 A$ = "ABC"
30 PRINT #1, A$
40 CLOSE #1
```

This program will open the file TEST and write the character string "ABC" onto it.

6. Then, save the program in tokenized BASIC onto the blank tape with the file name SAMPLE1.PRO:

```
__SSAVE ("SAMPLE1.PRO")
```

7. Clear the computer's memory:

```
NEW
```

8. Create another program:

```
110 OPEN "S:TEST" FOR INPUT AS #1
120 IF EOF(1) GOTO 200
130 B$ = INPUT$(1, #1)
140 PRINT B$
150 GOTO 120
200 CLOSE #1
```

This program will read one character from the file TEST once per cycle, then print it out. EOF(1) means "End Of File" and it will check whether all string variables in #1 have been read. If so, the program will go to the specified line number.

9. Save this program in ASCII format with the file name SAMPLE2.PRO:

```
__SSAVE ("SAMPLE2.PRO" "A")
```

or

```
SAVE "S:SAMPLE2.PRO"
```

10. Up to the present moment, 2 programs have been saved. Let's look at the directory of the tape:

```
__SDIR
```

The screen will look like this:

TYPE	FILENAME	REC	ATTR
B	LOADER0 .SYS	15	
B	LOADER1 .SYS	02	
B	SOS .SYS	06	
T	SAMPLE1 .PRO	01	R/W
A	SAMPLE2 .PRO	01	R/W

record(s) remain = XX

11. Write protect SAMPLE1.PRO and run it automatically after SOS.SYS:

```
__SSET ("SAMPLE1.PRO" "0101")
```

SOS OPERATING COMMANDS

12. Look at the directory again:

TYPE	FILENAME	REC	ATTR
B	LOADER0 .SYS	15	
B	LOADER1 .SYS	02	
B	SOS .SYS	06	
T	SAMPLE1 .PRC	01	R/O
A	SAMPLE2 .PRC	01	R/W

record(s) remain = XX

Notice that the attribute of SAMPLE1.PRC has been changed as R/O, and therefore every time after you boot up SOS.SYS from this tape, SAMPLE1.PRC will be autorun.

13. Update the information onto your tape:

_SREMOVE

14. Turn OFF and then turn ON the computer.
15. Load the Stringy Floppy Operating System from this tape.
16. After SOS.SYS is loaded, it will run SAMPLE1.PRC which writes the character string "ABC" onto the opened file TEST.

SOS OPERATING COMMANDS

17. Run SAMPLE2.PRO:

```
_SRUN ("SAMPLE2.PRO")
```

or

```
RUN "S:SAMPLE2.PRO"
```

This will load and execute SAMPLE2.PRO that in turn will read data from the opened file TEST of SAMPLE1.PRO, and print the characters "ABC" one by one with a line feed on the screen.

18. Load SAMPLE1.PRO from the tape:

```
_SLOAD ("SAMPLE1.PRO")
```

19. Merge the program SAMPLE2.PRO from the tape to SAMPLE1.PRO:

```
MERGE "S:SAMPLE2.PRO"
```

20. Save the merged program onto the tape in tokenized BASIC format:

```
_SSAVE ("SAMPLE3.PRO")
```

21. Delete SAMPLE2.PRO:

```
_SKILL ("SAMPLE2.PRO")
```

22. Look at the directory again:

OPERATING COMMANDS

TYPE	FILENAME	REC	ATTR
B	LOADERS .SYS	15	
B	LOADERS .SYS	02	
B	SOS .SYS	06	
T	SAMPLES .PRG	01	R/O
R	TEST .	01	R/W
T	SAMPLES .PRG	01	R/W

records/record = AA

23. Update the information onto the tape:

_SREMOVE

24. Replace the current tape with the master tape:

_SMOUNT

The above example has already introduced you to some basic operation of SOS. You should try to create some more examples to familiarize yourself with the operation of this SVI-777 Stringy Floppy Drive.

4 SOS GRAPHIC COMMANDS

A program called GRAPHIC.SYS allows you to draw pictures, save or load them to or from a microwafer tape, and print them out, by issuing simple commands.

STEPS

1. Load SOS from the master tape.
2. Type: `_SRUN ("GRAPHIC.SYS")`
3. Seconds later, the screen will appear as follows:

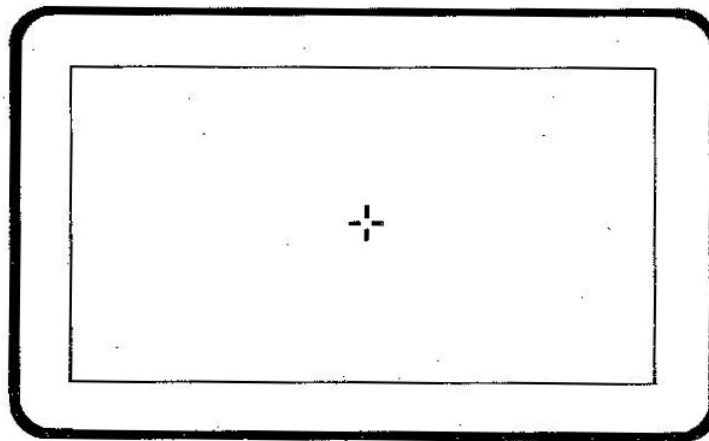


Fig. 4.1 Screen of Graphic Mode

The white cross in the centre represents the X-, Y-coordinate. And the very beginning (default) position is (121, 86). Use the cursor control keys to move the cross. Other keys used for controlling this program are:

- Pressing this key once will enter the drawing mode. A line will be drawn as you move the cross.

Pressing another time will exit the drawing mode. No line will be drawn when you move the cross.

SOS GRAPHIC COMMAND

F 4 - Pressing this key will paint a confined area when the cross is located within it. Notice that the color you want to paint must be the same as the border lines of the area.

F 5 - Pressing once will displayed the X-, Y-co-ordinate on the screen while you move the cross.

Pressing another time will stop changing the X-, Y-co-ordinate while you move the cross.

SPACE BAR - Pressing once will enter the command mode. Notice that all command names must be terminated with an **ENTER**. Or pressing **ENTER** alone or **ESC** will exit the command mode.

THE GRAPHIC COMMANDS

BO Draws a **BOx**

After issuing this command, move the cross to the desired position for the first corner co-ordinate of the box. Press **F 1**.

Then move the cross to the desired position for the second corner co-ordinate of the box. Press **F 2**. The box will then be drawn.

CI Draws a **Circle**

After issuing this command, move the cross to the desired center co-ordinate of the circle. Press **F 1**.

Then move the cross to set the desired length of the radius. Press **F 2**. The circle will then be drawn.

CL Clears the screen

After issuing the command, press Y to confirm. Then the screen will be cleared.

CO Selects Color

After issuing this command, type in the code of the color that you want.

The default color is white (15). The colors of SVI MSX computers are as follows:

color #	color
0	Transparent
1	Black
2	Medium Green
3	Light Green
4	Dark Blue
5	Light Blue
6	Dark Red
7	Cyan
8	Medium Red
9	Light Red
10	Dark Yellow
11	Light Yellow
12	Dark Green
13	Magenta
14	Gray
15	White

OS GRAPHIC COMMAND

R Erases previously drawn graphics

After issuing this command, move the cross over the graphics that you want to erase from the screen.

When finished using this mode, press **SPACE BAR** to select color for drawing again.

X Exits to BASIC command level

Pressing **Y** to confirm after issuing this command will return the program to BASIC command level.

I Draws a Line

After issuing this command, move the cross to the desired starting co-ordinate of the line. Press **F 1**.

Then move the cross to the desired ending co-ordinate of the line. Press **F 2**. The line will then be drawn.

L Loads a screen from a microwafer tape to the computer's RAM

After issuing this command, you must enter the filename of the screen that you stored on a microwafer tape. Then the screen will be loaded into the computer's RAM.

M Loads the directory (MOUNT) of the current microwafer tape

When a new microwafer tape is inserted, this command loads the directory from it. Press **[Y]** to confirm that the new tape is ready.

Remember to issue this command every time you change the tape; otherwise, no files on the new tape can be accessed.

PR Prints the screen

The following printer options are available:

- 0 - MSX printer
- 1 - Epson printer
- 2 - Riteman printer

Then choose the printing modes: -

- 0 - inverse (inverse printing with black background)
- 1 - normal (normal printing with white background)

Remember to prepare your printer beforehand.

RE Updates the directory (REmove) of the current microwafer tape

When a file has undergone certain changes, such as being renamed, deleted, or saved, this function must be called before removing the tape; otherwise, no changes will be recorded and a fatal error will result.

SA SAVes the current screen to a microwafer tape

After issuing this command, you must enter a filename of the screen that you want to stored onto a microwafer tape. Then the screen will be saved onto the microwafer tape.

At least 15K storage capacity is required for each screen.

SOS GRAPHIC COMMAND

TX Types Text onto the screen

After issuing this command, you can print a character string (maximum 15 characters) from the current position.

All of the above graphic commands can be issued in upper-case or lower-case letter but not a mixture of both.

5 WAFER EDITOR

On the master tape, the program called WAFER EDITOR can help advanced users to edit a particular sector of the tape. Follow the procedure below to read, write or modify sectors.

STEPS

1. Load SOS.SYS.
2. TYPE: `_SRUN ("WAFERED.SYS")`
3. Then the screen will appear as follows:

```
SVI-777 Stringy Floppy utility
wafer editor release 1.00

1 -- locate
2 -- read sector
3 -- read file
4 -- write sector
5 -- edit

input function select ( 1--5 )
or ctrl-c to exit
>
```

Fig. 5.1 Screen of Wafer Editor

4. Choose the desired option from this menu. Their meanings and functions are:

1-locate Selects a specified sector on the tape

2-read sector Reads the selected sector

If no specified sector, the default sector to be read is 1 when powering up, or the last read.

WAFER EDITOR

Usually a block of 16 lines of data within the specified sector will be displayed in the format of:

```
XXXX DD DD DD DD DD DD DD DD YYYYYYYY
```

where XXXX is the location of the data within the sector;

DD is the data itself in hexadecimal format; and

YYYYYYYY is the data in ASCII code.

3-read file Reads the whole of a specified file
The data of the file will be displayed sector by sector.

4-write sector Updates the data onto the tape

5-edit Enters edit mode

A sector must be read before entering this mode.

When data is found, press AC, and then input the offset location, or another AC to exit this mode.

Enter a legal hexadecimal value to replace the original and press to go to the next data.

Or just press to skip without changing the current one.

Apply the same method for the editing of all the subsequent data.

WAFER EDITOR

After finishing editing, press AC will return the program to the previous step and display the current corrected block of data.

6 SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM

6.1 PHYSICAL CHARACTERISTICS

SECTOR SIZE	1 Kbyte
SHORTEST TAPE LENGTH	14 Kbytes approximately
LONGEST TAPE LENGTH	100 Kbytes approximately
BAUD RATE	13.2 Kbaud

6.2 FILE FORMAT

There are 3 types of files supported by the Stringy Floppy Operating System:

FILE TYPE	END OF FILE
TOKENIZED BASIC	1AH, 1AH
ASCII	1AH, 1AH
BINARY <loading start address> <loading end address> <execution start address>	1AH, 1AH

6.3 TAPE FORMAT

There are two kinds of tape - Master Tape and User Storage Tape. Their formats are shown as follows:

6.3.1. User Storage Tape

All the sectors on the User Storage Tape are in Stringy Floppy Format. And the first sector containing the storage characteristic of the tape is called SYSTEM SECTOR which is shown below:

0000H	File Allocation Table 256 bytes
00FFH	Directory 45 Directory Entry 16 bytes per Entry 720 bytes
03CFH	Reserved Area 44 bytes
03FBH	System Area 4 bytes
03FFH	

SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM

File Allocation Table (FAT)

FAT Entry Size	1 byte with:
	00 = the corresponding sector is unused and available
	ff = the last sector of a file
	xx = any other hexadecimal character that is the next sector of the file
No. of FAT Entry	256
Total FAT Size	256 bytes
Offset	0 - 0FFH

Directory Characteristic (DIR)

No. of Directory Entry per tape	45
Directory Entry Size	16 bytes
Total Directory Size	720 bytes
Offset	100 - 3CFH
Directory Entry Format:	
<u>OFFSET</u>	<u>MEANING</u>
0 - 7	Filename
	00 in byte 0 indicating this directory entry is not used

SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM

8 - 10	Filename Extension
11	File Attribute
b1 - b0	: File Type Indicators
	00 - BASIC Token File
	01 - ASCII File
	10 - Binary File
	11 - Inhibited
b2	: Read Inhibited Indicators
	0 - Can be loaded or run by SOS
	1 - Cannot be loaded or run by SOS
b3	: Write Inhibited Indicators
	0 - Can be overwritten or deleted by SOS
	1 - Cannot be overwritten or deleted by SOS
b4	: Autorun by LOADER1 indicators
	0 - Not autorun by LOADER1
	1 - Autorun by LOADER1 (must be a Binary file between 4000H - 0F300H)
b5	: Autorun by SOS indicators
	0 - Not autorun by SOS
	1 - Autorun by SOS (can be any type of file. If in Binary format, it must be between 8000H - 0F300H)

SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM

b6	: Stringy Format Indicators
	0 - In Stringy Floppy format
	1 - In Cassette format
b7	: System File Indicators
	0 - Not System File
	1 - System File provided by SVI
12 - 13	Reserved
14	File size in sectors
15	Start sector number The first sector number of the current file

Reserved Area

Total 44 bytes (3D0H - 3FBH)

System Area

	SIZE (byte)	OFFSET
Tape Size in Sectors	1	3FFH
Sectors Remain Unused	1	3FEH
Number of Directory Entry	1	3FDH
Directory Entry Used	1	3FCH

6.3.2 Master Tape

The Master Tape, besides having the same first sector as the User Storage Tape, contains some more files: LOADER0.SYS, LOADER1.SYS, SOS.SYS, and some utility programs. Its format is as below:

System Sector 1 sector
Storage Sector left for user size depending on tape
LOADER0.SYS in cassette format 15 sectors
LOADER1.SYS 2 sectors

LOADER0.SYS

This file is in cassette format and is used to load the LOADER1.SYS that loads the proper autorun file afterwards. This file is loaded and run under MSX BASIC by typing:

```
BLOAD "CAS:[BOOT]",R
```

SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM

LOADER1.SYS

This file is in Stringy Floppy format and its main functions are:

- Print sign on messages
- Search RAM locations 4000H to 7FFFH
- Boot up the system sector
- Check whether autorun file exists (bit 4 of file attribute in directory entry)
- Load and run the autorun file
- Return to BASIC command level if no autorun file (in this case, the Stringy Floppy Drive is inactive)

6.4 STRINGY FLOPPY OPERATING SYSTEM

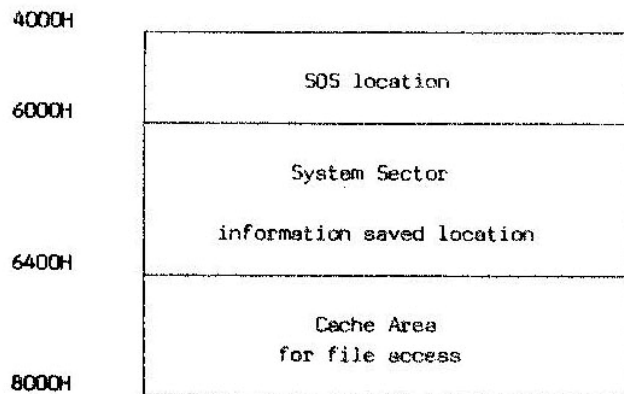
6.4.1 General Features

The Stringy Floppy Operating System is compatible with the MSX BASIC. The system enables the user to create and keep track of files in the Stringy Floppy Drive.

Usually, this system file is set to be a "LOADER1 - autorun file". Once loaded, it will move itself to the RAM area of the starting address 4000H. Then all the required parameters in MSX BASIC system area are set accordingly.

Control may then be passed back to MSX BASIC depending on whether a "SOS - autorun file" exists (bit 5 of file attribute in directory entry). Here, the "SOS - autorun file" can be in Tokenized BASIC, ASCII or Binary format.

SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM



6.4.2 System Routine Entry Point

Addresses of useful routines and values of system variables in SOS are grouped in two tables, with table starting addresses 4010H and 4014H respectively. Besides a word "sf" is marked to indicate to user the address of 4018 or 4019 for identifying location.

USEFUL ROUTINE TABLE

OFFSET	FUNCTION	COMMENT
00H	SLOAD handler	Statement entry for "_SLOAD" entry: iy = text pointer exit : nc => ok

SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM

OFFSET	FUNCTION	COMMENT
0AH	SREMOVE handler	Statement entry for " _SREMOVE" entry: iy = text pointer exit : nc => ok
0CH	SMOUNT handler	Statement entry for " _SMOUNT" entry: iy = text pointer exit : nc => ok
0EH	SRUN handler	Statement entry for " _SRUN" entry: iy = text pointer exit : nc => ok
10H	SSET handler	Statement entry for " _SSET" entry: iy = text pointer exit : nc => ok

SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM

OFFSET	FUNCTION	COMMENT
12 - 15H	Reserved handler	Reserved for new statement
16H	OPEN handler	Device entry for "OPEN"
18H	CLOSE handler	Device entry for "CLOSE"
1AH	RANDOM handler	Device entry for "RANDOM"
1CH	SEQUENTIAL OUT handler	Device entry for "SEQUENTIAL OUT"
1EH	SEQUENTIAL IN handler	Device entry for "SEQUENTIAL IN"
20H	LOC handler	Device entry for "LOC FUNCTION"
22H	LOF handler	Device entry for "LOF FUNCTION"
24H	EOF handler	Device entry for "EOF FUNCTION"

SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM

OFFSET	FUNCTION	COMMENT
26H	FDOS handler	Device entry for "FDOS FUNCTION"
28H	BACK UP handler	Device entry for "BACK UP"
2AH	Read Sector	Hardware read sector routine entry: hl = buffer head de = sector number exit : no => ok
2CH	Write Sector	Hardware write sector routine entry: hl = buffer head de = sector number exit : no => ok
2EH	Fast Forward	Fast Forward exit : no => ok
30H	Motor On	Motor On exit : no => ok

SOFTWARE SPECIFICATION OF STRINGY FLOPPY OPERATING SYSTEM

OFFSET	FUNCTION	COMMENT
32H	Motor Off	Motor Off exit : no => ok
34 - 3FH	Reserved	Reserved for other routine

* - table starting address stored in location 4010H

- Number of useful routine stored in location 4012H

SYSTEM VARIABLE TABLE

OFFSET	VARIABLE NAME	COMMENT
00H	System Sector	Location of System Sector
02H	No. of Statement	Number of Statement Handler
04 - 0FH	Reserved	Reserved

* - table starting address stored in location 4014H

- No. of system variable stored at 4016H

APPENDIX A SPECIFICATIONS

External Dimension	63 x 153 x 198 (H x W x D mm)	
Features (Front)	Insert Slot "In Use" and "Power" Indicators	
(Rear)	Power Switch - External Cassette Socket Cassette and Joystick Plugs for connection	
Power Source	2 Size D (UM-1) 1.5 V Batteries for Motor (batteries life approximately 6 hrs/day a month) 5 V Power Supply for System from MSX Computer directly	
Data Transfer Rate	13.2 Kbit/second (11 times faster than data cassette)	
Tape Capacity (Approximately)	LENGTH (feet)	CAPACITY (Kbytes)
	10 20 35 50 62	14 26 52 74 100

APPENDIX B I/O MAP

JOYSTICK PLUG

PIN	SIGNAL NAME	DESCRIPTION
1	RD CLK	Read Clock
2	RD DATA	Read Data
3	CASS SENSE	Stringy Floppy Drive Sense
4	EXT CASS ON	External Cassette is sending data to computer
5	VCC	+ 5V Power Line
6	WR DATA	Write Data to Stringy Floppy Drive
7	N. C.	Not Connected
8	N. C.	Not Connected
9	GND	Power Ground

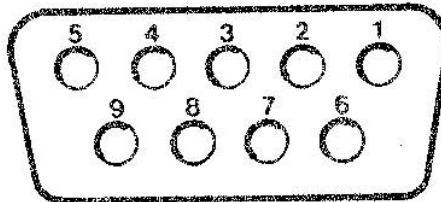


Fig. B.1 Joystick Plug Pin Connection

APPENDIX B

CASSETTE PLUG

PIN	SIGNAL NAME	DESCRIPTION
1	GND	Power Ground
2	GND	Power Ground
3	GND	Power Ground
4	MF IN	Input to Stringy Floppy Drive
5	MF OUT	Output from Stringy Floppy Drive
6	MTRON+	Stringy Floppy Drive Motor on (+)
7	MTRON-	Stringy Floppy Drive Motor off (-)
8	GND	Power Ground

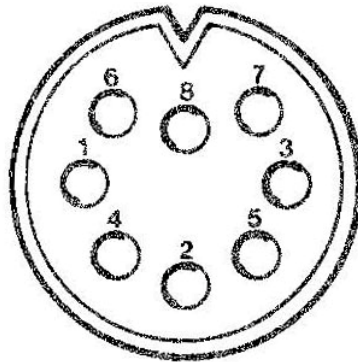


Fig. B.2 Cassette Plug Pin Connection

EXTERNAL CASSETTE SOCKET

PIN	SIGNAL NAME	DESCRIPTION
1	GND	Power Ground
2	GND	Power Ground
3	GND	Power Ground
4	DMTOUT	Output to External Cassette
5	DMTIN	Input from External Cassette
6	REM+	Remote (+) for External Cassette
7	REM-	Remote (-) for External Cassette
8	GND	Power Ground

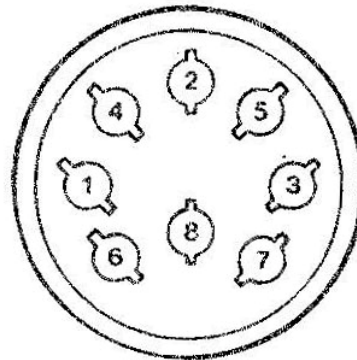


Fig. B.3 External Cassette Socket Pin Connection

APPENDIX C COMMAND SUMMARY

STATEMENT ENTRY COMMANDS

COMMAND	FORMAT
_SDIR	_SDIR Lists names of files on a specified microwafer tape
_SKILL	_SKILL (" <filename> ") Deletes a specified file
_SLOAD	_SLOAD (" <filename> " [<file type>]) Loads a specified file to the computer's RAM
_SMOUNT	_SMOUNT Loads the directory from the current microwafer tape
_SREMOVE	_SREMOVE Updates the directory of the current microwafer tape
_SREN	_SREN (" <new filename> " " <old filename> ") Changes the name of a specified file
_SRUN	_SRUN (" <filename> " [<file type>]) Executes a specified file

APPENDIX C

COMMAND	FORMAT										
_SSAVE	<p>_SSAVE ("<filename>" ["T"]) Saves a program in Tokenized BASIC</p> <p>_SSAVE ("<filename>" "A") Saves a program in ASCII format</p> <p>_SSAVE ("<filename>" "[H]<loading start address>" "[H]<loading end address>" ["[H]<execution address>"]) Saves a program in Binary format</p>										
_SSET	<p>_SSET ("<filename>" "<four character string>") Sets the Read/Write status of a program and specifies whether it is an autorun file</p> <table border="1" data-bbox="516 940 1167 1514"> <thead> <tr> <th data-bbox="516 940 699 1024">POSITION</th> <th data-bbox="699 940 1167 1024">VALUE</th> </tr> </thead> <tbody> <tr> <td data-bbox="516 1024 699 1150">1</td> <td data-bbox="699 1024 1167 1150"> 0 NOT READ PROTECTED 1 READ PROTECTED </td> </tr> <tr> <td data-bbox="516 1150 699 1276">2</td> <td data-bbox="699 1150 1167 1276"> 0 NOT WRITE PROTECTED 1 WRITE PROTECTED </td> </tr> <tr> <td data-bbox="516 1276 699 1402">3</td> <td data-bbox="699 1276 1167 1402"> 0 NOT AUTORUN BY LOADER1 1 AUTORUN BY LOADER1 </td> </tr> <tr> <td data-bbox="516 1402 699 1514">4</td> <td data-bbox="699 1402 1167 1514"> 0 NOT AUTORUN BY SOS 1 AUTORUN BY SOS </td> </tr> </tbody> </table>	POSITION	VALUE	1	0 NOT READ PROTECTED 1 READ PROTECTED	2	0 NOT WRITE PROTECTED 1 WRITE PROTECTED	3	0 NOT AUTORUN BY LOADER1 1 AUTORUN BY LOADER1	4	0 NOT AUTORUN BY SOS 1 AUTORUN BY SOS
POSITION	VALUE										
1	0 NOT READ PROTECTED 1 READ PROTECTED										
2	0 NOT WRITE PROTECTED 1 WRITE PROTECTED										
3	0 NOT AUTORUN BY LOADER1 1 AUTORUN BY LOADER1										
4	0 NOT AUTORUN BY SOS 1 AUTORUN BY SOS										

LEVEL 1 ENTRY COMMANDS

COMMAND	FORMAT
CLOSE	CLOSE [[#]<file number> [.#]<file number>...] Closes the file that has been opened
INPUT#	INPUT# <file number>, <variable list> Reads data items from the specified channel and assigns them to program variables
INPUT\$	INPUT\$ (N, [#]<file number>) Reads a string of characters from a sequential file to a string variable
LINE INPUT#	LINE INPUT# <file number>, <string variable> Reads an entire line from a sequential file to a string variable
LOAD	LOAD "S: <filename>" loads an ASCII format BASIC program file from the stringy floppy drive
MERGE	MERGE "S: <filename>" Merges an ASCII format BASIC program file with the current BASIC program in the computer's memory
OPEN	OPEN "S:<filename>" FOR <mode> AS {#}<file number> Reads or writes file through the stringy floppy drive

APPENDIX C

COMMAND	FORMAT
PRINT#	PRINT# <file number>, <list of expressions> Writes data to the specified channel
PRINT# USING	PRINT# <file number>, USING <string expression>; <list of expressions> Writes data to the specified channel in a specified format
RUN	RUN "S: <filename>" Loads and executes an ASCII format BASIC program file from the stringy floppy
SAVE	SAVE "S: <filename>" Saves a BASIC program file to the stringy floppy drive in ASCII format

GRAPHIC COMMANDS

COMMAND	MEANING
BO	Draws a box
CI	Draws a circle
	Clears the screen
CO	Selects color
ER	Erases previously drawn graphics
EX	Exits to BASIC command level
LI	Draws a line
LO	Loads a screen from a microwafer tape to the computer's RAM
MO	Loads the directory of the current microwafer tape
PR	Prints the screen
RE	Updates the directory of the current microwafer tape

APPENDIX C

COMMAND	MEANING
SA	Saves the current screen to a microwafer tape
TX	Types text onto the screen