



Datafax Systems Spectrum Interface

USER MANUAL

For the Sinclair ZX Spectrum



Dealer

(c)October 1984 Datafax Systems Limited, Technical Dept.

Written by Colin Miller and Mark Smith

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Datafax Systems Limited  
Datafax House  
Bounty Road  
Basingstoke  
Hampshire  
RG21 3BZ

Fourth edition

#### Customer Feedback

If you have any ideas for improvements for the Datafax Interface or this manual, or have found useful commands or utilities to run on the Interface, please write and let us know. Datafax Systems welcomes your comments and ideas as it helps us produce better products for you. Please send your letters to Colin Miller at the above address.

ZX Spectrum (c) Sinclair Research

## Section 1 : General Programming

### To begin with.....

Thank you for buying the Datafax Interface. You have made a wise decision and we hope that you will have many years of trouble free service from it. This manual will help you use your Sinclair Spectrum, Datafax Interface and Hitachi 3" Disc drives to the full. Compared to a cassette player your programmes will load and save much faster. The Hitachi 3" Disc Drive can search from track to track in 3 thousandths of a second - covering the entire diskette in just over a tenth of a second. All of your programmes should load within 2 seconds.

This manual will also tell you how to connect the Datafax Interface onto the Spectrum so that you can run the drives. It will also explain what all the plugs and buttons on the Interface do. It will also tell you how you can format discs so that the Spectrum can read and write information onto them. Once formatted you can save Spectrum programmes on it. It can not be used on any other type of computer as each has its own way of formatting discs. If you run the Format option (F) on the Utility programme remember that it is only formatting one side of the diskette. Once it is formatted turn the diskette over so that you can run the format routine on the other side.

Finally, there should be the Utility Diskette, mentioned above, with your Datafax Interface. With it you will also find fifteen free colour games. Although it will not do anything more than you can do by using two Datafax Interface commands or by reading this manual, it may still help you to get started on your disc drives. To use it put it in the disc drive with the A side facing upwards and type in :

```
LET f$="Utils" : PRINT USR bl
```

LET, PRINT and USR are all Sinclair Basic commands.

The programme will load and then the screen should say :

```
(c)1984 Datafax Systems Limited
```

```
ZX Spectrum
```

- A - Load in an array file
- B - Load in a Basic file
- C - Load in a code file
- D - Directory of diskette
- E - Erase a file
- F - Format a diskette
- G - Go on Backup routine
- H - Help

```
Enter Programme Letter (A-H) ?
```

If it does not come up with the above, check that the disc drive is switched on. If a number appears then check it against the codes in Appendix E. After choosing an option and pressing a letter the relevant Datafax Interface command will appear underneath the 'Enter Programme Letter' line to show you what you need to type in to do what you have chosen. The Spectrum will wait for you to press a key to continue the operation. Thus you are learning quickly and easily the fundamental syntax of the Datafax Interface.

A - Load in an array file will load in an array file that you name.

- B - Load in a Basic file will load in a Basic Programme that you name.
- C - Load in a code file will load in a code file that you name.
- D - Directory of diskette will show you the contents of the diskette - the programme will pause once it shows you the directory command to allow you to change diskette.
- E - Erase a file will delete a file you name from your diskette completely. Once done you cannot retrieve the programme. The programme will ask you to confirm your action before erasing the file.
- F - Format a diskette When you buy a new diskette for any computer it is completely blank, as well as being completely useless. This formatting command changes it into a diskette the Spectrum and Datafax Interface uses.
- G - Go on Backup routine will allow you to backup important diskettes for safe storage. DO THIS WITH YOUR UTILITY DISKETTE.
- H - Help will give information ( also in this manual ) concerning Interface Basic commands available to you.

Once the operation has been performed it will allow you to return to the Utility menu to do something else if you require by asking you :

Want to Quit the programme?(y/n)

If you want to return to the menu press 'N'. If you press 'Y' then the system will load in the games menu with Utilities as the first option.

If you just want to run the games then type in :

```
LET f$="Menu" : PRINT USR bl
```

to load in the games menu.

**\*\* Very important \*\***

- 1) Try not to leave diskettes in the drive either when switching on or switching off the disc drive. This may corrupt the diskette. However, you can press the reset button on top of the interface with a diskette in the drive without fear of diskette corruption.
- 2) The commands used by the Datafax Interface are stored in 8 kBytes of user memory. As soon as the commands NEW or RUN are used the memory location is cleared and the Spectrum acts as if there was no interface on it. To reboot in the disc operating system type in the following :

```
CLEAR : PRINT USR 64000
```

or put these commands in the first few lines of your programme. eg :

```
10 CLEAR : PRINT USR 64000
```

- 3) You have a special variable called F\$. If you can, leave this name out of

your normal programme variables, reserving it only to your disc commands. As you will see later this variable is used to name files and diskettes by other Datafax Interface commands.

- 4) In this User Manual you will find instructions which will relocate full 48k programmes from cassette so that they can be saved onto and loaded from diskette over the 8K Operating System.



Diagram 1 : The back of your ZX Spectrum

The Datafax Interface and Hitachi Disc Drive looks like this :



Diagram 2 : The Interface Parts

Disconnect your Spectrum from the mains, then connect the Spectrum edge connector to the Datafax Interface connector so that the Disc Drive toggle switch and the Reset button are facing upwards (as shown in diagram 2). Check that the Interface is securely fitted to the back of the ZX Spectrum before continuing. If you think it is not secure enough contact your dealer. You will see that there is a connection on the top of the Interface for you to put other equipment on. The Disc Drive toggle will switch operation from your ZX printer (say), to the Datafax Disc Interface. If your Spectrum does not seem to be communicating with the disc drive check that this toggle is on the right setting.

Plug in the Datafax Interface and then the Spectrum to mains. The following should now appear on the screen :

```
(c)1984 DATAFAX SYSTEMS LIMITED
DATAFAX SPECTRUM DISK INTERFACE
```

If not, press the reset button at the back of the Interface box. The centre of the screen will go black and then clear with the above comment appearing at the bottom. If it still fails to appear then consult your dealer.

## Connecting the Datafax Interface onto the Spectrum

Looking at the back of the Spectrum you have the following connections :

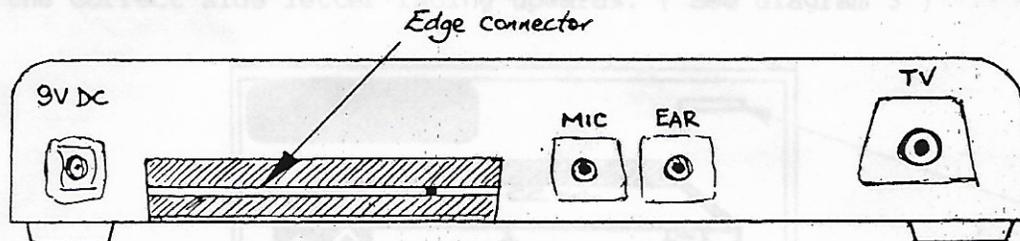


Diagram 1 : The back of your ZX Spectrum

The Datafax Interface and Hitachi Disc Drive looks like this :

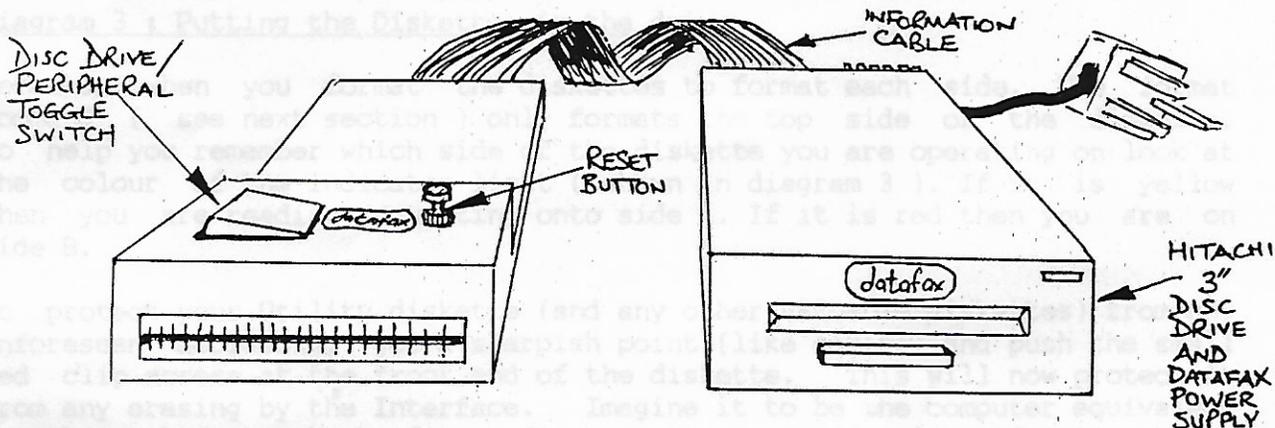


Diagram 2 : The Interface Parts

Disconnect your Spectrum from the mains, then connect the Spectrum edge connector to the Datafax Interface connector so that the Disc Drive toggle switch and the Reset button are facing upwards ( as shown in diagram 2 ). Check that the Interface is securely fitted to the back of the ZX Spectrum before continuing. If you think it is not secure enough contact your dealer. You will see that there is a connection on the top of the Interface for you to put other equipment on. The Disc Drive toggle will switch operation from your ZX printer (say), to the Datafax Disc Interface. If your Spectrum does not seem to be communicating with the disc drive check that this switch is on the right setting.

Plug in the Datafax Interface and then the Spectrum to mains. The following should now appear on the screen :

(c)1984 DATAFAX SYSTEMS LIMITED  
DATAFAX SPECTRUM DISK INTERFACE

If not, press the reset button at the back of the Interface box. The centre of the screen will go black and then clear with the above comment appearing at the bottom. If it still fails to appear then consult your dealer.

## Your Hitachi Disc Drives

Your ZX Spectrum talks to the top side of your Hitachi Disc Drives so when you put your 3" diskettes into the drive check that the edge of the diskette has the correct side letter facing upwards. ( See diagram 3 )

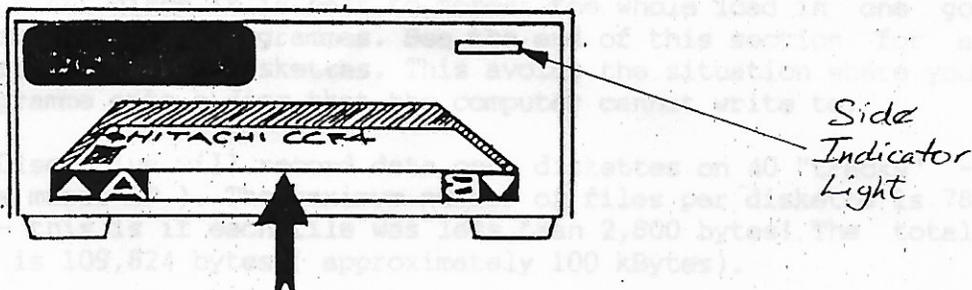


Diagram 3 : Putting the Diskettes in the drive

Remember when you format the diskettes to format each side. The format command ( see next section ) only formats the top side of the diskette. To help you remember which side of the diskette you are operating on look at the colour of the indicator light ( shown in diagram 3 ). If it is yellow then you are reading or writing onto side A. If it is red then you are on side B.

To protect your Utility diskette (and any other valuable diskettes) from any unforeseen accidents, get a sharpish point (like a biro) and push the small red clip across at the front end of the diskette. This will now protect it from any erasing by the Interface. Imagine it to be the computer equivalent to the tab on the back of an audio cassette to avoid unintentional rubbing out and recording on that tape. However, unlike the tab on the audio cassette the write-protect can be cancelled by pushing the red tab back so that the small hole in the diagram below is filled in. This will allow you to save or delete programmes on the diskette.

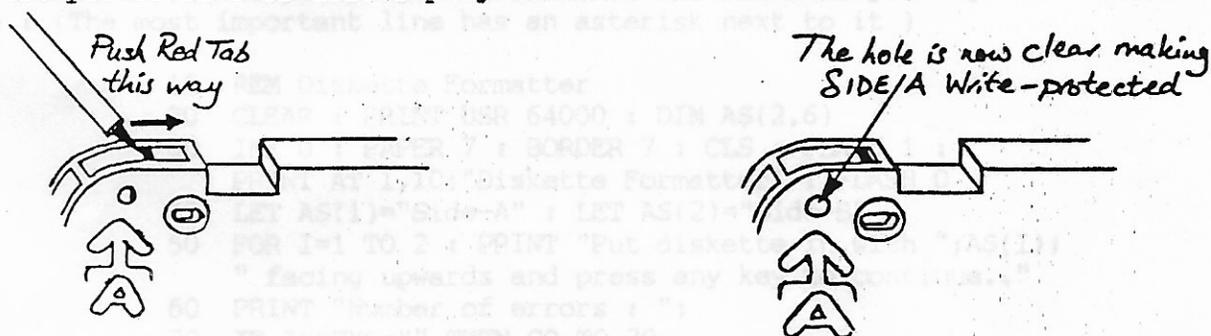


Diagram 4 : Write Protecting Diskettes

Formatting Diskettes

```
f$="diskette name"
PRINT USR nd
```

As explained briefly in the section "To begin with..." your diskette has to be of a format that the Sinclair Spectrum can understand. When you buy your first batch of blank discs it is best to format the whole load in one go before using them with your programmes. See the end of this section for a programme to format a batch of diskettes. This avoids the situation where you try to save a programme onto a disc that the computer cannot write to.

Your Hitachi 3" Disc Drive will record data onto diskettes on 40 "tracks" - ( very much like a music LP ). The maximum number of files per diskette is 78 ( 39 per side ) - this is if each file was less than 2,800 bytes! The total capacity per side is 109,824 bytes ( approximately 100 kBytes).

To begin formatting you want to give the diskette a "title" - to give some information on what subject the files on the diskette covers. This can be a maximum of six letters. For example :

```
LET f$="Games"
LET f$="Maths"
LET f$="Utils"
```

When you ask for a directory of what is on the diskette your title will appear at the top. The title can only be set while formatting the diskette. ( To get a directory of the diskette see "Your friendly Operating System" )

The next stage is to actually lay out the diskette in the format useable by the Datafax Interface and your Spectrum.

To do this the command is :

```
PRINT USR nd (ie New Diskette)
```

To summarise, a simple programme to format a disc that you might use could be : (The most important line has an asterisk next to it )

```
10 REM Diskette Formatter
20 CLEAR : PRINT USR 64000 : DIM A$(2,6)
30 INK 0 : PAPER 7 : BORDER 7 : CLS : FLASH 1 :
  PRINT AT 1,10;"Diskette Formatter" : FLASH 0
40 LET A$(1)="Side-A" : LET A$(2)="Side-B"
50 FOR I=1 TO 2 : PRINT "Put diskette in with ";A$(I);
  " facing upwards and press any key to continue.."
60 PRINT "Number of errors : ";
70 IF INKEY$="" THEN GO TO 70
* 80 LET f$=A$(I) : PRINT USR nd : PRINT : NEXT I
90 PRINT "Do you want to continue formatting another ? (Y/N) "
100 IF INKEY$="" THEN GO TO 100
110 IF INKEY$="Y" OR INKEY$="y" THEN GO TO 30 ELSE STOP
```

Making Backup Copies

PRINT USR back

This is one of the few Interface commands where F\$ is not used. However it is still a very important command as it could save valuable programmes and a lot of misery.

When you have a very valuable diskette ( like your Utility diskette ) it is important to make backup copies of it before you go on.

The command to use is :

PRINT USR back (ie BACKUP diskette)

and begin the backup routine with your valuable ( and hopefully write - protected ) diskette in the disc drive. Type in the above command and after a little activity from the drive the prompt

Destin.

will appear in the top left hand corner. The computer will then load a section of the diskette into RAM and ask for the diskette to be changed over. Put in the blank ( formatted ) diskette into the drive and the computer then saves the section it has in RAM. It will then ask for the original diskette to be put back in with the prompt :

Source

It will then continue to ask for the diskettes to be swapped over until the backup is complete. There are four swap overs in all ( i.e. "Destin." appears four times, "Source" three ) and then it will then re-boot the system. You will then need to press the reset button or type :

CLEAR : PRINT USR 64000

If you want to carry on using the Datafax Interface commands.

If you have any programme in memory when you start the backup routine then obviously it will be written over when the Interface loads sections of the diskette into RAM.

**\*\* Very important \*\***

If you have left a diskette in the disc drive by accident when you either switched the drive on or off only to find you have corrupted the programmes on it - do not despair! Do a backup copy of it onto another diskette ( or side ) and in most cases your programmes will be restored.

Calling your Programme names.

```
f$="filename"
```

```
PRINT USR      al      as
                bl      bs
                cl      cs
```

al - Array Load - will load an array file from a diskette into memory. Check it is on the diskette first by using the directory command. F\$ takes the form :

```
"filename , member , list of numeric ,(and) list of string"
      number      array name      (/or)      array name
```

for example:

```
LET f$="data,10,B$,A"
PRINT USR al
```

where the filename is no more than 6 characters.  
the range of member numbers are 1-39 (one per track)

Read Chapter 24 of your Sinclair manual for more details about the various rules governing arrays in the Spectrum. These rules apply to arrays saved through the Datafax Interface as well. For a practical example list Fax-Base.

See DIR, "Your friendly Operating System"

as - Array Save - will save an array that is in RAM onto a diskette. F\$ takes the same form as for Array Load ( above ), ie :

```
"filename , member , list of numeric ,(and) list of string"
      number      array name      (/or)      array name
```

for example:

```
LET f$="data,10,B$,A"
PRINT USR as
```

bl - Basic Load - will load in a programme from diskette. You can also specify the line number you want the programme to start running from for automatic execution once loaded. Again, check it exists first using DIR. F\$ takes the form :

```
"filename"
```

for example:

```
LET f$="game1,10"
PRINT USR bl
```

User defined graphics are also automatically loaded with the Basic Load command so you do not need two files as you would with a cassette load.

See DIR, "Your friendly Operating System"

bs - Basic Save - will save a programme in RAM onto diskette along with any variables and user-defined graphics currently in RAM. Check that the name does not already exist on the diskette by using the DIR command. Like cassette programmes you can define automatic execution on load by specifying F\$ accordingly. ie :

"filename , start line number"  
(optional)

for example:

```
PRINT LET f$="games3,10"
PRINT USR bs
```

See DIR, "Your friendly Operating System"

cl - Code Load - will load in a binary code file from diskette. You can also specify the autorun address for automatic execution. F\$ takes the form :

"filename , start addr. , length ( bytes ) , autorun addr."

whereas the start address and the length can be left out, the autorun address must at least be set to zero. ALL commas must be included. eg :

```
LET f$="code1,50000,128,50020"
LET f$="code2,,,0"
```

then the command :

```
PRINT USR cl
```

cs - Code Save - will save a binary code file in RAM onto a diskette. The format of F\$ is the same as for Code Load ( above ). ie :

"filename , start addr. , length ( bytes ) , autorun addr."  
 <-----compulsory-----> (optional)

for example:

```
LET f$="code1,50000,128,50020"
PRINT USR cs
```

Your Friendly Operating System

```
PRINT USR dir
PRINT USR 64000
```

It would be quite useful sometimes to see what is on any given diskette. Either you will be meticulous and write on each diskette label and index sheet what programmes you have on it and keep a card index system, or your diskettes will pile up in an unlabelled, unorganised heap. In the Datafax Interface commands there is a way of telling what you have saved on the diskette. Put a diskette with something on it into the drive and type the following :

```
PRINT USR dir ( ie DIRectory )
```

What you should see is something like this :

```

DISK : Games
      ↗
(your diskette name)

Free : 25
      ↖
      (no. of tracks unused)

BASIC Bombs 03  ARRAY Data 02
BASIC Gamel 04  CODE Eater 08
CODE Gamel 03  0

↑           ↙           ↘
(File)     (Name)     (no. of tracks)
(Type)                    (used by file)

```

The zero appearing at the end of the list tells you that the reading of the diskette has happened with no errors occurring. ( See Appendix D:Error codes ) From this information you will then know whether there is room on the diskette for more files, a file you've been looking for, a file you want to erase or whether a filename you want to use is already in use. Bear in mind that you can have an array, basic and code file all with the same name on one diskette - the Datafax Interface is clever enough to cope with this!

Also it is sometimes important to reset the system variables in the software. To do this type in :

```
CLEAR : PRINT USR 64000 ( the reason it's a number is
                        because all system variables
                        are lost after a RUN command )
```

This will allow you to use Datafax Interface commands within your programme and after you have finished with your programme. ALWAYS use this command after using RUN or NEW to restore the system variables, or put it in the early part of your own programme.

Killing Files

```

Trapping the error
LET f$="filename.type code"
PRINT USR zap

```

To kill a file we have the command ZAP. Once killed the file cannot be brought back to life so exercise your power with care! As we saw in the last section you can have three types of files. As well as that they can all have the same name. To clarify exactly which file you want to rub out we have to define what type of file it is as well as its name. In this way you don't erase the wrong file even if it has the same name as the one you want erased. The type codes required are very simple :

a - Array file

b - Basic file

c - Code file

So to erase a Basic programme called "Game1" you would type :

```

LET f$="Game1.b"
PRINT USR zap

```

A zero should appear to say that Games1 is no more. If there is another number then refer to Appendix D:Disc Error Codes.

A simple killing files programme could be : ( The most important line has an asterisk next to it )

```

10 REM File Killer
20 CLEAR : PRINT USR 64000
30 INK 0 : PAPER 7 : BORDER 7 : CLS : FLASH 1 :
  PRINT AT 1,10;"File Killer" : FLASH 0
40 PRINT ,, "What type of file is it : "
50 PRINT ,, "A", "Array", ,, "B", "Basic", ,, "C", "Code"
60 IF INKEY$="" THEN GO TO 60
70 LET B$="."+INKEY$
80 PRINT £0;"Enter file name : ";
90 INPUT A$ : IF LEN(A$)>6 THEN PRINT "File name too long (
  Max:6 ) : GO TO 80
* 100 LET f$=A$+B$ : PRINT USR zap
110 PRINT "Do you want to kill another ? (Y/N)"
120 IF INKEY$="" THEN GO TO 120
130 IF INKEY$="Y" OR INKEY$="y" THEN GO TO 30 ELSE STOP

```

## Section 2 : Advanced Programming

### Trapping those Errors

Now you are familiar with the Datafax Interface, you will probably want to perform more sophisticated operations on your disc drive. If you are writing programmes that will be used by other people ( who may not know very much about computers ) then this chapter will be very important. "Error Trapping" is a phrase often used by computer programmers. In short it means that the software is able to trap certain errors that the user may try to do and print an error message on the screen instead of messing your wonderful programme. You may have noticed that a number appears at the end of a disc operation. If you are really clever then it's always zero - meaning no errors occurring during the disc operation. This constant appearance of the number may have irritated you, or you may have wondered how you could use that number. What now follows is an example of how you can use it :

Suppose we were to modify the programme in the chapter "Killing Files" to include some error trapping, the modifications could be :

```

100 LET f$=A$+B$ : LET error = USR zap
105 IF error <> 0 THEN GO SUB 140
140 BEEP 1,30 : PRINT "* Error - ";
150 IF error = 3 THEN PRINT "Track 0 faulty, cannot modify disc *"
160 IF error = 4 THEN PRINT "Diskette write-protected *"
170 IF error = 5 THEN PRINT "Diskette corrupted *"
180 IF error = 7 THEN PRINT "Filename used is wrong format *"
190 IF error = 10 THEN PRINT "File not found on diskette *"
200 RETURN

```

As you can see the new important command is :

```
LET error = USR zap
```

The reason that this works ( for machine code hackers ) is because the error code is stored in the BC register pair and is allocated to the variable "error" by the LET statement. The LET command structure can be used with all the Interface commands.

## Forced Auto-runs and Beeps

Another useful facility on the Datafax Interface is auto-running of programmes. But suppose you save a programme without an Auto-run and wish to auto-run it later on. Rather than load it in, zap it from the diskette and then re-save it you could type in ( for example ) :

```
LET f$="Game1" : RUN USR bl
```

Or if you have saved the programme with some variables which would be lost on the command of RUN or NEW, then type in :

```
LET f$="Game1" : GO TO USR bl
```

Also on relatively long and drawn out processes, eg formatting of diskettes, you may want some indication of completion of the operation. Perhaps a BEEP command would serve the purpose. To do this try :

```
LET f$="DSL-1" : BEEP 1, USR nd
```

On completion of the operation you should have a beep in "C" to tell you you have completed the formatting. However if there was an error during formatting you would not know as the error variable is used in the BEEP command. Another alternative could be :

```
LET f$="DSL-1" : LET error = USR nd : BEEP 1,error
```

All these extended commands will not work on the BACK command, as it reboots the Spectrum on completion of the operation.

```
CLEAR ( start address of code minus one byte )
```

```
(If CLEAR address is not less than 32001 then CLEAR 32000)
```

```
PRINT USR 54000
```

```
LOAD "A" CODE
```

```
LET f$="A,x,y,0" : PRINT USR ca
```

```
LOAD "B" CODE 32001
```

```
LET f$="B,32001,2048,0" : PRINT USR ca
```

```
LOAD "C" CODE 32001
```

```
LET f$="C,32001,2048,0" : PRINT USR ca
```

## Saving and Loading 48K Programmes

One of the criticisms of our Datafax Interface is the memory overhead of 8K user RAM. However, for those who write massive blocks of machine code of more than 31K of memory there is a straight forward procedure to go through to save it onto diskette, and a simple BASIC code loader routine which is listed below. ( Remember also that the standard Sinclair Spectrum has only got 41K of user memory free ).

Firstly, we must take the machine code programme and cut it into 4 sections, for this example we shall name them "A", "B", "C" and "D". "A" will be the bulk of the machine code and will load in to it's proper position. Part "D" will go onto screen memory and relocate during the BASIC loader. Finally, part "B" and "C" will be loaded into their correct memory position. To start the transfer type in :

```
RANDOMIZE USR 0
```

This really wipes out the memory and erases the Interface commands. Next, load in your machine code programme. Do not run the programme but instead type in the following save statements to save it onto tape :

```
CLEAR < start address of code minus one byte >
```

```
SAVE "A" CODE x,y      where x = start address
                        and y = 55296 - ( start address )
```

```
SAVE "B" CODE 55296,2048
```

```
SAVE "C" CODE 57344,2048
```

```
SAVE "D" CODE 59392,6144
```

You now have four sections of code on tape. Press the Reset button on the Interface to boot in the Interface commands. Then type in the following statements to save onto diskette :

```
CLEAR < start address of code minus one byte >
```

```
(If CLEAR ADDRESS is not less than 32001 then CLEAR 32000)
```

```
PRINT USR 64000
```

```
LOAD "A" CODE
```

```
LET f$="A,x,y,0" : PRINT USR cs
```

```
LOAD "B" CODE 32001
```

```
LET f$="B,32001,2048,0" : PRINT USR cs
```

```
LOAD "C" CODE 32001
```

```
LET f$="C,32001,2048,0" : PRINT USR cs
```

LOAD "D" CODE 32001

LET f\$="D,32001,6144,0": PRINT USR cs

Check with a DIR command to see that all the sections are now on diskette and then press the Reset button once more. Type in the following BASIC loader programme :

48K Code Loader

Written by : Mark Smith

(c)1984 Datafax Systems Limited

```

1 CLEAR < start address of code minus one byte > :
  PRINT USR 64000
2 FOR n = 23296 TO 23307 : READ a : POKE n,a : NEXT n :
  DATA 1,0,24,33,0,64,17,0,232,237,176,201
3 LET f$ = "A,,0" : RANDOMIZE USR cl
4 LET f$ = "D,16384,6144,0" : RANDOMIZE USR cl
5 LET f$ = "B,55296,2048,0" : RANDOMIZE USR cl
6 LET f$ = "C,57344,2048,0" : RANDOMIZE USR cl
7 RANDOMIZE USR 23296 : RANDOMIZE USR < start address >

```

Say your code ran a game called "Cats" then you could type in the following line :

LET f\$="Cats,1" : LET e = USR bs

You now have your 48K programme on diskette. It should now take about ten to fifteen seconds to run full 48K programmes. For BASIC programmes which you find won't save because they are too long, save them as if they were machine code. The start address for this would be 23552. If you have Machine code programmes with large amounts of BASIC at the start include our BASIC loader as lines 1 to 7 of your programme. When using this BASIC loader you will notice dot patterns appearing on the screen. To mask this effect include on line 3 of the loader PAPER and INK commands to set both colours to the same value.

For those who are more familiar with Z80A machine code, the full listing of the relocater code is as follows :

	ADDRESS		MNEMONICS	Decimal Code
ORG	5B00	Hex	LD BC,1800 Hex	1, 0, 24
	5B03	Hex	LD HL,4000 Hex	33, 0, 64
	5B06	Hex	LD DE,E800 Hex	17, 0, 232
	5B09	Hex	ED	237
	5B0A	Hex	LDIR	176
	5B0B	Hex	RET	201

## Saving Screen Display onto Diskette

If you look at Appendix D ( the memory map of the Sinclair Spectrum ) you will see that the screen display starts at 16384 and goes on to 22527. This is followed by the attributes which defines the various colours on the screen. This area of memory starts at 22528 and goes on to 23295. To save the screen display you will thus need to save from 16384 to 23295. Say we had a screen of circles, we could save it as an area of code called "Circle" by the following command :

```
LET f$ = "Circle,16384,6912,0" : PRINT USR cs
```

When loading back into memory from diskette use the following command :

```
LET f$ = "Circle,,,0" : RANDOMIZE USR cl
```

RANDOMIZE is used instead of PRINT so that the error report is suppressed. The final zero in the f\$ specification MUST be included. This prevents the screen display from auto-running and thus resetting the Spectrum.



Diagram 5 : Disc Drive edge connector

Push the IDC connector into the edge connector, checking that the pins on the plug and the connector match and that the red marker line of the ribbon cable is to the right (i.e. to Pin 1).

The top of the disc drive should be a special Hitachi Disc Drive sticker with the drive serial number and :

HFD3058

There are two DIP switches which appear below the edge connector as you look down at it (shown above) and look like this:-



Diagram 6 : Single sided DIP switches

For the Datafax Interface check that the DIP switches are set as shown in diagram 6 inside the disc drive.

i.e.

Switch 1 : switch 1 on the rest off.

Switch 2 : All switches on.

Position the Datafax interface so that the edge connector is facing you, the reset button is facing upwards and the ribbon cable is coming out from the back. The ribbon cable connecting the Datafax Interface should have line 1 (marked with a red line) to the right as you look down on the interface.

Appendix A: Disc Drive Connections and DIP Switch Settings

**\*\* Warning! \*\***

If you have little or no experience with modern electronics then under no circumstances should you open the Datafax Disc Drive. As well as the Drive mechanism there is also a mains power supply which is potentially lethal. If you are in any doubts please consult your dealer.

The edge connector of the uncased Hitachi 3" Disc drive for the IDC connector should look like this as you look down on it from above:-

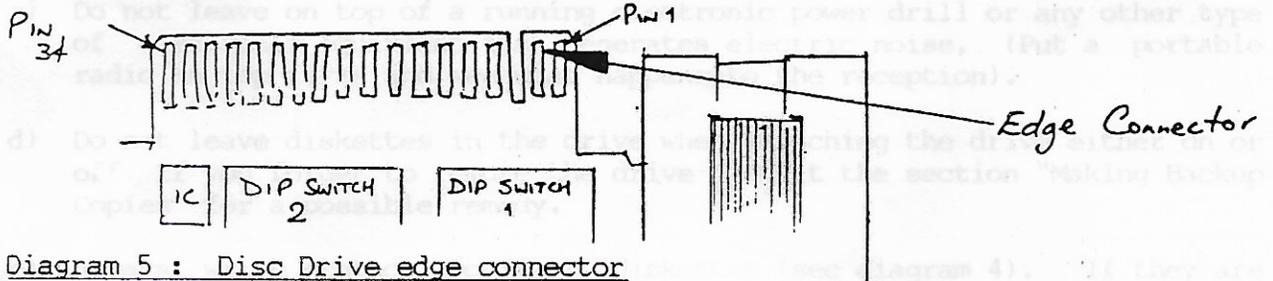


Diagram 5 : Disc Drive edge connector

Push the IDC connector onto the edge connector, checking that the numbering on the plug and the connector match and that the red marker line on the ribbon cable is to the right (i.e. to Pin 1).

On the back of the disc drive should be a special Hitachi Disc Drive sticker with the drive serial number and :

HFD305S

There are two DIP switches which appear below the edge connector as you look down at it (shown above) and look like this:-

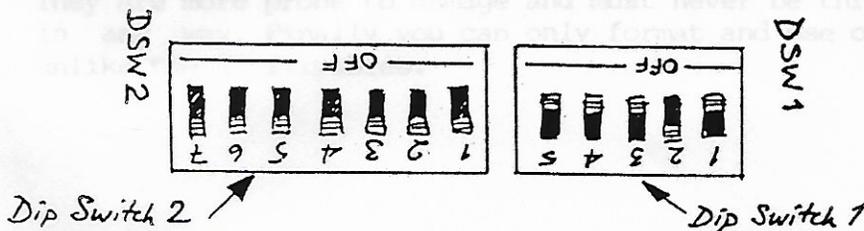


Diagram 6 : Single sided DIP switches

For the Datafax Interface check that the DIP switches are set as shown in diagram 6 inside the disc drive.  
i.e.

- DSW1 : switch 2 on the rest off.
- DSW2 : All switches on.

Position the Datafax Interface so that the edge connector is facing you, the reset button is facing upwards and the ribbon cable is coming out from the back. The ribbon cable connecting the Datafax Interface should have line 1 (marked with a red line) to the right as you look down on the Interface.

Appendix B: Diskette Care and Codes

You can consider the 3" diskette to be a miniature version of your favourite record, on much thinner plastic and cased in a hard shell. Therefore there are a few precautions you must take:-

- a) Do not fling diskette across the room repetitively over a long period of time as it affects the spring mechanism in it.
- b) Do not stir soup with it, leave on top of a radiator, or any similar types of situations.
- c) Do not leave on top of a running electronic power drill or any other type of electronic equipment that generates electric noise. (Put a portable radio on top first and see what happens to the reception).
- d) Do not leave diskettes in the drive when switching the drive either on or off. If you forget to remove the drive consult the section "Making Backup Copies" for a possible remedy.
- e) Always write protect important diskettes (see diagram 4). If they are very valuable make backup copies (see section "Making Backup Copies").
- f) Do not pull back the protective metal shield and touch, or allow dust to settle on the magnetised surface. This will corrupt the files on the diskette.
- g) **\*\* For purchasers of the Interface using a 5.25" drive \*\***

Details given in this manual on write protecting, and general handling of the discs is very different. To write protect the disc you will find a small rectangular notch along one side of the disc. If you cover this with a small label (usually supplied) you can write protect the disc. They are more prone to damage and must never be thrown around, or folded in any way. Finally you can only format and use one side of the disc unlike the 3" flipables.

Appendix C: Interface Command Codes

For people who write machine code programmes the codes for each command is given below. In a Basic programme environment the syntax would simply be :

```
LET F$="filename" : PRINT USR xxxxx
```

For example to load a Basic programme called "Game1" the command would be :

```
LET F$="Game1" : PRINT USR 64015
```

The full list of codes are :

<u>Command</u>	<u>Code</u>
DIR	64006
ZAP	64036
BACK	64033
ND	64003
AL	64027
AS	64024
BL	64015
BS	64012
CL	64021
CS	64018
Reset	64000

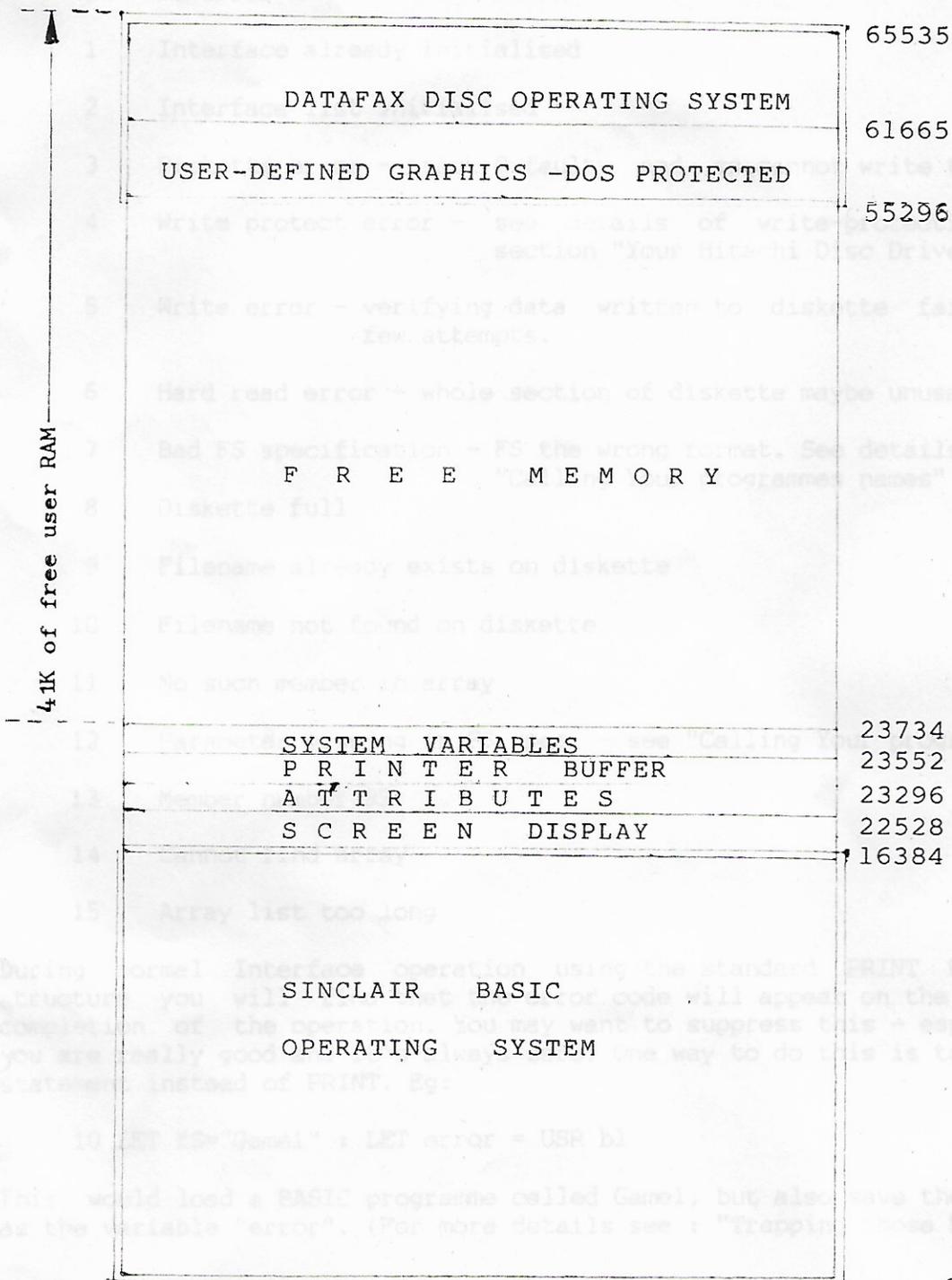
Appendix E: Disc Error Codes

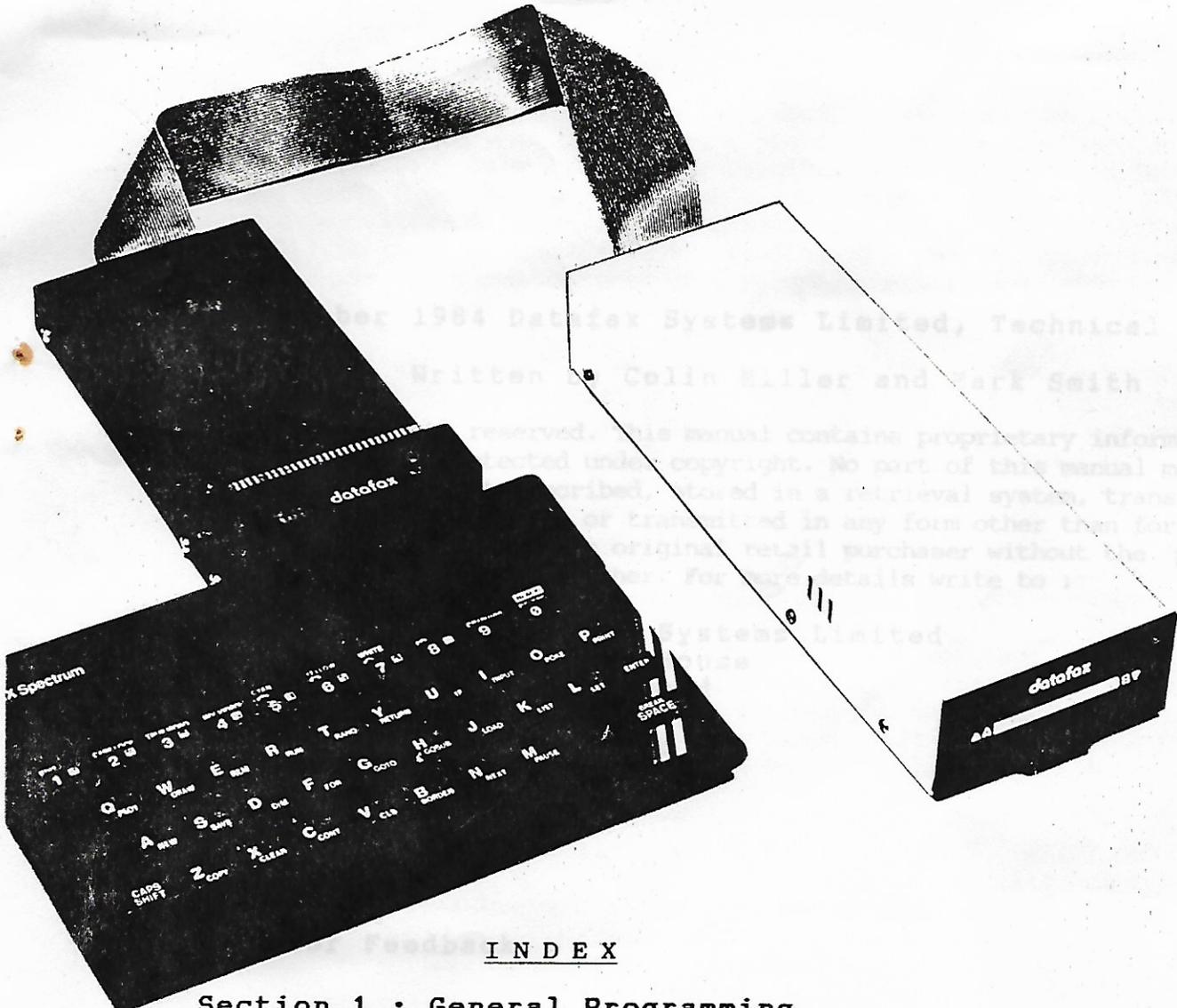
Dec	Diagnosis
0	No error
1	Interface already initialised
2	Interface list initialised
3	Diskette error - track 0 faulty and so cannot write to directory
4	Write protect error - see details of write-protecting in the section "Your Hitachi Disc Drives"
5	Write error - verifying data written to diskette failed after a few attempts.
6	Hard read error - whole section of diskette maybe unuseable.
7	Bad F\$ specification - F\$ the wrong format. See details in section "Calling Your programmes names"
8	Diskette full
9	Filename already exists on diskette
10	Filename not found on diskette
11	No such member in array
12	Parameter missing in F\$ spec. - see "Calling Your programmes names"
13	Member number 99
14	Cannot find array
15	Array list too long

During normal Interface operation using the standard PRINT USR command structure you will find that the error code will appear on the screen on completion of the operation. You may want to suppress this - especially if you are really good and it's always zero! One way to do this is to use a LET statement instead of PRINT. Eg:

```
10 LET f$="Game1" : LET error = USR b1
```

This would load a BASIC programme called Game1, but also save the error code as the variable "error". (For more details see : "Trapping those Errors")





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