LERM PLUS3MATE

CONTENTS

PLUS3MATE - INTRODUCTION.

Welcome to +3MATE. Please read through the manual carefully, although you will find, for most programs in this package of software, the instructions are simple and easy to follow. The following outlines the 5 programs contained on your +3MATE disc.

BOOT - this program copies to all of your own discs (DON'T copy it onto commercial discs). When you copy it saves itself as "DISK" and when used, it catalogues all the BASIC programs on your disc, and then, by simply pressing a letter, will load that program into memory. So it is a "LOADING" program, that saves you from doing a CAT of the disc, then trying to remember which files are BASIC, then having to enter manually, say LOAD "fred".

CLONE - this program will CLONE, or completely copy, one disc onto another. It will copy most protected discs, but you must not use it to break copyright laws. DO NOT GIVE AWAY SOFTWARE - it is theft and in the end of the day works against your own interests as software houses must make a profit - if they don't you will have very few programs available to you and will not be able to make the most of your PLUS3. CLONE will automatically detect a second disc drive.

BACKUP - this very valuable program makes it easy to erase or copy many files. It can even "unerase" files, telling you if this is likely to work or not. It will format discs, and verify/repair files, marking any physically damaged parts of the disc as not being available for use. It will automatically detect a second disc drive and save to it if present. This is only some of its features!

CAT - this will do a CAT of your disc, giving you information on each file (its type, length, position on the disc, etc). It can send the information to many printers.

EDITOR - for those who are interested, we have provided you with a means of editing directly any parts of the disc. This is useful for repairing files and modifying them without loading and resaving. It is for the more technically minded.

COPYING +3MATE FILES/MULTIFACE 3

In addition, you can backup most of the files on your +3MATE disc "just in case", but you can't copy it using our software. Incidentally, it has been secured against MULTIFACE +3, and we advise you NOT to attempt to use this interface. +3MATE is happy to have MULTIFACE +3 attached, but pressing the red button will cause it to crash, and you will have to hold in the reset button for a while to clear its memory.

GUARANTEE/UPDATES

If ON RECEIPT you are not completely satisfied with +3MATE then send the package back STRAIGHT AWAY. Please state the reason(s) for the return and mark your envelope "REFUND". Sorry we can't refund if you bought your package from a retailer or as an update. An SAE does speed up the process. Updates if available, are provided at a reduced charge - send off to us for details.

GENERAL GUARANTEE

This applies for 6 months. If your +3MATE fails you then send it back to us marked "FAULTY" (an SAE will help!), and we will replace it for you free of charge. After 6 months we will still replace it but make a handling charge of £2.

LERM, 11 BEACONSFIELD CLOSE, WHITLEY BAY, TYNE AND WEAR, NE25 9UW. TEL (091) 2533615.

LIST OF FILES ON YOUR +3MATE DISC

The following files are on +3MATE. Incidentally a "file" is a general name given to anything saved. So if you did the command SAVE "fred", what you are doing is saving a BASIC file. If you did SAVE "fred" CODE 30000,100 you have saved a CODE file. Doing SAVE "fred" DATA a() is saving a NUMERIC DATA file.

CODE FILES:

BACKUP1 and BACKUP2. CLONE1 and CLONE2.
CAT1 and CAT2. EDITOR1 and EDITOR2.
1 (yes file "1" - not an error!)

BASIC FILES:

DISK BOOT

WRITE PROTECT TAB

Throughout the manual and in the program, when we refer to the WRITE PROTECT TAB being ON we mean that you CAN'T write to the disc, as the hole is visible. When we refer to it being OFF, the hole is NOT visible, and you CAN write to the disc.

BACKING UP +3MATE

To make a back-up of the 11 files mentioned above you can
(a) use our BACKUP program or
(b) Use BASIC. Simply put your +3MATE disc into the drive, then enter

```
10 COPY "a:*.*" TO "b:"
```

Now type run and ENTER. When promted simply swop your +3MATE disc for the disc you are copying onto.

Keep your BACKUP in a safe place. Move the write protect tab so that you can't accidentally erase the backup files. If+3MATE fails to load in a program then replace the write protect tab off your +3MATE disc, then enter the command ERASE "*.*". After the "y/n" question, press "y" for yes. This will erase all 11 files from your +3MATE disc. Now simply copy all files back again using 10 COPY "a:*.*" TO "b:"
swopping between your backup disc and your +3MATE disc.

TECHNICAL INFORMATION A.

This is the simple introduction to your disc. We explain the meaning of TRACK, SECTOR, BLOCK, BYTE.

BYTE:

Your SPECTRUM has memory spaces just like pigeon holes. In any one of these pigeon holes or addresses, you can put in a number from the range 0 to 255. There are 65536 addresses available.

e.g	Address	What number is inside the address
	40000	23
	40001	125
	40002	201
	40003	23

The numbers that are inside the addresses are called BYTES. So in the above example, in address 40000 is BYTE 23. When you write some BASIC, what your SPECTRUM does is to place the appropriate BYTES into its memory area that represents the BASIC commands. So when you save some BASIC, the SPECTRUM saves a number of BYTES onto your disc depending upon the size of the program. If you saved so: SAVE "fred" CODE 40000, 100 then you save 100 BYTES starting at address 40000.

Your SPECTRUM +3 is called a 128k machine. The 128k means that it has a memory capacity of 128 x 1024 bytes. This is because 1k stands for 1024 bytes.

TRACK, SECTOR.

When you format a disc, what the SPECTRUM does is to split up your disc into sections. It chops it into 40 tracks, starting with TRACK 0 and ending at TRACK 39. Track 0 is on the outside, and track 39 is the last in the centre of the disc. See FIG.1. Each track, is simply a thin circle like a polo mint.

Each track is split up into 9 parts. These parts are called SECTORS, and are numbered from 0 to 8.

So TRACK 0 has sectors 0, 1, 2, 3, 4, 5, 6, 7, and 8.

TRACK 1 has sectors 0, 1, 2, 3, 4, 5, 6, 7, and 8, and so on.

Each sector can hold 512 bytes or 0.5k.

Therefore 1 track holds 9 x 0.5k = 4.5k. The whole disc holds 40 x 4.5k = 180k.

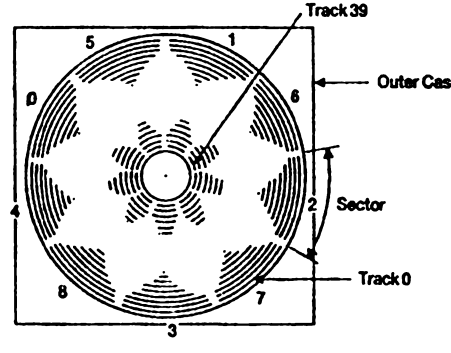

FIG.1

When you format a disc, the disc is marked off in the above mentioned way. The outer track is RESERVED. That means that the SPECTRUM does not save anything to it. Some other sectors are kept as a DIRECTORY. This directory is kept up to date with all the file names that are present on the disc, together with their location.

BLOCK

Two sectors together make a BLOCK, and is therefore 1k in size.
Track 0 has its 9 sectors, but none are used as blocks.
Track 1: Sectors 0 and 1 make BLOCK 0. (Block 0 reserved)
Track 1: Sectors 2 and 3 make BLOCK 1. (Block 1 reserved)
Track 1: Sectors 4 and 5 make BLOCK 2.
Track 1: Sectors 6 and 7 make BLOCK 3.
Track 1: Sector 8 plus Track 2: Sector 0 makes BLOCK 4. etc.

Track 39: Sectors 6 and 7 make BLOCK 174
The last, Track 39, sector 8, is not used for block allocation.

So what? Well when you save to your disc, this is done so by saving to BLOCKS.

e.g when you have just formatted a disc it states that 173k is free. This is because there are 173 BLOCKS (each of 1k) free, from BLOCK 2 to BLOCK 174. Blocks 0 and 1 are used for the DIRECTORY.
Suppose that you now saved a BASIC file called "fred", and it was just over 4k long. Your +3 would save "fred" to BLOCKS 2, 3, 4, 5, and 6. It will use 5 blocks as it is over 4k long. The name "fred" will be copied to the first directory block (number 0), but it will have, after its name, the numbers 2,3,4,5, and 6, so that the computer knows not only the file name, but to which blocks it was saved to. Even if you save just 10 bytes (e.g SAVE "test"CODE 20000, 10), then a whole block is used. This would be saved to BLOCK 7 as this is the next free block.

When you do the CAT command, the SPECTRUM simply counts how many BLOCKS are used.
e.g FRED 4k
TEST 1k
- shows that FRED uses 4 blocks, and TEST only one.

When you ERASE a file (e.g ERASE "FRED"), only the directory is changed. The blocks numbered 2,3,4,5, and 6 are marked as free, in the directory, but the data is NOT over-written. So it is possible to UNERASE files. When however you next SAVE a file to the disc, the SPECTRUM will notice that blocks 2,3,4,5, and 6 are free and write to these first, then making UNERASING impossible. If you were saving a file of say, length 9k, then it would be saved to blocks 2,3,4,5,6,8,9,10,11, missing out BLOCK 7 as this already has "TEST" on it. Our CAT program shows you, for any given file, which block numbers that file uses.

MANUAL FOR "BOOT" OR "DISK"

This program is called "DISK" as it copies to all of your own discs (NOT commercial ones), with the name "DISK". In this way, the copied program can be simply loaded by using the "Loader" command after re-setting the +3. It was saved onto your +3MATE with the name "BOOT", as we have already got another "DISK" program on the disc.

LOADING from your +3MATE

Reset you SPECTRUM. Place your +3mate disc into the drive.
Enter the +3 BASIC by pressing the cursor down key once and press ENTER.
Now TYPE the following LOAD "boot" and press ENTER, then wait.

The program will, after loading, auto-run and do a CAT of our +3MATE program, printing on the screen a list of all BASIC files it finds. In this case, as it is our program, it will come up with 2. They are BOOT and DISK. By simply pressing the letter next to the BASIC file you want to load in, the program will then load that file. Pressing BREAK causes a NEW to 48k BASIC.

If there are over 26 BASIC files to be displayed on the screen at once, then press key "1" to switch pages.

COPYING "DISK"
To copy "DISK" onto another disc simply press the number key "0", then put your new disc into the drive, then press any key. After saving the program will NEW itself to 48k BASIC.

SUMMARY
By copying our "DISK" program onto all of your discs you have a simple and easy way of doing a CAT of all the basic files on that disc, and loading in the one you want.

MANUAL FOR CLONE

This program will give a sector by sector copy of your original disc (called "source" disc) to another disc (called "destination" disc). It will even copy most protected discs.

If you have a single disc drive system, you will have to keep swopping over the source and destination discs when prompted to do so. The maximum number of swops is 3. If you have another disc drive attached, then copying is automatic from drive A to B

NOTE: THE SOURCE DISC MUST HAVE THE WRITE PROTECT TAB SET TO ON TO PREVENT IT ACCIDENTALLY BEING OVER-WRITTEN!!

LOADING IN CLONE
IF YOU HAVE 2 DRIVES, THEN REMOVE ANY DISC FROM DRIVE B. Reset your SPECTRUM. Place the +3MATE disc into the drive, and press ENTER (i.e use the "LOADER" option) and wait. Then press key number THREE and wait. Remove your +3MATE disc from the drive.

After loading LERM CLONE, you are told at the top of the screen which drive the copy will be saved to (A for single drive, B for those with 2 drives).

Simply follow the instructions you are given. You are told which tracks are being loaded, and saved, and when, for single drive owners, to swop discs. If you try to save to a disc which has its write protect tab on, you will be warned that saving can't take place.

After COPYING, if this was done without any swopping of discs, you are given the option of doing a REPEAT copy or not. In most cases however this is not possible as the SPECTRUM hasn't enough memory available to store the memory of a whole disc.

In any event you are given the option of
(a) NEW - going back to 48K BASIC.
(b) Going back to the start, ready to clone another disc.

NOTE: FOR THIS PROGRAM, AS WITH OTHERS IN OUR +3MATE PACKAGE, ENTERING BREAK WILL CAUSE THE SPECTRUM TO NEW ITSELF BACK TO 48K BASIC.

MANUAL FOR BACKUP.

LOADING IN BACKUP
IF YOU HAVE 2 DRIVES, REMOVE ANY DISC FROM DRIVE B. Reset your SPECTRUM. Place the +3MATE disc into the drive, and press ENTER (i.e use the "LOADER" option) and wait. Then press key number TWO and wait. Remove your +3MATE disc from the drive.

MAIN MENU
At this stage you can press "c", "v", or "f".

(A) "f" KEY - FORMAT disc in drive A.
To format a disc (Spectrum format), press key "f", and then place a blank disc into the drive. Press the "y" key to confirm you are sure, and formatting will begin. If the write protect tab is ON preventing formatting, or the disc is damaged in any part, then an error message "BAD DISC" will appear, showing you that formatting was incomplete.

(B) "v" KEY - VERIFY the disc and/or REPAIR files.
Put disc into your drive and then press "v". The disc will then be verified by loading in each sector, one at a time. A map of the BLOCKS will appear. At first all blocks will be red except blocks 0 and 1 which will be magenta. The magenta reminds you that these blocks are reserved. The red shows that the blocks haven't been tested yet.

The program then loads in both sectors associated with each block, and changes the colour to
(i) green if either sector is "bad" as it wasn't loaded correctly OR
(ii) cyan if both sectors are good.

The black blocks don't exist (numbers 175 to 179)

HOW TO READ THE BLOCK MAP:
Down the left and right hand side are the numbers 000, 020, 040, and so on down to 160. Across the screen are the numbers 0, 1, 2, and so on up to 19.

Start at the TOP LEFT - ROW 000, COLUMN 0. This square gives the status of BLOCK 0.

ROW 000 COLUMN 1 gives BLOCK 1, and so on.
ROW 000 COLUMN 19 gives BLOCK 19.
ROW 020 COLUMN 0 gives BLOCK 20.
ROW 020 COLUMN 1 GIVES BLOCK 21.

So to find the BLOCK NUMBER simply ADD the ROW and COLUMN NUMBERS. See next page for diagram.

If all the BLOCKS are GOOD, you are told so, and invited to press a key to return to the MAIN MENU. If one or more blocks are bad, the disc is automatically catalogued, and you can then press the "m" key to return to the MAIN MENU, or the "r" key to start a REPAIR.

BLOCK VERIFICATION MAP

```
    0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
000 a                                                 000
020                                                   020
040                                                   040
060           b                                       060
080                                                   080
100                                                   100
120                                                   120
140                          c                        140
160                                                   160
    0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
```

In the above example a=BLOCK 0, b=BLOCK 65, c=BLOCK 152.
If "r" is pressed the process is entirely automatic, but make sure that the write protect tab allows you to save to the disc. The BORDER will turn GREEN. What BACKUP does is to load in all BAD sectors (half a BLOCK - remember) and then resaves to them. If they are still bad, then the entire track containing that sector is loaded into memory, the track re-formatted, and then re-saved. Dummy bytes are placed into any part which can't be loaded in properly. It is almost certain that there will be corruption compared with your original, but it is better than nothing at all! Finally, if this still fails because of a physical problem on the disc that is impossible to overcome, the directory track is changed, and a file called CHR$ 0+ "LOCKED!" is created. This fools the SPECTRUM into thinking that the bad BLOCKS are already used and hence prevents you writing to them again. So you can erase the unloadable file with the knowledge that you can't re-save to the bad part of your disc. The REPAIR option can't do the impossible. It can make some files loadable again, but that is all. You may prefer to try to use the EDITOR program first to recover bad files.

(C) THE "c" KEY - does a CAT of your DISC.
This option allows you to COPY, ERASE, UNERASE files on your disc, as well as FORMAT a disc in drive A. Simply place your disc in drive A, then press the "c" key and wait.

When the CAT has taken place the screen is split into 2 halves. For each file you are told its
NAME (characters under 32 and over 128 are replaced by a "?")
TYPE - under the "T" column - B=BASIC, C=CODE, N=NUMERIC ARRAY
"$" = STRING ARRAY. "?"= UNKNOWN. "P"= PRINT FILES.
LENGTH - under the "k" column, its size in "k".

e.g

NAME		T	k
FRED	.bas	B	003
TEST	.cod	C	010

Near the bottom of the screen you are told the number of files on the disc, and how much memory is free in "k". You now have a choice of MODES.

MODES MENU

Key	Mode
c	COPY files
e	ERASE files
u	UNDELETE or UNERASE files
a	ANALYSIS
f	FORMAT disc in drive A
M	MAIN MENU (note capital M)

FORMAT - "f" key

Press this, the "y" for the "Are you sure", and BACKUP will format the disc in drive A. After formatting the files read under the "c" key are shown again, and you are taken back to the MODES MENU.

ANALYSIS - "a" key

Press this and you are shown a map similar to that for BLOCK VERIFICATION, except that it now shows which BLOCKS are

FREE	- green	- plus free memory
RESERVED	- magenta	- not available for use
USED	- cyan	- a file uses that block.
UNAVAILABLE	- black	- blocks over 174

Pressing any key will return you to the MODES MENU.

MAIN MENU - "M" key

Returns you to the MAIN MENU. Note you must press CAPITAL M!

COPY - "c" key

INTRODUCTION

This is used to copy files from one disc to another. Not only that but it saves them in a compacted form. If you original (source) disc has a file called "fred" saved on blocks 23, 30, and 35, they are rather spread around the disc which increases loading time. When copied onto your new (destination) disc, BACKUP will try to save the file into the lowest free BLOCKS (say 12,13, and 14).

MAKE SURE THAT YOUR SOURCE DISC HAS THE WRITE PROTECT TAB SET TO ON TO AVOID IT BEING ACCIDENTALLY WRITTEN TO. SIMILARLY THE DESTINATION DISC MUST HAVE THE TAB SET TO OFF TO ALLOW SAVING. You will be given an error message if this is not so, even if you have a two drive system.

ON SCREEN INFORMATION

Having pressed the "c" key to put BACKUP into the COPY mode you will see, near the bottom of the screen a line similar to the following:

File:11 TOT:0k Free:110k COPY

This shows that there are 11 files on this disc, with a free memory of 110k, and that you are in the COPY mode. TOT will be explained soon.

You will also see, on the bottom 2 lines, information telling you what various keys will do, and you will see a FLASHING SQUARE next to the first file on the left hand side of the page.

"I" - INFORMATION

By pressing the ARROW keys you can move the FLASHING SQUARE up, down, left, or right. If you press CAPITAL "I" (for Information) then the bottom 2 lines disappear and you are given extra information (lengths are given as numbers of BYTES, not in "k") on the file indicated by the flashing square.

If a CODE file, where it loads and its length.

If BASIC, the length of the file, length of the variables (the difference between these gives the size of the BASIC) and the LINE number - i.e the auto-run line number (if over 9999 then there is no auto-run)

If NUMERIC array, its length in bytes, and the letter (from-A to Z) under which it was saved.

If STRING array, as for NUMERIC array.

If PRINT files, then "I" is ignored as this sort of file only has a length.

NOTE: All programs in +3MATE except for CLONE and EDITOR assume that the disc has been formatted as a SPECTRUM type. It is possible for your PLUS 3 to read other types (e.g AMSTRAD format), but only CLONE and EDITOR will work on these.

CAPITAL "M"

Pressing this takes you back to the MAIN MENU.

PAGE - "p" KEY

If there are more than 36 files on the disc, only a maximum of 36 can be seen at any one time. Pressing the "p" key changes the screen from one page to the next. The current page number is shown near the bottom of the screen.

SELECT/DESELECT FILES TO COPY

With the FLASHING SQUARE pointing to the file you want to copy simply press ENTER. When you do this the letter showing the file TYPE will be reversed (yellow ink on black paper), showing that it has been "marked" for copying. TOT shows the number of "k" that is to be copied, so this will now change to the length of your first file. By selecting more files to copy, TOT will increase.

If you change your mind, and no longer want to copy a marked file simply put the FLASHING SQUARE next to the file name and press ENTER. The file type letter will go back to black ink on yellow paper showing that it is no longer marked for copying, and TOT will be reduced as appropriate.

You can mark as many files as you like, going from one PAGE to another as appropriate. When you have finished marking files for copying (even if none!), press CAPITAL "E" (for END). If you selected none you are taken back to the MODE MENU - see later.

CAPITAL "A" KEY:

This allows you to select/deselect ALL files, including any on

other PAGES not visible. When you press "A" all files will be selected and marked for copying. The next time you press "A" all will be deselected, and so on. "A" therefore toggles between all selected and none selected.

CAPITAL "E" KEY:
If there are files to copy you are asked to put the protect tab ON for the source disc to prevent accidental saving, then you press any key.

You are then asked to put the destination disc into your drive (drive B if you have 2 drives, drive A if only one), then press any key.

Backup now uses the state of the write protect tab to check that you don't accidentally put the wrong disc into your drive.

BACKUP does a CAT of your destination drive to check if any of the file names already exist, and to see if you have enough memory available. While it is doing this a 0 will appear next to COPY showing the destination drive is drive A. If it is 1 this shows that drive B is the destination drive.

If the DESTINATION disc already has files on it with the same names that you want to copy, you will be given a display of them, and they will automatically be all marked in inverse for erasing.

A flashing display says "DESTINATION FILES EXIST".

e.g you have marked 4 files on your source for copying, but 2 of them, "fred" and "test" already exist on the destination disc. These two files will be displayed and marked for erasing. Again you can use the cursor, select and deselect files to ERASE.

The COPY will now be changed to ERASE, and TOT will show how many "k" will be saved by erasing the marked files from the destination disc.

If you don't want to ERASE say "FRED" from the destination disc, then deselect it. BACKUP will then remove this file from its list to COPY. Having decided which files are to be ERASED from you DESTINATION disc, then press CAPITAL "E" and follow the on screen instructions. If there is insufficient memory of directory space on the DESTINATION disc you will be warned as appropriate.

If all is well then copying takes place. You are given a message like "COPYING 3k with 30k FREE", which would mean that you are copying 3k from your source disc, onto a destination disc that has 30k free. Simply follow the on screen instructions. Single drive owners will have to keep swopping discs depending on how much copying is to be done. BACKUP can hold approx 80k in its memory in one go. Having completed the copy you are taken back to the COPY mode with the same files marked for copying. This allows you to do more copies of the same files.

ERASE - "e" KEY - Easy erase of files.
The instructions to follow are almost identical to those for COPY. The display near the bottom of the screen shows that you are in ERASE MODE, and gives the number of files, and free memory. TOT shows how much memory will be saved in TOTAL when the marked files are eventually erased from the disc. Use the cursors to move the flashing square, and mark files to erase by pressing ENTER. Pressing enter again deselects the files, and selected files for erasing are shown with their TYPE being reversed. The "A" and "I" keys work in the same way as for COPY. When you have finished enter CAPITAL "E".

Provided that there are some files to erase BACKUP will erase them. The write protect tab is not checked so if you have left it so that you can't save to the disc then the files will NOT be erased.

After erasing BACKUP will CAT the disc again.

UNDELETE or UNERASE - "u" KEY - gets back erased files.
Once you enter this mode, you can only go back to the MAIN MENU. When you press "u" the display shows a list of all files that have been ERASED. The display is, as usual, in a half page similar to the following.

NAME		con
FRED	.bas	u NO
TEST		u ok

Next to the file name is the letter "u", for unerase, then either "NO" or "OK". The "NO" shows that it is unlikely that you can unerase the file, as another file is claiming the same block(s) that your displayed file requires - i.e. it has probably been over-written. If "OK" then it is likely that it can be unerased, as the block(s) are unused by any other file.

Simply follow the usual proceedure, moving the FLASHING SQUARE with the cursors, using ENTER to select and deselect files, in just the same way as the COPY MODE. You will see that UNDEL reminds you that you are in the UNDELETE MODE, and TOT shows the TOTAL (in "k") of memory that is being undeleted. At the end press CAPITAL "E", and after the usual "sure" prompt, BACKUP will unerase marked files. BACKUP will then CAT the disc again, and return to the MODE MENU.

MANUAL FOR CAT.

LOADING IN CAT
IF YOU HAVE 2 DRIVES, REMOVE ANY DISC FROM DRIVE B. Reset your SPECTRUM. Place the +3MATE disc into the drive, and press ENTER (i.e use the "LOADER" option) and wait. Then press key number ONE and wait. Remove your +3MATE disc from the drive.

MAIN MENU
You now have 2 options. The % key will perform a NEW and return you to +3 BASIC. Press "c" will do a CAT of the disc in drive A.

OPTIONS

After doing the CAT the screen will show the files on screen. As usual, if there are too many, the "p" key will change from one page to the next.

EXPLANATION OF FILE INFORMATION.

The screen display will be something like this:

No	NAME		T	len	Information
01	FRED	.	B	001	000001, 00804
02	TEST	.	C	007	59000,06026
03	STRING		$	001	A$(), 00013
04	NUMBER		N	001	B(), 00053
05	JOHN		P	001	PRINT FILE

The left hand side is simply the number of the file. Then follows the files name (? will replace characters under 32 or over 128).

Under T (for TYPE) will be B=BASIC, C=CODE, P=PRINT FILE, $=STRING ARRAY, N=NUMERIC ARRAY ?=UNKNOWN.

Under len will be the length of the file in "k".

Finally under Information will be the following, depending upon the file type.

BASIC - first the auto-run LINE number, then the length of the file in bytes. (over 9999 won't auto-run)

CODE - first the LOAD ADDRESS, then the length in bytes. The load address is the address from which it was saved, and into which it will load unless you specify otherwise.
e.g LOAD "TEST" CODE (loads into 59000), but
LOAD "TEST"CODE 50000 would load it into 50000.

PRINT FILE - no extra information is possible.
STRING ARRAY - the letter and the length, in bytes, is shown.
NUMERIC ARRAY - as for string array.

LOWER SCREEN DISPLAY.

A display of information similar to the following will appear.

FREE: 10k FILES: 45 PAGE 1/2

Free indicates free memory (in "k"). Files, the number of files on the disc. Page shows the page number - in the above you know you are seeing the first page of 2. Pressing "p" would change this to 2/2, and so on. The "p" option will only appear if there is more than one page.

CAPITAL M - takes you back to the MAIN MENU.

THE "1" KEY - output to PRINTER (for LPRINT).

Pressing "1" sends the data to your printer. If the file was BASIC, then the total length of the file is printed, and in brackets, the length of the BASIC part - the difference between these would give the length of the variables.

(note we have assumed that you have a centronics type - the program simply uses LPRINT. If you have an RS232 printer, then set this up with the correct baud rate and so on BEFORE loading our CAT program. In this way we HOPE the data can be saved onto your printer system.)

THE "i" KEY - for INFORMATION.
By moving the FLASHING CURSOR up and down you can select a file for more INFORMATION. Simply press the "i" key when the FLASHING CURSOR is pointing to the correct file. The screen is then cleared, with the file number, name, type, and length, and information repeated at the top. A map of the BLOCKS USED BY FILE also appears. This looks like the BLOCK VERIFICATION MAP, except that the cyan square shows you the block number(s) used by the file. Black, magenta, and green show unavailable, reserved, and "not used by this file" blocks respectively.

MANUAL FOR EDITOR

LOADING IN EDITOR
IF YOU HAVE 2 DRIVES, REMOVE ANY DISC FROM DRIVE B. Reset your SPECTRUM. Place the +3MATE disc into the drive, and press ENTER (i.e use the "LOADER" option) and wait. Then press key number FOUR and wait. Remove your +3MATE disc from the drive.

INTRODUCTION
This program is for the more technically minded. We have a TECHNICAL INFORMATION B section that gives you more details on how the PLUS3 disc system operates.

This program will allow you to load in a particular sector. It even works on NON-SPECTRUM formats (e.g AMSTRAD type). It will load in a particular sector, then allow you to alter it, and then to save it back onto the disc. It also has some other useful features.

GETTING STARTED - LOADING IN A SECTOR.
Having loaded in EDITOR, you are asked to enter the TRACK and SECTOR number that you want to load into EDITORs memory. The TRACK number must be from 0 to 39, and the SECTOR number from 0 to 8. Note that EDITOR uses what is called the logical sector number. 0 means the lowest sector number on the track, and 8 is the highest. So if your disc was formatted as a SPECTRUM TYPE, which has sector numbers from 1 to 9, then EDITOR will regard sector 0 as 1, and so on. If it was the AMSTRAD format which has sectors from 193 to 201, then EDITOR will regard sector 193 as 0, 194 as 1, and so on.

The following table shows sector numbers

EDITOR	SPECTRUM FORMAT	AMSTRAD CPC FORMAT
0	1	193
1	2	194
2	3	195
3	4	196
4	5	197
etc.		

You are required to confirm your choice by pressing "y" for yes, and after loading are taken to the MAIN MENU.

MAIN MENU
Here there are 5 options.

KEY	PURPOSE
1	Load in another sector
2	Filter sector
3	Examine sector
4	Save sector
5	NEW program

Pressing key "5", then after a "Are you sure" check, the program NEWs itself, returning to +3BASIC.

Key "1" returns you to the LOAD SECTOR stage.

Key "4" saves the sector in EDITORs memory, having changed it in some way or other - you will have done this by using keys "2" or "3". There is the usual "Are you sure" check.

KEY "3" - EXAMINE SECTOR
A sector contains 512 bytes. When you press "3" the screen will clear, and the left hand side has a column of numbers with yellow paper. In the middle are numbers in a chequered pattern in red/blue, and on the right hand side are characters with yellow paper. The screen is thus split into 3 parts.

Sample screen display:

```
      000  69  80  82  73  32  32  32  32  32     EPRINT
      009  84  88  84  00  00 100  00  00 200     TXT.....
      018  00  00  77  69  82  71  69  32  32     ..MERGE
etc
           Byte 0                          Byte 8
```

EXPLANATION OF SCREEN DISPLAY:
As we have said, a sector on your disc holds 512 bytes, which we have numbered from 0 to 511. In the example above the first number in the middle section (chequered red/blue) is 69, which is the first byte in the sector (byte 0). The next is 80 (byte 1) the next 82 (byte 2) and so on along the ROW. The last number is 32 (byte 8) in that row. Now moving along to the second ROW in the middle we have 84 (byte 9). So the middle shows all the bytes, with nine on any one line. The numbers on the left act as a quick counter, and show the byte number of the next entry. So next to 018 is the 18th byte, in the example above this is 0. Now the right hand side shows the CHR$ for the nine bytes in that ROW provided they are between 32 and 128. If they are outside this range the charactor is shown as a dot. This allows you to read text easily. So the right hand side shows EPRINT as they are the CHR$ of 69 80 82 73 78 and 84.

EXPLANATION OF OPTIONS

The bottom of the screen shows your OPTIONS

KEY	PURPOSE
c	copy - to printer
p	enter POKE mode
m	go to MAIN MENU
n	next page
l	last page
a	alter 1st display byte

Pressing "c" sends a copy of the screen to your printer. As for CAT, the program uses LPRINT. If you have a RS232 printer, then try setting it up with the FORMAT command before loading in EDITOR. Pressing "m" returns you to the MAIN MENU.

The "n" (for next) makes the screen clear, and the next page of bytes is displayed (like the "p" key in the other programs), whereas "l" (for last) displays the last page. So when the examine option is entered the first BYTES that appear on the screen are numbers 0-179. Pressing "n" will change the display to show BYTES 180-359.

By pressing the "a" key you can decide yourself which is the first byte that should be displayed - all you do is to press the "a" key and enter a number between 0 and 511 and the press ENTER. The screen will clear and the NEW first byte will now appear on the top left hand side of the screen.

Finally the "p" key for POKE. This allows you to change or POKE the numbers. e.g. in the above example suppose you wanted to change EPRINT to FLINTS.
Press "p" to get into the POKE MODE. You are then asked to ENTER the first byte number. In this case it is simply 0 (if you had wanted to change TXT, then you would have entered 9 at this stage). Now all you do is to enter the new CODE values representing the letters of the word FLINTS which are 70, 76, 73, 78, 84, and 83 respectively. Note that the BYTE number and the old value appear at the bottom of the screen. Having entered the new value the screen is cleared and updated. When you have finished with this the press "m" to return you to the options menu. At this stage you haven't changed anything on your disc - you have just edited the numbers within EDITORs memory.

To save the new values to DISC use key "4", SAVE to sector. You are given the Track and Sector numbers from which it was loaded and asked if you want to SAVE to them. Press "y" or "n". If you press "n" you are given the chance to SAVE to another Track and Sector number instead of the original from which it was loaded. Having entered a different set of values you are asked to confirm that this is ok before the final saving to disc takes place.

KEY "2" - FILTER SECTOR

By pressing this key you can restrict the size of the bytes for part or even all of the 512 bytes in the sector. This is handy when a sector has been corrupted, and is say a word processor file, when the bytes should be between 32 and 122. You are asked to enter values one at a time. We will look at a specific example to help. Suppose that you wanted to make sure that all bytes from BYTE NUMBER 50 to BYTE NUMBER 100 (inclusive), were between 32 and 122. If they were outside the range of 32-122, you want them replacing with the code for a "?", which is 63. This is how you would answer the questions:

Lowest sector number - enter 50
Highest sector number - enter 100
Minimum value - enter 32
Maximum value - enter 122
Default value - enter 63.

Pressing "m" rather than a number, EDITOR takes you back to the MAIN MENU. After you have finished you are asked to confirm the filtering process. If you reply "y", then the changes will take place. As for the POKE option, nothing is yet changed on your disc. You have to go through key "4" - SAVE TO DISC, for this to take place.

TECHNICAL INFORMATION B

DIRECTORY BLOCKS

This part has been included to help you make full use of the EDITOR program. We are going to explain more fully how the SPECTRUM PLUS 3 uses its DIRECTORY BLOCKS. The following lists the Tracks and Sectors used.

Track 1 Sectors 0 and 1 - Directory block 0 (1k long)
Track 1 Sectors 2 and 3 - Directory block 1 (1k long)

So for the directory we have 2k of memory or 2048 bytes. This is split into a maximum of 64 entries. Each entry has 32 bytes available to it. Once all 64 entries have been used up, the error message "directory full" appears. That is why it is impossible to save 65 files onto your Plus 3 disc, even if they are all only 1k long - the directory can only hold 64 entries!

Let's imagine that you have just formatted a disc. All 64 entries will be blank, and each of the 32 bytes associated with each entry will be set to 229. This number is called the FILLER BYTE - the memory area must have some number or other in it, and 229 is chosen for this purpose. Use EDITOR to load in Track 1, Sector 0, and you will only see 229s. Now imagine that you now saved a simple basic file called FRED of length 2.5k. The PLUS 3 would save this BASIC to BLOCKS 2, 3, and 4. At the same time, the 1st entry in the directory (Track 1, Sector 0) whould have its entries changed from all 229s to the following.

Byte nu:	0	1	2	3	4	5	6	7	8	9	10	11	12
	0	67	82	69	68	32	32	32	32	32	32	32	0

Byte nu:	13	14	15	16	17	18	19	20	21	22	23	24	25
	0	0	19	2	3	4	0	0	0	0	0	0	0

Byte nu:	26	27	28	29	30	31
	0	0	0	0	0	0

BYTE 0:
Now the first byte of the 32 allocated for this 1st entry (byte 0) is zero. This indicates the USER NUMBER. If you had saved the file using SAVE"5:fred" then this first number would have been 5. It also has one more special feature. When you erase a file, this is changed to 229 - as explained before, when erasing all that happens is a change in the directory, and this is it - the USER NUMBER becomes 229!

BYTES 1-8:
The next 8 numbers stand for the file name (bytes 1-8). In our example we have FRED (and 4 spaces), as the CODE of "F" is 67, "R" is 82, and so on. The CODE for a space is 32.

BYTES 9-11:
These show the file type. In our example all three are spaces. If we had saved "FRED" as "FRED.bas", then these three bytes would have been 66, 65, and 83 representing "B", "A", and "S" (they are saved with capital letters).

BYTES 12 and 14:
Shows the extent number - we will come back to this - in our example they are zero.

BYTE 13:
Is unused.

BYTE 15:
Shows the length of the file in lots of 128 bytes. So if our file is 2300 bytes long this will show as 19. If is not particularly important to us.

BYTES 16-31:
This shows which blocks have been allocated to our file. In this case you can see it shows 2, 3, and then 4. The rest are set to zero.

So every entry on the directory is 32 bytes long, telling the Spectrum the user number (229 = erased), the next 8 bytes the first part of the file name, the next 3 the attribute file name, then after neglecting the next 3, the length of the file in lots of 128k, and finally the last 16 bytes show which blocks the file used.

LONG FILES;EXTENT NUMBER.
You may have detected a problem with the above. Suppose that the file is over 16k - there is not enough room in 1 entry to show which blocks have been allocated. So what the Spectrum does is to allocate more than 1 entry to the same file. Suppose that you format your disc, and then save the following:

```
SAVE "5:FRED"code 0,50000
```

Now load in EDITOR and Track 1, Sector 1, and enter the examine mode. You would see that our file named FRED would occupy 4 entries: Entry 1 for the first 16 blocks, Entry 2 for the next 16 blocks, the third for the next 16 and a fourth for the last single block.
(50000 bytes = 48.8k and needs 49 blocks)

Note that for each entry the first number is 5 (the user number), then entry 1 has bytes 16-31 as 2,3,4,5,... up to 17
then entry 2 has bytes 16-31 as 18,19,..... up to 33
then entry 3 has bytes 16-31 as 34,35,..... up to 49
and entry 4 has bytes 16-31 as 50,0,0,.... ending in 0

Note that byte 12 for entry one is ZERO, but for entry 2 it is ONE, entry 3 it is TWO, and entry 4 it is 3. In reality this is likely to be the only byte used to show the extent number. Byte 14 is also available, but only comes into play if there are more than 31 extents! So the extent number is the entry number for that file, starting at zero.

FILE TYPE

Finally, you might wonder how the Spectrum knows which file type is loading in - it could be BASIC or CODE or others. To find this out you must load into memory the FIRST BLOCK of the file, and examine the first 128 bytes, the so called HEADER RECORD. These bytes are not part of the file, they are added to the file to give the SPECTRUM information it needs. So when you save, say a CODE file so: SAVE "FRED" CODE 20000,500 you need 500 bytes saving plus 128 bytes for the HEADER RECORD.

This is how they are allocated:

Bytes 0-7	PLUS3DOS - a signature - always present
Byte 8	set at 26 (end of file byte)
Byte 9	issue number
Byte 10	version number
Bytes 11-14	Length of file in bytes
Bytes 15-22	+3 basic header - see below.
Bytes 23-126	reserved - set to zero
Bytes 127	checksum

(see Spectrum manual p.213)

The important part as far as we are concerned are bytes 15-22, explained on p.225 of the Spectrum manual.

Byte 15 gives the file type (0=Basic, 1=Numeric array, 2=String array, 3=Code).

The value of byte 16 + 256* byte 17 gives the length of the file (in bytes).

Byte 18 + 256* byte 19 gives the auto run line number if the file is BASIC, and the LOAD address if a CODE file.
Byte 19 gives the letter of the array if string or numeric.

Byte 20 + 256* byte 21 only applies to BASIC. It tells the Spectrum the length of BASIC. The difference between this and the length of the file given by bytes 16/17 shows the size of the variables area. This is because when you save BASIC you also save all the variables as well. If there aren't any, the the values of bytes 15/16 will be the same as bytes 20/21.

TABLE OF TRACK/SECTOR AND BLOCK NUMBERS

Simply read inside the table to find the BLOCK NUMBER.
e.g TRACK 4, SECTOR 3 = BLOCK 15.

TRACK NU:	SECTOR NUMBER								
	0	1	2	3	4	5	6	7	8
0	-	-	-	-	-	-	-	-	-
1	0	0	1	1	2	2	3	3	4
2	4	5	5	6	6	7	7	8	8
3	9	9	10	10	11	11	12	12	13
4	13	14	14	15	15	16	16	17	17
5	18	18	19	19	20	20	21	21	22
6	22	23	23	24	24	25	25	26	26
7	27	27	28	28	29	29	30	30	31
8	31	32	32	33	33	34	34	35	35
9	36	36	37	37	38	38	39	39	40
10	40	41	41	42	42	43	43	44	44
11	45	45	46	46	47	47	48	48	49
12	49	50	50	51	51	52	52	53	53
13	54	54	55	55	56	56	57	57	58
14	58	59	59	60	60	61	61	62	62
15	63	63	64	64	65	65	66	66	67
16	67	68	68	69	69	70	70	71	71
17	72	72	73	73	74	74	75	75	76
18	76	77	77	78	78	79	79	80	80
19	81	81	82	82	83	83	84	84	85
20	85	86	86	87	87	88	88	89	89
21	90	90	91	91	92	92	93	93	94
22	94	95	95	96	96	97	97	98	98
23	99	99	100	100	101	101	102	102	103
24	103	104	104	105	105	106	106	107	107
25	108	108	109	109	110	110	111	111	112
26	112	113	113	114	114	115	115	116	116
27	117	117	118	118	119	119	120	120	121
28	121	122	122	123	123	124	124	125	125
29	126	126	127	127	128	128	129	129	130
30	130	131	131	132	132	133	133	134	134
31	135	135	136	136	137	137	138	138	139
32	139	140	140	141	141	142	142	143	143
33	144	144	145	145	146	146	147	147	148
34	148	149	149	150	150	151	151	152	152
35	153	153	154	154	155	155	156	156	157
36	157	158	158	159	159	160	160	161	161
37	162	162	163	163	164	164	165	165	166
38	166	167	167	168	168	169	169	170	170
39	171	171	172	172	173	173	174	174	

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