

MICROTRANS - INTRODUCTORY SECTION.

Thank you for buying our Microtrans package of programs.
READ THROUGH THIS MANUAL AND FOLLOW THE INSTRUCTIONS.

PROGRAMS PROVIDED

You are provided with "MICROTRANS" and a program called "RUN". If you bought the program on tape, this is the order in which they have been placed, separated by a short gap. Microtrans is a special program for m/drive owners that will allow you to copy from DRIVE to DRIVE or from TAPE to DRIVE. Note that the program makes an exact copy of the file when transferring from TAPE to DRIVE, and DOESN'T convert the program so that it will run on drive. We provide other software for this purpose. The RUN program allows easy "single key" erasure of files on your drive, a TRUE m/drive CAT, as well as options to save your CAT's onto many dot matrix or ZX printers.

GENERAL COMMENTS.

1. Before attempting to LOAD in any of the programs ensure that you have an EMPTY Spectrum. i.e switch it off and on again or type NEW (and ENTER), or RANDOMISE USR 0 (and ENTER).
IN ADDITION we WARN YOU that the programs might not LOAD or WORK PROPERLY when peripherals are attached (except Interface One).
MICROTRANS HAS BEEN SECURED AGAINST HARDWARE INTERFACES, AND WILL NOT EVEN LOAD WHEN SOME ARE ATTACHED (e.g Tech research Beta interface, multiface). Detach all such interfaces before use.
Printers should be switched off. It may be that your printer, joystick, or whatever has to be removed.
1. FOR TAPE BASED VERSION OF MICROTRANS
 - (a) Rewind the tape to the start of the program you want to load in (Microtrans is first, RUN is second).
 - (b) Use LOAD"", then press ENTER, and start PLAY on your recorder.
If the load fails rewind the tape and adjust the volume control on your recorder, and try again.
Sometimes your cassette recorder doesn't quite suit a particular copy. IF THE TAPE IS FAULTY THEN SEND IT BACK FOR REPLACEMENT - we normally are v.prompt!! Please mark the envelope "FAULTY".
2. M/DRIVE BASED VERSION
 - a. To load in MICROTRANS, make sure you have an empty Spectrum (enter RANDOMISE USR 0), and then simply press the "r" key (for run) and enter, then wait.
 - b. To load in the run program enter LOAD*"m";1;"RUN" and wait.
3. We are always updating our programs, and to obtain the latest version (after checking that there is one), simply SEND us a large STAMPED ADDRESSED ENVELOPE, THE COST and YOUR OLD TAPE. Please mark your package "UPDATE".

GUARANTEES

MONEY BACK GUARANTEE (not updates)

If ON RECEIPT you are not completely satisfied with your programs and want a full refund, send the tape back STRAIGHT AWAY. Please state your reason(s) for return, giving all details if for some strange reason the package failed to work. Sorry, but we can't afford to offer money back on updates. ALSO an SAE does speed up the process.

GENERAL GUARANTEE Your programs are guaranteed for 6 months. Send back the faulty copy and it will be replaced free of charge, but again an SAE will save you time.

ALL THE PROGRAMS IN THIS PACKAGE, TOGETHER WITH THE MANUALS ARE OUR COPYRIGHT, AND OTHER THAN A GENUINE PURCHASER FOR THEIR OWN USE ONLY, NO PART MAY BE REPRODUCED.

LERM, 10 Brunswick Gdns, Corby, Northants. Great Oakley (0536) 743845 (evenings between 6.00p.m and 9.0p.m). For a reply you MUST enclose a stamped addressed envelope.

MANUAL FOR "MICROTRANS" PROGRAM

INTRODUCTION

Microtrans takes the form of three independent sections:

- (i) Tape to Microdrive. Transfers programs containing headers onto Microdrive.
- (ii) Headerless to Microdrive. Transfers programs without headers onto Microdrive, creating headers for them.
- (iii) Microdrive to Microdrive. Allows copying of any type of file from one cartridge to another, including "protected" files not visible in a normal catalogue.

Each section of the program can cope with files of up to approximately 64K in length, without losing any bytes.

For those unfamiliar with technical terms such as "headerless", or the notation we use for Tones and Bytes (T B), etc, see the section of this manual called TECHNICAL INFORMATION

VERY IMPORTANT - ERRORS

During Microdrive operations, if ANY error occurs (apart from "Cartridge is full," which is created by Micro-Trans) this will NOT return you to BASIC, but to the Main Menu (see later). Unfortunately, the program will, from then on, NOT work correctly. When this happens, reload Micro-Trans from tape or microdrive and start again. We shall call these errors "Fatal errors" when referring to them in future. All of the fatal errors can be avoided by THINKING FIRST, before acting. Fatal errors will NOT damage your cartridge or your computer.

THE MAIN MENU

After the program has loaded successfully, the screen will show a series of options. These make up the "main menu" and are:

- Tape to Microdrive - press the "t" key
- Headerless to Microdrive - press the "h" key
- Microdrive to Microdrive - press the "m" key
- Quit the program - press the CAPITAL "Q" key

Pressing "Q" to Quit Program will reset the computer, leaving you with the Sinclair copyright message.

Two very important prompts appear at various stages in the program from now on - "Insert Source, press a key" and "Insert Destination, press a key" - both concerning placing microdrive cartridges (from now on just "cartridges") into microdrive "slots" (from now on just "drives").

When these prompts appear you have three choices - press "a", CAPITAL "Q", or any other key. Pressing "a" will abort the current mode and take you back to the main menu, losing ALL bytes loaded since the last save to microdrive. "Q" will Quit the entire program, resetting the Spectrum. Any other key will continue with the loading from/saving onto drive. From now on in these instructions these three choices will NOT be referred to, but they DO exist whenever the prompts appear. WE will always assume that you press neither "a" nor "Q".

TAPE TO MICRODRIVE - "T" MODE

"T" Mode transfers tape-based sections of program (with headers) onto microdrive 1, and copes automatically with very long programs.

Pressing the "t" key from the main menu will clear the screen and prompt you to play in a program to be transferred. Play through both the header and the bytes of ONLY the part you wish to be transferred.

e.g. for a program consisting of
T H T B T H T B T H T B
Basic loader Code 1 Code 2

of which you want Code 1, play the tape from the start of the second T H through to the end of the following T B.

After the header has played through, the name of the program will be printed on the screen:

e.g. File: Fred

...together with a loading message.

This loading message can be one of two forms:

"Loading" OR "Loading Part 1"

If "Loading" message appears - a "short" program

The computer will load the T B following the header, then prompt you to "Insert Destination, press a key". At this point STOP the cassette recorder playing, insert a cartridge into DRIVE ONE (NOT any other drive) and press a key - the program will then be saved automatically onto the cartridge.

Following this, you will be taken back to the main menu.

If "Loading Part 1" message appears - a "long" program

This means that you will need to play the section through twice - it is too long for one loading.

Keep playing the tape until the T B has finished loading. In fact, not all of the bytes will load - DO NOT PANIC!!! - This is deliberate and saves time. After the T B has finished, STOP the tape. Again a prompt appears to "Insert Destination, press a key". Do this, and Micro-Trans will, as you should see on the screen, Save part 1 (TO DRIVE ONE). After saving, "Loading Part 2" will appear. Now rewind the tape to the start of the section you wish to transfer, just BEFORE the T H. PRESS ANY KEY EXCEPT SPACE and play the section through again.

This time, all of the T H T B will load, and when this has finished, "Saving Part 2" will appear, together with "Insert Destination, press a key" (STOP the tape now - all loading has finished).

At this stage, it is NOT advisable to use either "a" or "Q", as you will be left with an incomplete file on the cartridge - it has only been partially saved. Pressing any other key will save the second, final part and return you to the main menu.

Summary

"T" Mode is made up of two parts, that cope with "short" or "long" lengths of bytes. Which part of "T" Mode is used depends on the header, and each follows a set sequence once selected.

False Headers

As the program relies on the header given it, "false" headers will confuse it. If you are unsure whether the program you wish to transfer has any false headers, use the "H" Mode (for headerless programs), and ignore the false headers.

Pressing BREAK

At any stage during the actual loading of any bytes, pressing

BREAK (caps shift/space) will take you back to the main menu, losing all of the bytes that have been loaded since the last save to drive.

This is the reason for not allowing the space key to be pressed after rewinding to load part 2 of a program - it would immediately cause a break from loading.

HEADERLESS TO MICRODRIVE - "H" MODE

"H" Mode transfers tape-based sections of program (WITHOUT headers) onto microdrive 1, and copes automatically with very long programs.

"H" Mode is very much like "T" Mode, but with one very important difference: whereas "T" Mode relies on information from a header, "H" Mode does not, and has to assume certain things.

As explained in the Spectrum manual, programs are of different types - Basic, Code, Numeric Arrays and String Arrays. The way of distinguishing between these types is contained in the header, so in "H" Mode it is assumed that the headerless program is CODE - as the vast majority of them are.

Obviously, as the header also holds the name of the program, "H" Mode doesn't know it! Here YOU get the choice of name - one character only, but ANY character obtainable using a single keypress, so duplicate names can be easily avoided.

The "h" key enters "H" Mode from the main menu. The screen will clear, and a message "Program Name:" will appear. Here, press the key corresponding to the name you wish - ANY character you can obtain by pressing ONE key will become that name. You can use both CAPS SHIFT and SYMBOL SHIFT to obtain others, so names such as "a", "F", "THEN" (symbol shift/G) etc. CAN be used, whereas "MERGE" (extended mode, symbol shift/T) CANNOT.

NOTE: Some "control" characters, such as "EDIT", "TRUE VIDEO", "DELETE" etc. will all appear as "?" but are still recognised as different names, though not very useful ones!

After naming your program, you are prompted to play it in, and a new "LOADING" message appears.

The procedure for loading and saving is basically the same as for "T" Mode, but you will only find out whether you follow the "long" or the "short" instructions AFTER the headerless T B has loaded, when either "SAVING" or "Saving Part 1" will appear.

If "SAVING" message appears - a "short" program

You should see the "Insert Destination" message. Stop the cassette recorder playing. Insert a cartridge into drive ONE, and press a key - the program will save, and then you will return to the main menu.

If "Saving Part 1" appears - a "long" program

STOP the cassette recorder playing.

Insert a cartridge into DRIVE ONE, in response to the (by now familiar) "Insert Destination" prompt, and press a key to save this part onto drive.

Rewind the tape to the start of the headerless section, and press any key EXCEPT space (this would cause a break from loading next).

Play the headerless section through once more, in response to the "Loading Part 2" message. After this has loaded, STOP the tape - all loading has finished.

The "Saving Part 2" and "Insert Destination" messages will appear. Press a key to save the last part. If you press "a" or "Q" you will be left with partially saved programs, so these are not recommended key presses at this point.

After the saving, you will be taken back to the main menu.

Summary

"H" Mode is virtually identical to "T" Mode, but there are important differences, which must be remembered.

False Headers

If you suspect that the program you are transferring has a false header, use "H" Mode, but NEVER play through the header - ALWAYS treat it as a headerless program.

Pressing Break

During loading, if you press BREAK at any point you will return to the main menu, and you will have lost ALL bytes loaded since the last save to drive.

IMPORTANT - DON'T FORGET

When you put ANY code saved by "H" Mode into your own programs (perhaps a BASIC loader) ALWAYS specify the start address after the CODE

```
e.g      NEVER      LOAD *"m";1;"F"CODE
         ALWAYS     LOAD *"m";1;"F"CODE <whatever>
```

MICRODRIVE TO MICRODRIVE - "M" MODE

"M" Mode will transfer microdrive-based programs onto any other cartridge, in any drive. It copes automatically with very long files, and provides the facility to copy an entire cartridge. If you have only one drive, you are prompted to change cartridges when necessary.

Pressing the "m" key will clear the screen. Then, two similar prompts will appear, in quick succession - "Source Drive:", then "Destination Drive:" - both will wait for your input.

The "Source Drive" prompt expects a number in the range 1 to 8 inclusive - the drive that will hold the cartridge containing the program TO BE COPIED. Any character not a valid drive number will be ignored.

Once a valid number has been entered as the source drive, the "Destination Drive" prompt will appear. Again it will wait for a valid drive number, which will signify the drive holding the cartridge ONTO WHICH THE PROGRAM WILL BE COPIED.

NOTE: It DOES NOT MATTER if you only have one microdrive. Enter both source and destination drives as 1. You will be prompted to "Insert Source" and "Insert Destination" whenever this becomes necessary.

After you have entered 2 legal drive numbers, "Input Source, press a key" (this will appear WHATEVER the drive numbers). The source drive will then start up, and after a few seconds the screen will again clear and you will be presented with a catalogue of the source cartridge, though in a new form.

NOTE: If the source cartridge is TOTALLY blank, this catalogue will NEVER appear - but if it is totally blank, obviously nothing can be copied OFF it! So to avoid this happening, CHECK that you are using the correct cartridges beforehand.

What does the catalogue show?

Well, the display after the drive stops obviously depends on the cartridge, and is multi-coloured, so it is best to follow this explanation with a catalogued cartridge on-screen.

In the top left-hand corner of the screen is the name of the CARTRIDGE (ie. that given to it by the FORMAT command from Basic), e.g "Name: Games".

At the right-hand end of that line appears the amount of memory

free on that cartridge, to the nearest 0.5K (ie. twice as accurate as the normal catalogue), e.g "27.5K Free". In the lines below this are the actual filenames of the files on the cartridge. You will no doubt have noticed (if you have a typically "messy" cartridge with a lot of files on it) that the filenames are printed in different colours (or shades of grey).

What do the colours mean?

As explained earlier (in the "H" Mode section) there are many different "types" of file - Basic, Code, etc.

To show a complete catalogue (up to 50 files normally) on one screen needs three filenames per line - so to show these names in different colours means that their "type" can be shown without using up extra space.

The colours for each type are:

No.	Type	Paper	Ink
0	Basic	0/Black	7/White
1	Numeric Array	2/Red	7/White
2	String Array	4/Green	7/White
3	Code	5/Cyan	0/Black
4	Print file	7/White	0/Black

If you have a black and white TV or monochrome monitor, you will have noticed that the higher the type number, the lighter the shade of grey - this is to help you differentiate between the types.

It may look confusing at first, but you soon get used to the different types.

Filenames you've never seen before

As explained in the microdrive manual, filenames beginning with CHR\$ 0 do not appear on catalogues - but they do now!

"Invisible" files beginning with CHR\$ 0 show up on THIS catalogue normally, with their correct name, however the first character (which was CHR\$ 0) is now the copyright symbol (C).

When copied, the filename retains the original CHR\$ 0 start.

Also, some ridiculous filenames may appear. These are not your fault, nor ours, but the Interface 1s - under certain circumstances, files can appear on the cartridge as if from nowhere - they can be ignored, or copied if you wish! They show up on THIS catalogue as type 4, a print file (though they're not), begin with (C), the copyright symbol (what was CHR\$ 0) and contain garbage - e.g (C)Menu";B89 - and can possibly contain other (C)s as well.

On newly formatted cartridges (which are thought to be totally blank) these CAN appear, so you may find that using one as the source cartridge DOES give a catalogue (not recommended - it might not!).

Multiple Copies

You may find that many files have the same name. This is because they were saved using a special technique to obtain multiple copies of the file. Unfortunately you can only copy one of these onto a new cartridge - any more will cause a fatal error.

COPYING FILES

In this part of "M" Mode there are 2 sections, one following the other. The first section is concerned with selecting the files you wish to copy, the second with the copying of the files.

Selecting

Summary of keys	
KEY	Purpose
UP 7	Move file cursor up
DOWN 6	down

LEFT 5	Move file cursor left
RIGHT 8	right
SPACE	Select/deselect current file
e	Select every file
ENTER	Start copying files

The file cursor is the flashing square on the last character of a filename, and signifies the "current" file.

To move the file cursor, owners of the "original" Spectrum can use keys 5,6,7,8 (unshifted) whereas Spectrum+ owners can use the arrow keys on either side of the space bar.

Use these keys to move around the filenames, and for each file you wish to copy, tap the space bar while the file cursor is on the last character of that filename. The entire filename will flash (NB the last character holds the cursor - when you move the cursor from a selected file, the last character of that file will not flash, so you can make out where the cursor is!).

Pressing the space bar over a selected (flashing) file will deselect it (ie. it will stop flashing).

If you wish to copy an entire cartridge (or most of it) pressing the "e" key will select Every file. You can then deselect those you DON'T wish to copy (if any).

When you have selected all the files you wish to copy, pressing ENTER starts copying. If you selected no files, ENTER would take you back to the main menu.

Copying

Copying is, for owners of more than one drive, simply a matter of putting the source and destination cartridges into their respective drives, pressing ENTER from "select" mode, and waiting! The Source and destination drives will start up and stop alternately, with the name of the file currently being copied shown near the bottom of the screen.

For owners of one microdrive ONLY, or for those who for some reason choose both source and destination drives to be the same, a certain amount of cartridge swapping will be needed. You will be prompted at all necessary times which cartridge to insert. Pressing ENTER from the "select" mode will prompt you first for the source cartridge, followed by alternating "Insert Destination" and "Insert Source" prompts until all copying has finished.

Short programs need two swaps EACH

Long programs need four swaps EACH

ie. - Short program: Insert Source <wait>
 Insert Destination <wait>
 Finished

Long program: Insert Source <wait>
 Insert Destination <wait>
 Insert Source <wait>
 Insert Destination <wait>
 Finished

In general the second half of the copying process for a long program takes much less time than the first.

If an error occurs (probably "Cartridge is Full", which is NOT fatal, unlike other error messages) you will have to eventually ERASE the file that is currently being copied, as it will be incomplete. Pressing a key from the "Cartridge is Full" error message will take you back to the main menu. If a cartridge is completely full before anything is saved (ie. before pressing ENTER from "select") a fatal error WILL occur.

The same conditions for full cartridges apply in "T", "H", and "M" Modes. If you are unsure, use the "M" Mode just for cataloguing to check if you have enough room on a cartridge, or if it is full - remember, pressing ENTER from "select" without selecting any files takes you back to the main menu.

Summary

"M" Mode copies any number of programs on a cartridge to any other cartridge in any drive. The selection of files is made by easy-to-use cursor movement using arrow keys, with the facility to select all files using one keypress. Copying is automatic, apart from cartridge changing if you have only one microdrive.

Pressing Break

There is a simple rule - DON'T!!

This will cause a fatal error if any drive is running at the time, so it is extremely inadvisable, for your own sanity!

NOTE: Lerm Software on microdrive will NOT be copied by MicroTrans - This infringes our copyright and so has been made impossible.

MANUAL FOR "RUN" PROGRAM

INTRODUCTION

This program is designed to be transferred onto one or more of your cartridges. It enables you to neatly catalogue all the titles on one or all of your cartridges, make a hard copy (print-out), having previously erased all your unwanted files, without having to type ERASE "m";1;"prog" for each erasure. You can then load in any basic program or some code. In addition you can also produce an EXTENDED or TRUE Catalogue, giving you full details of your files such as auto line number for basic, or for CODE, its length, and where it is placed, etc. You will find this a very useful "house-keeping" program, particularly if you have a printer.

GETTING STARTED

ENSURE THAT YOU HAVE A FORMATTED CARTRIDGE IN DRIVE 1 BEFORE LOADING IN THIS PROGRAM, WITH APPROX 6k OF FREE MEMORY.

1. If you bought Microtrans on m/drive cartridge then enter LOAD*"m";1;"RUN" and wait. Note the name has CAPITAL letters, unlike when it copies itself. If you bought Microtrans on TAPE, then you will find that the "RUN" program is the SECOND on the tape (after the beeps). To load it use LOAD"" and enter.

WHEN LOADING IS COMPLETE DRIVE 1 IS CATALOGUED, together with a "MENU" that appears on the bottom of the screen.

If you bought Microtrans on cartridge, a message "invalid colour" will appear, and the program will stop running.

2. Now the program is set up assuming that you have
(a) one m/drive (b) a ZX printer
however these are changeable - see step 4. (You may even want to put 2 different versions onto 2 separate cartridges).

3. (a) To save the program AS SET UP simply enter BREAK (caps shift and space key held down together for a few seconds), when the program is displaying the catalogue of your cartridge (i.e

at the MENU).

(b) NOW type GOTO 9000 (with your cartridge present) and wait a while. There will be a 8 seconds or so pause before saving is started. Just wait until the operation is complete. In future all you have to do is to type LOAD*"m";l;"run" to load it in.

ALTERNATIVELY if the computer has just been switched on OR you have just entered NEW, then all you have to do is to enter the "r" key (for RUN) - see m/drive manual p.15 for more information

4. ALTERING 2(a) and 2(b)

Instead of typing GOTO 9000 at stage 3(b) you can alter the basic as follows:

To change the number of m/drives EDIT line number 18 altering the bd to the number of drives you have. (e.g for 2 drives line 18 should have LET bd=1 altered to LET bd=2)

To change the printer format:

If you DON'T HAVE A PRINTER change line 217 by typing
217 If c="3" THEN GOTO o (and then ENTER - note this is the letter "o", not the number zero)

To alter for a dot matrix printer:

Ensure that any code needed to drive your printer is placed on your m/drive. To do this remove the REM statement from line 15, and alter it to load in your printer software. It has been set up (when the REM is removed) to load in the printer software we have for a STAR printer which loads in the "pc" and requires a RANDOMISE USR 65150 to "set it up". Your printer software can be placed anywhere above 36000, or in the printer buffer itself.

You may need to add some lines of your own. The program works by using the fact that PRINT#2 sends information to the screen, and PRINT#3 to the printer using lines 150 to 190.

When all is set up follow the instructions from 3(b) onwards.

NOTE also that if you accidentally enter break, GOTO 17 will give a fresh start, and catalogue your cartridge. YOU CAN ONLY TRANSFER THIS PROGRAM TO M/DRIVE USING THE TAPE PROVIDED!

USING THE PROGRAM

We hope that it is user friendly anyway, but the following indicate the features.

- a. When the program has done a catalogue you usually have one of 5 (or sometimes 6) options:

Pressing l allows you to load in a program. You are asked which number, and if you are sure, and whether or not it is CODE. (for a basic program the answer to the latter question is no!). If you load in CODE you are asked if you require to use the CLEAR instruction. Also all code is loaded directly into where it was saved from.

NOTE that if the program doesn't AUTO run when loaded you get an error at line 300 report - this is quite normal.

- b. Pressing h gives you a "hard copy" of the catalogue.

- c. Pressing c allows you to re-catalogue. Note if you have set it up for more than one drive, you are asked which drive number, with the option to stop the program by entering 0.

- d. Pressing e This is perhaps the main feature of the program. You now enter the number(s) of the programs you want erasing. They are then flashed to remind you of the numbers. When you have finished entering the programs to be erased enter "e". You are asked if you are sure. If not then you are returned to the main menu. If you pressed "y" then the programs are automatically erased in the order of entry, the name being removed from your catalogue after that program has been erased.

A ? appears on the top line right hand side after erasure, as the "free memory" on the cartridge will have been altered as spare room will be created. If you need an up-to-date record, then press 4, and do a re-catalogue of the same cartridge.

- e. Sometimes another key option "p" appears. If there are more than 34 programs on your cartridge, then by pressing p you are "paged" from the first 34 programs, to the rest. By pressing p again you are paged back.
- f. Pressing t This allows you to produce an EXTENDED CATalogue for your m/drive cartridge. Having selected this option you are asked to press:
- (i) "t" for a t.v output
 - (ii) "h" for a hard copy (to printer)
 - (iii) "m" to a return to the MENU.

If t or h was selected then the program produces the extended CAT, noting however that this process takes some time. The "page" that was visible when this option was selected is catalogued. (e.g. if you have more than 34 files on the cartridge and are looking at the second "page" when opting for this option only the files displayed by that page will be given.)

For BASIC the auto run LINE number is given (65535 is displayed when there is no auto-run).

For CODE the address of where it is to be placed and its length are given

For arrays their letter and type are given (e.g. y%())

If a data file then you are simply told "DATA file".

After use you are taken back to the MENU.

TECHNICAL INFORMATION

TONE leader, BYTES, BLOCK of code, and PROGRAM PART

(i) TONE leader. (abbreviated T)

When you save or load in a program the first thing you see on the screen is some THICK red and CYAN border stripes. This is called the TONE LEADER (TONE for short). It is used as an introduction to ensure that your code is taken into the computers memory at the correct time.

(ii) BYTES (abbreviated B)

After the TONE there are some BYTES. These are usually easily spotted because you normally see NARROW yellow and blue stripes. In fact they can be made other colours, or by using machine code, the border colour can remain unchanged. BYTES are the actual numbers (in the range 0-255) that are put into the computers memory. i.e BYTES include basic, machine code, data. ALL are bytes, it is just that they have different purposes.

(iii) BLOCK of Code.

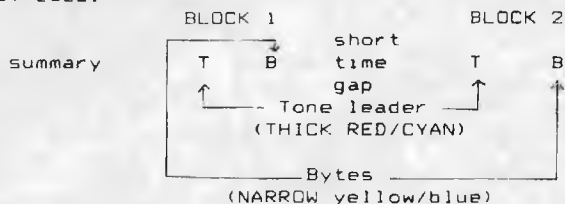
A tone leader, together with the bytes that follow are called a BLOCK of code.

(iv) PROGRAM PART.

Suppose you load in a simple piece of BASIC into your computer. What happens?

First you will see T (Tone), then a short burst of B (bytes). This is the first block.

Secondly, after a short time, you will see a second T, followed by a longer burst of B, the time that this second B lasts depends upon how long your program is. You have thus a second BLOCK of code.



The two blocks combined we shall call a PROGRAM part. Thus if you save some BASIC (TB TB) and then say an array of data (TB TB) you have saved TWO program parts, as your complete program has two "parts" to it.

If on the other hand you save some Basic, and then some code, and then an array, then your program would have 3 program parts.

Finally note that the BYTES (B) although usually NARROW yellow/blue can be changed by a programmer to other combinations. You can really recognise BYTES by the fact that the lines are NARROW rather than by their colour. In a similar way the colour of the TONE may be altered.

HEADER

Above we didn't quite tell the whole story.

Suppose again you load in a simple Basic program.

FIRST you see the thick RED/CYAN stripes of the TONE leader (i.e an introductory sound to prepare for loading)

SECOND you see a SHORT burst of NARROW yellow/blue.

i.e you have the first BLOCK T B.

This FIRST burst of B is called the HEADER, and is short since a HEADER contains only 17 bytes (or numbers).

The HEADER tells the Spectrum the type of program it is loading in, where to load it, and its name. Thats why just after this you see a message like

Program: Fred or Bytes: Fred

After this the second block would be loaded in. First the TONE (T), and LAST you see some more yellow/blue narrow border lines which show the Basic bytes being loaded in.

summary: when loading in a single program part we see

BLOCK 1	time	BLOCK2
T H	gap	T B

NOTE we have now abbreviated the header as H, and changed from TB TB to TH TB.

The below gives you the details of the HEADER numbers.

HEADER DATA - Optional reading.

For the technically minded you are shown for any program its "header data". Spectrums have 17 numbers in their headers. This tells the Spectrum the programs name and other vital information. On the screen will appear something like
e.g HEAD:0-250-10-200

There will always be FOUR numbers shown.

What do they mean?

First number: 0= basic 1= number array 2= string array
3= code (loaded/saved using LOAD""CODE or
SAVE"name"CODE)

(thus example header above is BASIC)

Second number: gives the number of bytes that are to be loaded in.

(our example has 250)

Third number : If BASIC (i.e 1st number=0) this gives the AUTOMATIC line number from which the program would run. If this is greater than 32768, no AUTO run occurs.

If CODE (i.e 1st number=3) this indicates the address where the first byte should be loaded when placed in the computers memory.

Fourth number: This gives the number of bytes of BASIC if the first number was 0. (note this number will usually be less than the 2nd number as the latter includes bytes for the variables as well as the basic.)

(our example has 200, thus 50 bytes are used for variables)

e.g.2 for HEAD:3-780-36874-780

you would have CODE of length 780 bytes which would start to be loaded in from address 36874.

HEADERLESS PROGRAMS

All programs must start with a header, and then some bytes.

i.e TH TB.

After this the machine code programmer can do without "headers" altogether, as he/she can control where the bytes are to be loaded. These are so called "HEADERLESS" blocks.

e.g TH TB TB TB

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