



158 CAMBERWELL ROAD,
LONDON, SE5 0EE

01-701 8668
01-703 6155

Telex No.: 295931 Unicom G

NOTES TO NEW USERS

1. Look at the "readme" file on the disk by typing LOAD *1;"readme"
This will provide you with information on enhancements to the software made since the manual was written.

2. The utility disk should be copied for security. It is a specially formatted disk and should be copied as follows:-

Type LOAD *1;"utility"

RUN

Select the FORMAT option and format a new disk.

type LOAD *1; "utility backup"

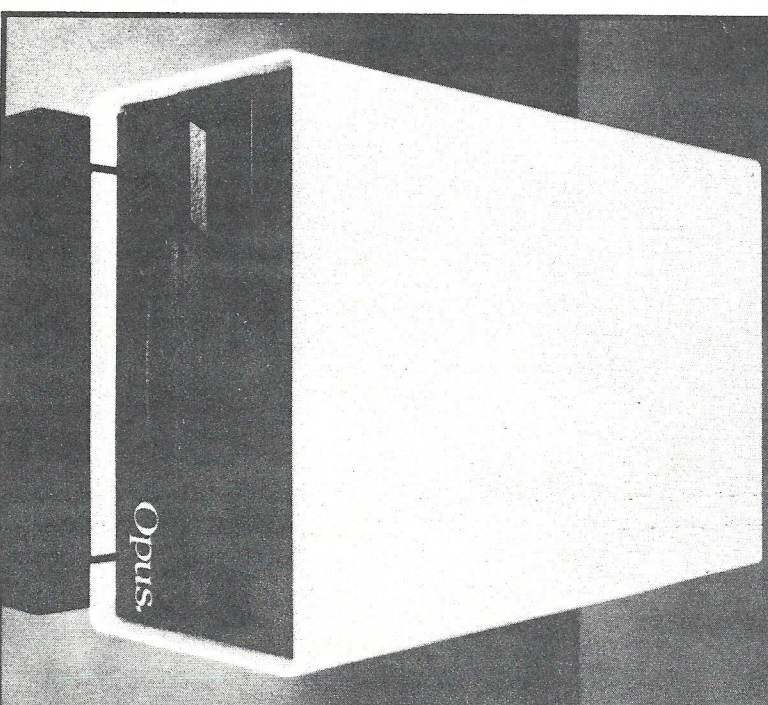
RUN

This programme is supplied only to backup the utility disk provided.
For backing up you own disk use "utility".

3. The RAM upgrade is provided to those who have had to wait for their interface free of charge.
4. TAPEDISC. Since the interface was first advertised, the software has been enhanced so that the Spectrum will still run all tape based software, and read programs from the cassette interface. This has removed the requirement for a special TAPEDISC utility. To transfer unprotected programs from tape to disc, simply load from cassette and save to a disk file.

Opus.
Opus Supplies Ltd.,

**DISC MANUAL
FOR THE
SPECTRUM COMPUTER**



SPECTRADOS

Opus.
Opus Supplies Ltd.,
158 Camberwell Road,
London SE5 0FE.
Tel: 01-701 8668
01-703 6155/6/7

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Introduction

The OPUS disc system for your Sinclair SPECTRUM computer will enable you to save and retrieve programmes and data in the same way that you can with a cassette recorder. It has been designed to be as compatible with the Sinclair microdrive system as possible to enable easy conversion of existing programmes.

The advantages over a tape based system are:

1. Programmes can be saved and loaded more quickly.
2. Information can be accessed much more quickly - the simplest analogy here is with a record and cassette of the same pieces of music. If you wish to play a given piece of music you can position the turntable arm at the start of the track and play the music immediately. With a cassette you have to wind the tape on to as near the correct position as you can and then wait for the piece that you want to start.
3. Loading and saving is more reliable. There is no worry about volume and tone controls.
4. A catalogue of the contents of the disc is available immediately.

Because of the way that the disc and microdrive systems both page their ROMs in and out they cannot be used together.

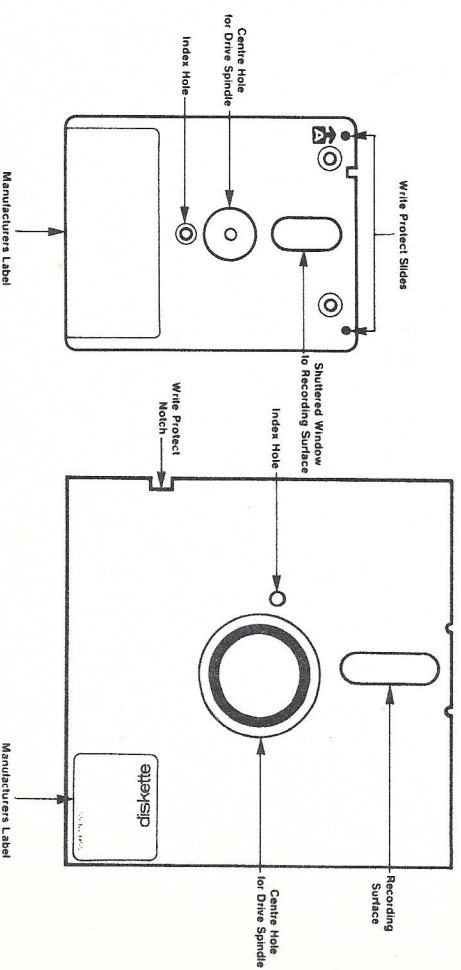
Getting Started

The disc system consists of three parts. The disc interface, the disc drive, and the magnetic disc itself.

The disc interface consists of the hardware and software necessary to enable your SPECTRUM computer to transfer information to and from the selected disc drive. This system allows one or two disc drives to be used. The first drive on the system is set up for use as drive number one. When adding a second drive this must be set up for use as drive number two and this should be specified when ordering.

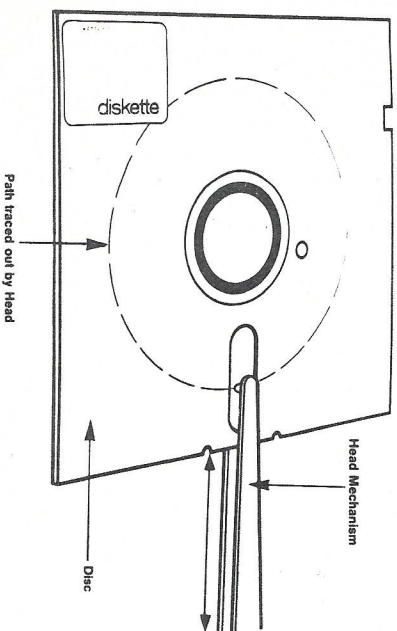
The disc drive uses a standard Shugart interface which decodes the control signals from the SPECTRUM disc interface and reads or writes information to the disc. If the disc drive is double sided both sides of the disc are used automatically, there is no need to specify which side is to be used. The OPUS disc system is supplied with a number of different disc drive options. Any differences in operation are mentioned as they arise and any extra details necessary are given in Appendix 1.

The magnetic disc is a circular flexible disc with a magnetic coating. For protection this disc is enclosed in a case and access to the recording surface is through a window. (On no account touch the exposed recording surface, see the notes on the care of discs in Appendix 1).

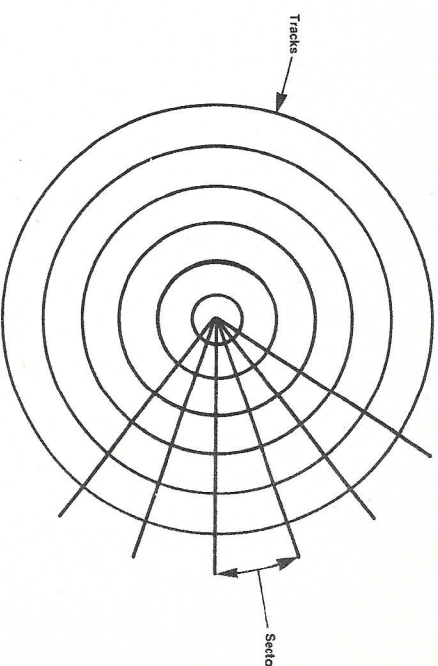


The write protection notch (or slide) shown in the diagrams enables the disc to be 'write protected'. When protected in this way (see Appendix 1) the disc cannot be written to, thus protecting the contents.

When reading (or writing) the head moves across the disc to the required position and the information is read (or written) as the disc rotates under the head. Unlike a record the information is not recorded on a continuous spiral path, but, on a series of concentric circles. The disc head can be moved in and out across the surface to a number of fixed positions. Once in position the head traces out a circular path, or track, on the disc as it rotates. The number of tracks on each side of the disc depends upon the disc drive being used and is usually either forty or eighty. On a double sided drive there are two heads, one on each side of the disc, and this gives two circular tracks for each position of the heads.



Each track holds a large amount of data and is therefore further divided into a number of equal parts, each part is called a sector. On the SPECTRUM disc system each track is divided into eighteen sectors.



Each sector holds 256 bytes and so a single sided, forty track disc will hold up to 1 80 Kbytes (1 Kbyte is 1 024 bytes). Other disc drives will hold multiples of this figure, and so a double sided, eighty track disc will hold 720 Kbytes (four times the original amount).

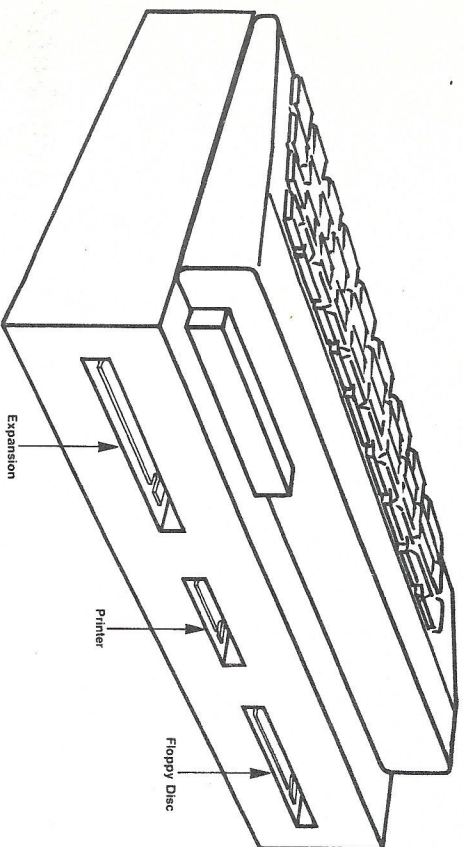
For location purposes each sector has an identification marker, these markers are not written with the information, but, must be written before the disc can be used. The process of writing these markers is called formatting the disc and a programme to do this is provided on the utility disc.

Information is stored on the disc in files, each file is given a name when it is first written to the disc. To enable a file to be found when required the disc system keeps a catalogue of the files on the disc. The catalogue contains the name and location of each file on the disc together with other information used by the disc operating system. The catalogue is itself a file and this means that there is no restriction on the number of files allowed except the space available on the disc itself. The contents of a disc can be seen by listing the catalogue and we will see how to do this as soon as your system is installed.



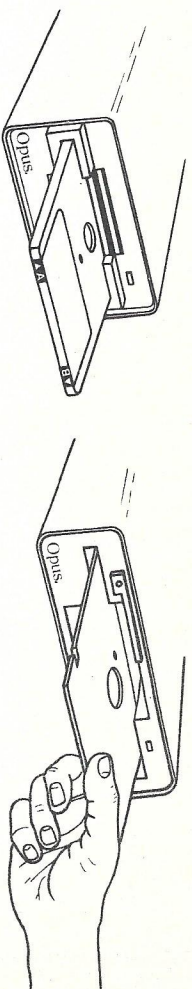
Installation

The disc interface unit is designed as a base for the SPECTRUM computer. To connect the computer and the interface turn the power off and then place the computer on the interface unit. Align the edge connector on the interface with the connector in the expansion socket and slide the computer back into place. Screws are provided for those who wish to hold the units together as a single unit.



Looking at the back of the interface unit the right hand connector is for connection to the disc drive. The one on the left is a replacement for the expansion socket to allow other SPECTRUM peripherals to be used and the one in the centre is for the parallel printer. Connection to the disc drive is achieved with a cable fitted with a 34 way edge connector at each end. This cable is provided for those purchasing the interface unit and disc drive together. For those just purchasing the interface unit a suitable cable is available from OPUS Supplies Ltd.. The edge connectors are fitted with a key and only fit in one way. Plug the connectors into the interface unit and the disc drive. Having checked your connections you are ready to turn the power on and to use the system.

A tutorial on the use of the system is provided in the next chapter, but, for the moment just follow the instructions to test your unit. First make sure that your utility disc is write protected (see Appendix 1). Then holding the utility disc with the label furthest towards the drive insert the disc, close the arm (which covers the heads onto the disc).



Some 5 1/4" disc drives may have two lips instead of a rotating arm and these should be squeezed together until they click into place. For those with 3" drives the disc should be inserted with the A1 pointing up and should be pushed home until it clicks into place. The 3" drives supplied by OPUS Supplies are double sided and the disc will only fit in one way. If it is inserted upside down it will not click into place.

Now type

[CAT]1 [ENTER]

SPECTRUM commands obtained with a single keystroke are enclosed in square brackets when first introduced. After this they will only be enclosed in brackets where any confusion may arise. The disc drive should start up and the disc catalogue should be displayed. If it fails to do this turn the power off and recheck all connections. Then try again. If the system still fails to work then contact the dealer who supplied your unit. If purchased direct from OPUS Supplies Ltd. then contact them for further advice.

Formatting a Disc

We are now ready to format a disc. To do this insert the utility disc into drive number one and type

[LOAD]* "m",1,"utility" [ENTER]
[RUN] [ENTER]

These commands load and run the utility programme. Select the disc format option. The programme will then ask which drive contains the disc that you wish to format, how many tracks it has, whether the drive is double sided and also for a title for the disc (the title can be up to thirty characters long). When these questions have been answered the programme will ask 'Are you sure?', make sure before answering yes that the disc in the drive that you have specified is one that you wish to format. Formatting a disc erases any information that was stored upon it and so you must be careful not to format any disc containing information that you want to keep.

Catalogue the newly formatted disc and compare this with the catalogue of the utility disc. The newly formatted disc has the title that you specified and has no files present.

Disc Backup

You should now make a copy of the utility disc. To do this run the utility programme again and select the disc backup option. If you are using a single drive the programme will tell you when to insert the source and destination discs. Once the backup is completed you should put the original utility disc in a safe place as a master copy. You should always keep backup copies of important files.

Having installed the system and checked that it works the next Chapter is a tutorial on the use of the system for storing programmes and data.

Using the System

Programme Storage

The commands for programme storage are [LOAD]*, and [SAVE]*. These have the same effect as the corresponding cassette commands and are described below.

Insert your copy of the utility disc into drive number one and as before type

[LOAD]*"m":1;"utility" [ENTER]

This will load the file called **utility** from the disc in drive number 1. To save the programme on another formatted disc insert it into drive number one and type

[SAVE]*"m":1;"utility" [ENTER]

You can check that this has been done by cataloging the disc, i.e. by typing

[CAT]1 [ENTER]

The file named 'utility' should now appear in the catalogue of the new disc.

LOAD* and SAVE* can also be used to save machine code programmes by using the CODE option.

[SAVE]*"m":1;"mcode"[CODE]32500,67 [ENTER]

will save the 67 bytes of code starting from memory location 32500. This can be reloaded when required by the corresponding load command

[LOAD]*"m":1;"mcode"[CODE]32500 [ENTER]

The command, as used above, does not check that the space that you have allowed for the machine code is large enough. If you have set aside 100 bytes for a machine code programme you can make sure that other memory is not overwritten by specifying the length in the load command

[LOAD]*"m":1;"mcode"[CODE]32500,100 [ENTER]

If the code in the file 'mcode' is larger than 100 bytes an error report will be generated.

Using CODE any block of memory can be saved, it does not have to be machine code. To save the screen, for example, the command

[SAVE]*"m":1;"screen"[CODE]16384,6912[ENTER]

should be used. This can then be redisplayed by using the corresponding LOAD command

[LOAD]*"m";1;"screen"[CODE]16384,6912[ENTER]

The **m** in the command specifies that it is a file operation which works in a similar way to the corresponding microdrive command. When loading a file if the file does not exist an error report 'file not found' will be generated. When saving a file if the file does not exist then a new file is created and the programme or code saved to that file. If the file already exists then, unlike in the microdrive system, it will be overwritten.

Data Storage

Data is information in a form that can be processed by the computer. In the case of the SPECTRUM this information is handled eight bits (one byte) at a time. Data can be said to flow around the system. Using this analogy a series of bytes moving around the system is called a data stream. At any instant there may be several streams of data in existence and these will be 'linked' to various input or output devices. Streams are identified by a number from 0 to 15 and the input/output devices by a letter (with no distinction between upper and lower case letters).

Although stream numbers can take values from 0 to 15 streams 0, 1 and 2 are already assigned and should not be changed. The assignments for streams 0 to 2 are:

0 and 1 are used for input from the keyboard and for output to the lower half of the screen. Used by INPUT and INKEY\$ (not INPUT# or INKEY\$# these use the specified streams)

2 used for output to the upper part of the screen. Used by PRINT and LIST.

Stream 3 is automatically assigned to the ZX printer, but, it can be reassigned if you wish. This is useful if you wish to redirect output to the ZX printer as stream 3 is automatically used by LPRINT (not by LPRINT# which uses the specified stream) and LIST.

Data streams are linked to specific input or output devices (known as channels).

The possible output channels are:

- "S" - the upper part of the screen
- "P" - the ZX printer
- "m" - output to a file
- "b" - output to the parallel printer port (see Chapter 5)

The possible input channels are:

- "K" - the keyboard (also outputs to the lower half of the screen).
- "m" - input from a file

The "m" channel needs further information to specify it completely. In particular, [IN] and [OUT] are used to indicate whether the file channel is to be used for input or output. As with SAVE*, if the file channel is used for output and the file exists it will be overwritten.

Apart from the streams 0 - 3, streams and channels are 'linked' by using the [OPEN#] command

[OPEN#]4,"S"

associates stream number four with the screen, channel "S". After this command any character printed to stream four will go to the screen and so the command

[PRINT]#4;"Hello"

will display the word 'Hello' on the top half of the screen. While if the command had been **[OPEN#]4,"P"** the characters would have been sent to the ZX printer, channel "P".

Type in the following programme:

```
10 OPEN# 4,"m";1;"Telephone"[OUT]
100 INPUT "Name? ";n$,"Tel. No? ";t$
110 PRINT #4;n$
120 IF n$="end" OR n$="END" THEN CLOSE #4: STOP
130 PRINT #4:t$
140 GO TO 100
```


Run the programme and type in some names and telephone numbers. Finish the list with 'end' (or 'END') and any telephone number. The programme creates a data file containing the names and telephone numbers that you entered. List the programme. The file **Telephone** on drive number 1 is opened for **OUTPUT** using stream number four. The data that is input is then printed to the file using stream number four. The name 'end' is used to indicate the end of the list and is sent to the file to act as an end of file marker. The channel is then closed and the programme stops. The file 'Telephone' will now appear in the catalogue of the disc.

Now type in this second programme:

```
10 OPEN# 4,"m",1;"Telephone"[IN]
100 INPUT #4;n$
110 PRINT n$,
120 IF n$="end" OR n$="END" THEN CLOSE #4: STOP
125 INPUT #4;t$
130 PRINT t$
140 GO TO 100
```

The file is opened for **INPUT** this time and the names and telephone numbers are input and printed on the screen. When the name 'end' is obtained we have reached the end of the file and the channel is closed and the programme stops. Notice the similarity in the two programmes. The only difference is in the source and destination of the data.

The list of telephone numbers can be extended by using this programme:

```
10 OPEN# 4,"m",1;"Telephone"[IN]
20 OPEN# 5,"m",1;"Telephone1"[OUT]
100 INPUT #4;n$
110 IF n$="end" OR n$="END" THEN CLOSE #4: GO TO 200
120 INPUT #4;t$
130 PRINT #5;n$
140 PRINT #5;t$
150 GO TO 100
200 INPUT "Name? ";n$,"Tel. No? ";t$
210 PRINT #5;n$
220 IF n$="end" OR n$="END" THEN CLOSE #5: STOP
230 PRINT #5;t$
240 GO TO 200
```

The original list in the file 'Telephone' is copied to the new file 'Telephone1' and then any extra names and telephone numbers are added. At the end, the file 'Telephone1' contains all of the names and telephone numbers. Unless you wish to use it again the file 'Telephone' can be wiped from the disc by typing

[ERASE]"m",1;"Telephone"[ENTER]

If you now catalogue the disc you will see that the file 'Telephone' no longer appears.

Note that after using a channel other than the screen the commands **INK** and **PAPER** may not work. To avoid this problem include the command **PRINT**, before using **INK** or **PAPER**.

Output of Data

PRINT"hello" sends the stream of characters h,e,l,l,o,[ENTER] to the upper half of the screen, but, so does **LPRINT**#2;"hello". The first command uses the defaults - **PRINT** uses stream 2 which is assigned to the "S" channel. The second command uses stream 2 because it is the one that is specified. The two commands

```
OPEN# 4,"S"
PRINT #4;"hello"
```

also have the same effect.

```
OPEN# 10,"m",1;"message"[OUT]
PRINT #10;"hello"
```

sends the same stream of characters to the file 'message' on drive number 1.

Input of Data

Input statements can be assigned to channels in a similar way. Care must be taken when using **INPUT**#, as this can also try to output to the channel. **INPUT a\$;b\$** gets a\$ from the keyboard (terminated by **ENTER**) and then moves the cursor to the second half of the line ready for b\$ to be input. The use of the comma as a separator forces output to the channel. In the case of the **INPUT** statement this is expected and the output goes to the lower half of the screen. When using **INPUT**# with channels which cannot be used for output the use of a comma as a separator will generate an error report. Either use separate **INPUT**# statements

```
INPUT #6;a$
INPUT #6;b$
```

or use semicolons as separators

```
INPUT #6;a$;b$
```

Note also that the **INPUT**# and **INPUT** statements expect each item to be followed by **[ENTER]**. When printing to a file this can be achieved by printing the items separately or by including an apostrophe as a separator for the items. e.g.

```
PRINT #5;n$'number
```


File Processing One Byte at a Time

Information can be written to a file (or any other open output channel) a character at a time by using, for example,

```
PRINT #5;"P";
```

for printable characters and

```
PRINT #5;CHR$(4);
```

for non-printable characters. Note that the semi-colon at the end of the print statement means that only the single character is output.

Characters can be input from an open file (or any other open input channel) by using

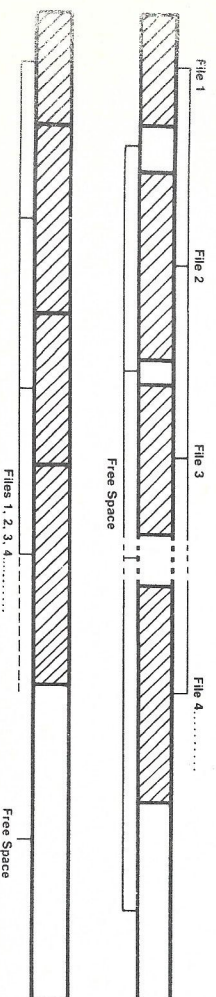
```
LET a$=[INKEY$ ]#4
```

If using this care must be taken when choosing how to indicate the end of the file. Trying to read past the end of the file will cause an error report to be generated. A sequence of characters which will not occur in the data must be used.

Compacting the Disc

The disc system stores the files on the disc on consecutive sectors. After some use, saving and erasing files, the space on the disc becomes fragmented with small numbers of sectors that cannot be used. To make use of these sectors the disc must be compacted. This process moves the files so that they are adjacent and therefore combines all of the free space.

To compact a disc load and run the utility programme and select the compact a disc option. Once started the process must be allowed to finish or some files may be lost.



Reference Guide

This reference guide gives details of the additional commands available when using the disc system. The following notation is used:

<drive> represents the drive number which can be 1 or 2.

<stream> represents the stream number. Stream numbers can be any integer from 0 to 15. Stream numbers from 0 to 2 are reserved by the system; 0 and 1 for the keyboard and lower part of the screen and 2 for the top part of the screen. Stream number 3 defaults to the ZX printer but can be reallocated so that LPRINT and LLIST commands sent output elsewhere.

<filename> any string of 1 to 10 characters enclosed in quotes e.g. "utility" or "READ ME"

<file spec.> represents the specification "m";<drive>;<filename>. When used for input an error report will be generated if the filename given does not exist on the specified drive. When used for output the file specified will be overwritten if it already exists and will be created if it does not.

<channel spec.> represents any allowed channel specification. Input channel specifications are:

"K" - the keyboard (also outputs to the lower part of the screen),

<file spec.>|N - input from a file.

Output channel specifications are:

"S" - the top part of the screen,

"P" - the ZX printer,

"b" - output to the parallel printer (see Chapter 5),

<file spec.>OUT - output to a file.

Note that after using a channel other than the screen the commands INK and PAPER may not work. To avoid this problem include the command PRINT; before using INK or PAPER.

CAT <drive>

This command displays the catalogue of the disc in the specified drive.

Example **CAT 1** displays the catalogue of the disc in drive number 1.

CLOSE# <stream>

This command closes the specified stream and frees it for further use. In the case of disc files it is important to close a file when access is finished, particularly when writing a file. Closing a file writes any information still in the buffer to the disc file, failing to close a file will mean that information is lost and will also mean that the directory entry is not written correctly.

Note that you cannot close streams 0, 1, 2 or 3, attempting to close any of these streams resets them to their defaults.

CODE <start address>,<no. of bytes>

This is an extension to the LOAD and SAVE commands which allows a block of memory to be saved and loaded. When saving a block of memory the start address and number of bytes must be given. When loading, the number of bytes is optional, if it is omitted the file is loaded into memory starting at the address specified. This overwrites the memory until all of the file is loaded and may overwrite information that is needed. If you wish to load a file into a block of memory whose size is fixed this size should be given in the command. The file is then only loaded if enough room is available.

ERASE <file spec.>

This command erases the file specified. The filename is removed from the directory and the space on the disc occupied by the file made available for further use.

INKEY\$ #<stream>

This command reads one character from the specified stream.

INPUT #<stream>;<variable 1>;< variable2>;

This command inputs values from the specified stream into the variables given. For input from a file the variables in the variable list must be separated by semicolons and not commas. In the file the values to be read must be separated by the ENTER character and care must be taken to ensure that this is done when writing the file.

LOAD* <file spec.>

This command loads the programme named in the file specification. It can also be used to load a block of memory by using the CODE extension (see CODE).

LPRINT# <stream>;<variable 1>;< variable 2>;

This command prints the values of the variables in the variable list to the specified stream. It works in exactly the same way as the PRINT # command.

MOVE <file spec.>TO <file spec.> or MOVE <file spec.>TO "b"

This command transfers information from an input file to another file or to the parallel printer. The process continues until end of file occurs in the input channel and it can therefore only be used to transfer a complete file. This command can be used to backup data files e.g.

MOVE"m";1;"Telephone"TO "m";2;"Telephone1"

will copy the data file 'Telephone' on drive number 1 to a file 'Telephone1' on drive number 2. This command cannot be used to backup programme files, to do this use LOAD* and SAVE*.

It can also be used to print a data file using the parallel printer interface e.g.

MOVE"m";1;"Telephone"TO "b"

will print the contents of the data file 'Telephone' on drive number 1 on a parallel printer.

OPEN# <stream>;<channel spec.>

This command associates the specified stream with the channel given.

PRINT #<stream>;<variable 1>;< variable 2>;

This command prints the values in the variable list to the specified stream. The items in the variable list can be separated by any of the separators used with the PRINT command. When writing to a file which is to be read using another programme the items in the file must be separated by an ENTER character and they must therefore be printed separately or separated by apostrophes in the print list.

Printing to different streams can be carried out from the same print statement e.g.

PRINT #5;"SPECTRUM";#8;"disc ""#2:"system"

will send 'SPECTRUM' to stream 5, 'disc ENTER' to stream 8 and 'system' to the screen (stream 2).

SAVE* <file spec.>

This command saves the current programme to the filename given in the file specification. It can also be used to save a block of memory by using the CODE extension (see CODE).

The utility programme provided on the system disc has three options:

1. Format a disc
2. Backup a disc
3. Compact a disc

Each option prompts for any necessary input and is described elsewhere.

The Printer Interface

The OPUS disc system has a parallel printer interface included. To use with a parallel printer you will need a printer cable. These can be obtained from Opus Supplies, please write giving details of the printer that you wish to use. Alternatively you may wish to make up your own cable and to help you do this the pin connections for the edge connector are given below.

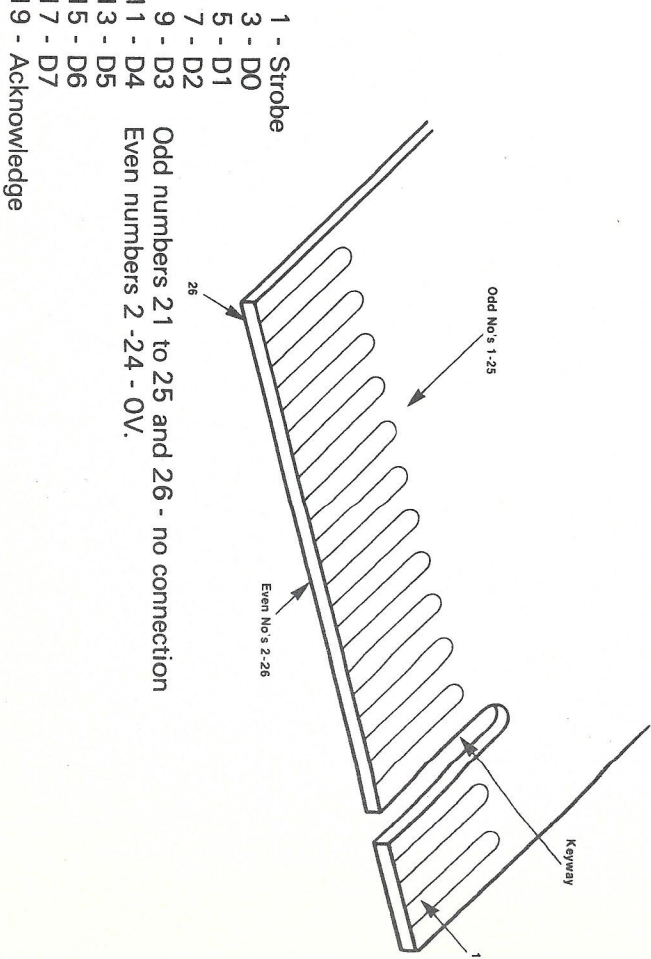
Having connected the printer to the interface output can be sent to the printer by opening a channel to the printer interface. The channel specifier for the printer interface is "b" and so the command

OPEN#9,"b"

will set up stream 9 to send output to the printer.

If you have a programme which uses LPRINT to send output to the ZX printer this can be redirected by using stream 3 as the printer channel. LPRINT automatically uses stream 3 for it's output (this stream defaults to the ZX printer).

The edge connector on the interface is a standard 26 pin IDC connector and the pin connections are:



Appendix 1

The OPUS disc system is supplied with two types of disc drive; 5¼" floppy disc drives or 3" microdrives. This section is therefore divided into three parts:

1. General rules for the care of discs
2. Information for 5¼" disc users
3. Information for 3" disc users

General Rules for the Care of Discs

Do not touch exposed surfaces

Keep away from magnetic fields generated by monitors, televisions, tape recorders, loudspeakers, etc.

Avoid dust, cigarette smoke and ash, and liquids. If the surface becomes contaminated do not use the disc as the contaminant will be transferred to the disc drive head and may then contaminate other discs.

Keep away from extremes of temperature. If this cannot be avoided then leave the disc at room temperature for at least thirty minutes before using it. One particular place to avoid is the rear parcel shelf of a car which can become very hot.

Information for 5¼" Disc Users

These discs are not so robust and so the following extra rules apply:

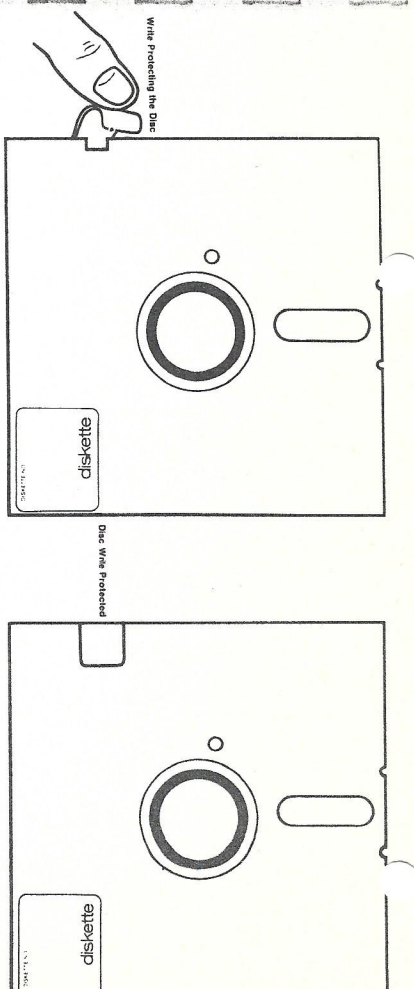
Do not bend or crush

Use a felt tipped pen to write on the label and press lightly. Better still write the label before sticking it onto the disc.

Keep the discs in their sleeves when not in use and do not drop.

Write protection

5¼" disc have a write protect notch in one side. To write protect the disc this notch should be covered by a 'write protect sticker'. These are usually included when purchasing a box of discs.



Which Discs to Use

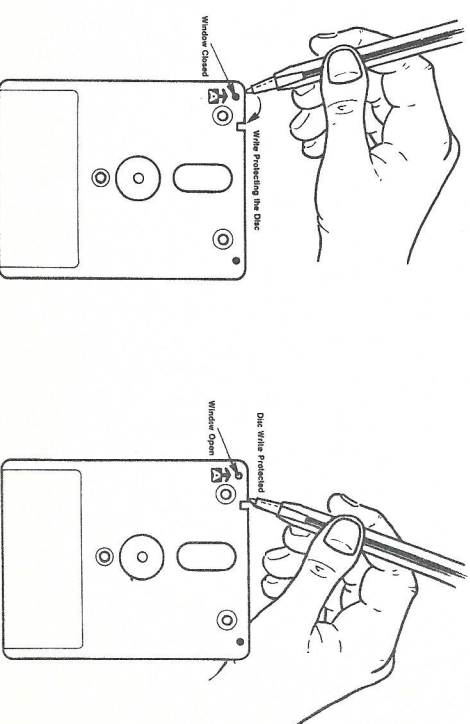
The SPECTRUM disc interface works as a 'double density' system and the discs must be classified as suitable for 'double density' use. In addition there are several types of 5¼" drives and it is important that you use the correct type of discs. For a single sided disc drive the discs should be classified as 'single sided, double density', while for double sided drives they should be 'double sided, double density'.

Information for 3" Disc Users

The 3" disc drives supplied with the OPUS disc system are double sided. The disc can only be inserted completely with the A1 upwards.

Write Protection

The disc is protected using the write protect slide for side A. With the double sided drives the write protect slide for side B has no effect. The disc is write protected when the slide is moved back to reveal the hole.



Appendix 2

Error Reports

Code error- the file specified is larger than the space allocated (given as the number of bytes in the CODE instruction).

Disc full - there is insufficient space on the disc. Try compacting the disc.

Drive write protected- the disc in the specified drive is write protected.

File not found - the filename given has not been found on the disc in the specified drive.

Invalid device type - the device type is incorrect. Allowed device types are b,i,k,m,o,p and s (upper case letters are also allowed).

Invalid drive number - the drive number given is incorrect. Allowed drive numbers are 1 or 2.

Invalid stream number - the stream is not open or the stream number is incorrect. Allowed stream numbers are 0 to 15.

I/O error - this error occurs when there is a problem reading from or writing to the disc. Possibilities are: disc not in the drive, specified drive not connected or corrupted information on the disc.

Missing drive number - the drive number has been omitted from the file specification.

Missing filename - the filename has been omitted from the file specification.

Reading a write file - the stream being used for input has been opened for output.

Stream already open - the stream specified is already in use. Writing a read file - the stream being used for output has been opened for input.

Wrong file type - the file specified in the LOAD* command is a data file.

Appendix 3

Manual Updates

Any updates to the manual pertaining to your version of the disc system are included on the utility disc in a file called 'READ ME'. To display this file insert the disc into drive number one and type:

**LOAD "m";1;"READ ME"
RUN**

Appendix 4

Guarantee

This equipment is guaranteed only against defects in design, materials and workmanship, from the date of purchase for the relevant period and subject to the conditions below.

Registration

The guarantee shall only be effective if the whole Guarantee Card is completed and mailed within ten days of delivery to Opus Supplies Ltd, 158 Camberwell Road, London SE5.

Period of Guarantee

The Guarantee is effective for six months calculated from the date of purchase.

Conditions

1. This Guarantee is personal to the original user, is not transferrable and shall not be valid unless the equipment was purchased or taken on deferred or hire purchase terms from an appointed Opus Dealer, to whom the equipment was sold by the Company or direct from the Company.
2. This Guarantee will be invalidated if the equipment is misused or modified in any way without the written consent of the Company or if any original component or accessory has been replaced by any component or accessory of a type not recommended or approved by the Company, or if operated other than in accordance with the Instruction Manual.

3. Any claims made under this Guarantee must whenever possible be made through the Dealer from whom the equipment was originally purchased, or taken on deferred or hire purchase terms. If this is not possible a claim may be made to any other Opus Dealer (a list of whom can be supplied on application). The customer's portion of the certified guarantee must be produced when any claim is made. The cost of carriage to and from the Dealer must be paid by the customer.
4. The Company's own transport will collect and return at no charge from an Opus Dealer only any equipment which after agreement by the Company is found necessary to be forwarded to them for repair.
5. In the event of equipment being being returned which on test is found to comply with the published specification, the Company reserves the right to charge a reasonable fee for testing the equipment and for return carriage.
6. The liability of the Company under this Guarantee shall be limited to the cost of repair or complete replacement (at the discretion of the Company) of the defective equipment.
7. The Company does not accept responsibility for any loss or damage during transit to or from the Dealer or the Company, but every effort will be made to investigate complaints of loss or damage if these arise.
8. This Guarantee does not affect the purchaser's statutory rights.

Guarantee Registration

Customer's copy

Model/Invoice/Ref.No.

Date of Purchase

Dealer

Address

Guarantee Registration

Opus Supplies Ltd. copy

Model/Invoice/Ref.No.

Date of Purchase

Dealer

Address

I accept the terms of this guarantee.

Customer's signature

This Guarantee is only valid if it is completed and signed above by the cus mailed to Opus Supplies Ltd, 158 Camberwell Road, London SE5 within ten days of delivery to the original user.

This Guarantee is valid in the U.K. only.

Appendix 5

Addresses

For placing orders and sales information contact:

Opus Supplies Ltd.,
158 Camberwell Road,
London SE5.

For technical enquiries contact:

Opus Research Ltd.,
St Annes House,
St Annes Technology Park,
Bristol,
BS4 4AB.

For information of updates to the software contact:

Opus Research Ltd.,
St Annes House,
St Annes Technology Park,
Bristol,
BS4 4AB.

Programme per restore

(30208) 7600 CALL 7530

LD A, 0BH

CPL

LD (3800), A

JP 700

~~LD A, 00H~~

(30000) 7530

CALL 1708H

LD A, (PC+0)

AND 0FH

LD B, FFH

RST 3FH

LD C, E5

POP IX

LD A, (IX+02)

AND 0F

LD B, A

LD A, (7E00)

AND 10

OR D

LD (3000), A

LD A, (IX+03)

CPL

LD (3802), A

RET