Introduction.

The Starstick version 2+ ROM is at last here. It has taken far longer than anticipated to develop as it has been very difficult to know where to draw the line. There is always a temptation to make it compatible with just one more program. With this in mind we made a drastic decision, we totally redesigned the new issue ROM to have relocatable workspace. What is relocatable workspace? The Starstick needs a very small amount of non-user accessible memory for it to remember the options that you have selected, some 40 bytes in total.

Our problem was that various programs utilise memory in differing ways, and whilst we could make our ROM compatible with programs A,B,D,X,Y,Z, with the workspace at a certain location, it would not work with a similar number because of that location.

This called for the rom to contain relocatable workspace. Thus if and when it gets in the way of a program, it can be moved. Hence the command *PLONK which is used to 'plonk' the code to different areas of memory.

It is very important that the Starstick be in the highest priority socket on either your Rom board or in your computer. In your computer, this means that it should be located in the right most Sideways Rom socket. This is neccesary as some programs use some very peculiar methods of running. It is easier for us to 'snatch' back control of the computer from this socket position and in fact it might not work correctly in any other position. (A more detailed description is available on fitting the Rom in the relevant section).

Just in case you find that you are having difficulties caused by more than one Rom using the same command, we have made our instruction sets prefixable by M. This should help solve this problem.

The Starstick Joystick DOES NOT plug into the analogue port, it is a digital joystick and is plugged into the USER PORT on a BBC Computer. It does also need the Starstick Rom to be in the highest priority sideways Rom socket in either your computer or your Rom board. If in doubt take it to your supplier or your nearest dealer. Full fitting instructions are included with this package (see appendix 1).

It just leaves me the task of thanking you for purchasing this product from us, and to apologise to any customers who have been awaiting the arrival of the version 2+ Rom.

The following help messages can be obtained from the Starstick ROM after fitting, by typing the underlined commands into your computer.
<CR> implies pressing the RETURN key.

TYPE *HELP<CR>

[This Command indentifies any Acorn Format ROMs fitted into your Computer]

```
STARSTICK 2.20(Off)
 KEYS
 MICROTEST
 PRESETS
 STICK
 SUTILS

VIEW A2.1
  Stored
  Cmode

OS 1.20
```

[Under the ROM name you will see further Help Commands listed].

[For demonstration purposes we have fitted VIEW as well as the STARSTICK ROM].
[Also the operating system will announce itself].

TYPE *HELP KEYS<CR>

[Now we interrogate the additional help Commands].

```
STARSTICK 2.20(Off)
Work area       Intact.
Data area       Intact.
Adval           Off.
Prop            Off.
Repeat          Off.
Sneakiness      Off.
Replica catch   Off.
Elite catch     Off.
Data plonked at&0160
Code plonked at&34CB
Left            Nothing
Right           Nothing
Up              Nothing
Down            Nothing
Fire and left   Nothing
Fire and right  Nothing
Fire and up     Nothing
Fire and down   Nothing
Fire button 1   Nothing
Fire button 2   Nothing

VIEW A2.1

OS 1.20
```

[This Command will display Current key protocols as well as other technical information].

[VIEW insists on announcing itself as will some others]

TYPE *HELP MICROTEST<CR>

[We added this command just in case you needed to contact us with a technical query].

```
STARSTICK 2.20(Off)

 Produced by:

Microtest Ltd.
 18,Normandy Way,
 Bodmin,
 Cornwall.
 PL31 1EX

 Tel.Bodmin(0208) 3812 or 3171

 Written by:

 Intelligent Solutions (Cornwall).

VIEW A2.1

OS 1.20
```

+ SVCRSVN

TYPE *HELP PRESETS<CR>

[This command will display pre-programmed key protocols].

```
STARSTICK 2.20 (Off)

ACORN     (Z,X,:,/,Z,X,D,F, ,CR)
ACORN2    (Cap,Ctl,Sft, , , , , , ,CR)
CURSOR    (Lt,Rt,Up,Dn,Lt,Rt,Up,Dn, ,CR)
PPOWER    (_,Dn,A,Z,_,Dn,A,Z, ,Up)
SCRAMBLE  (_,Sft,A,Z, ,Sft,A,Z,Tab,CR)

VIEW A2.1

OS 1.20
```

FELIX

TYPE *HELP STICK<CR>

[This command will give you a list of STARSTICK programming commands along with their syntax].

```
STARSTICK 2.20(Off)

 ADVAL(<stick number>)
 NADVAL
  MAP(<key number>) (<key number>)
 NMAP
  PLONK (<data loc>) (<code loc>)
  PROP (<type>) (<speed>)
 NPROP
```

```
  REPEAT
 NREPEAT
  REPLICA
 NREPLICA
  RESET
  SETSTICK
 NSETSTICK
  SNEAKY
 NSNEAKY
  STICK
 NSTICK

VIEW A2.1

OS 1.20

TYPE  *HELP SUTILS<CR>        [This command lists
----------------------        utilities available].

STARSTICK 2.20(Off)
 KLOAD<fsp>
 KSAVE<fsp>
 KILL(ROM number)/(name)
 REVIVE(ROM number)/(name)

VIEW A2.1

OS 1.20
```

That rounds off the Help driven menus. For information pertaining to the ways in which these commands act please consult the relevant section of this manual (Chapter 3).

StarStick - Technical Information

Alphabetical List of Commands:

*ACORN
Invokes the pre-defined set of key definitions as shown in the table below (fig. 1).

*ACORN2
Invokes the pre-defined set of key definitions as shown in the table below (fig. 1).

*ACORN3
Invokes the pre-defined set of key definitions as shown in the table below (fig. 1).

*ADVAL (<Stick number>)
This command allows the switched joystick to take over the functions of one or both analogue joysticks. The stick numbers are as follows:

0 Neither (equivalent to *NADVAL)
1 Left joystick
2 Right joystick
3 Both joysticks (this is the default if no number is given)

After giving this command, testing the position of the relevant analogue joystick will return the position of the switched one.

*CURSOR
Invokes the pre-defined set of key definitions as shown in the table below (fig. 1).

*ELITE
Prepares the ROM to take special measures, and to enable Acornsoft's Elite to detect the fire button on the joystick. For the full procedure for running Elite, see below.

*FELIX
Invokes the pre-defined set of key definitions as shown in the table below (fig. 1).

*KILL (<ROM number>/<ROM name>)
Given either the number of a sideways ROM (in decimal) or enough of its name to distinguish it (eg. 'DF' will normally do for 'DFS'), will disable the ROM. Giving no name or number will disable the StarStick ROM. NB. After issuing this command for the necessary ROMs, you should hit BREAK in case they do anything silly. If the StarStick ROM is disabled it will still print its banner on hitting BREAK if there is no second processor, but

without giving its 'On/Off' status. Don't worry about this, it is completely normal and the ROM is really dead.

N.B. IF THE STARSTICK ROM IS *KILL'ED, trying a *REVIVE on it will not work as there will be no STARSTICK ROM available to intercept the command. The power to the computer will have to be turned off the on again to reinstate it.

---

*KLOAD <filename>
Loads a set of key definitions previously saved with '*KSAVE'. NB. This command may turn the joystick on if it was on when the definitions were saved.

*KSAVE <filename>
Saves the currently defined set of key definitions, repeat status, proportional type etc. to tape or disk so that commonly used sets of keys can be retrieved easily using '*KLOAD'.

*MAP (<key number>) (<key number>)
Maps one set of keys to another in much the same way as normal operation maps a set of keys onto the joystick. Mapping one set of keys onto another gives you the ability to use any set of keys you like for movement in your favourite game instead of the ones that the author has given you. Any or all of the ten slots normally used for joystick positions can be used to store key-key mappings. These are numbered 1-10 as follows:

Left	1	Fire and Right	6
Right	2	Fire and up	7
Up	3	Fire and down	8
Down	4	Fire button 1	9
Fire and Left	5	Fire button 2	10

To use any one of these for a key-key mapping use the command '*MAP <number>', to use several use the command '*MAP <first number> <second number>', to map all at once use '*MAP'. eg.

```
*MAP 1      Takes the place of Left
*MAP 1 4    Takes the place of Left, Right, Up and Down
*MAP        Takes the place of all positions
```

Having given the relevant command, you will be prompted for the pairs of keys required in the following way:

```
Map (1)              At this point press, say 'A'
Map (1) 'A' to       Now, press 'B'
Map (1) 'A' to 'B'
```

Having done this, pressing 'B' will make a game think that you have pressed 'A'. Note that mappings 9 and 10

invoke the auto-repeat facility (if enabled) if they are actually mapping one key onto another (mapping a key onto itself won't work).

*NADVAL
This has the same effect as '*ADVAL 0', that is to reverse the affect of any previous '*ADVAL' commands.

*NELITE
Turns off the '*ELITE' command.

*NMAP
This clears all of the key definitions and is identical to '*NSETSTICK'.

*NPROP
This cancels the '*PROP' command and makes the joystick appear to jump to which ever of the nine positions it is in, immediately. This command only takes effect when the '*ADVAL' command is used.

*NREPEAT
This turns off the auto-repeat function. (See '*REPEAT' below).

*NREPLICA
This turns off 'Replica' mode. (See '*REPLICA' below).

*NSETSTICK
This clears all of the key definitions and is identical to '*NMAP'.

*NSNEAKY
This turns off the effect of the ROM's 'SNEAKY' command.

*NSTICK
This turns off the joystick and keyboard mappings.

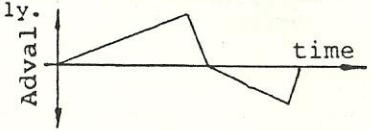
*PLONK (<data loc>) (<code loc>)
This command gives the user the ability to put the key definitions and a small lump of machine code needed by the joystick anywhere in memory, thus giving him a chance to keep it out of the way of the game being played. Just using the command '*PLONK' on its own will plonk the data at &0160 and the code just after it. Giving a 'data loc' will put the data there with the code immediately after it, while giving both a 'data loc' and a 'code loc' will put both items in the specified locations. We will be producing a list of PLONK LOCATIONS very shortly To aid the speed at which compilation will occur we would very much like to hear from users with successfull locations.

*PROP (<type>) (<speed>)
This command helps '*ADVAL' produce something which will appear to act more like a proportional joystick than a

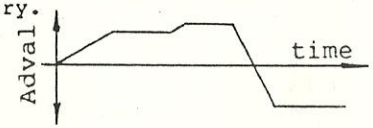
switched type. Moving the stick say, right will appear to the machine as if the stick is being moved to the right gradually as opposed to a sudden jerk as with '*NPROP'. The <speed> parameter affects the speed at which the joystick appears to move. The larger the number, the quicker (and jerkier) the movement. The ideal speed for any particular program will have to be found by trial and error; the default is 2. The 'type's affect what happens when the joystick is left central. (As left-right and up-down movements of the joystick are totally independant, holding the joystick directly downwards will appear central in the left-right direction etc.) The three available types are shown below (the default is two).

0 As 2 (see below).

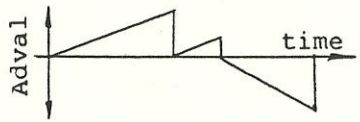
1Leaving the joystick central will make it appear to move to the centre gradually.



2Leaving the joystick central will make it appear that the joystick is stationary.



3Leaving the joystick central will make the joystick appear to jump immediately to the centre position.



This command only takes effect when the '*ADVAL' command is used. A simple program to demonstrate the effect of *PROP is shown in APPENDIX 2.

*REPEAT
Turns on the repeat function of the fire button on the joystick. Having given this command, the fire button will 'auto-repeat' when it is pressed to give very rapid fire on most games.

*REPLICA
Turns on 'REPLICA' mode. This will enable any game which can be played from tape, to be played after upgrading to disks and using 'Clare's Replica'. The method being to set up the keys or mappings etc. as normal, type '*REPLICA' and boot the Replica disk in the normal way. Replica should then run as normal and the

required game can be selected and run with the StarStick.

*RESET
Has the same action as '*NMAP' and '*NSETSTICK', but calls the REVIVE function and also resets the REPEAT, ADVAL and SNEAKY functions.

*REVIVE (<ROM number>/<ROM name>)
Revives a previously 'KILL'ed ROM. NB. This command will not take effect until BREAK has been pressed.

*SCRAMBLE
Invokes the pre-defined set of key definitions as shown in the table below (fig. 1).

*SETSTICK
Prompts for the keys to be represented by each position of the joystick. Just press the key required when asked. NB. There are two keys requested for 'Fire' to allow for things such as both 'bombing' and 'shooting' in games such as the Scramble derivatives.

*SNEAKY
This has no immediate effect but allows the StarStick to be turned on using '*DISK' or '*DISC' which should allow some disk based games to be played using the StarStick. The method is to set the StarStick up as you would like it, type '*SNEAKY', and 'BOOT' the disk containing the game. If you're lucky, the game will operate by first resetting all the vectors, then executing '*DISK', hence turning the StarStick on and replacing the necessary vectors. NB. The '*DISK' has its normal effect as well.

*STICK
Turns the Joystick functions on. NB. This command is automatically executed at the end of some of the other commands.

Pre-defined key definitions (fig. 1)

	Left	Right	Up	Down	Fire & Left	Right	Fire & U	Down	Firel	Fire2
ACORN	Z	X	*	?	Z	X	D	F	Space	Return
ACORN 2	Caps	Ctrl	Shift						Space	Return
ACORN 3	Z	X	*	?	Z	X	*	?	Space	]
CURSOR	Left	Right	Up	Down	Left	Right	Up	Down	Space	Return
FELIX		Down	A	Z		Down	A	Z	Space	Up
4CRAMBLE	Space	Shift	A	Z	Space	Shift	A	Z	Tab	Return

Some 'more difficult' programs.

Some software is 'difficult',in that it uses workspace or special methods around which it is diffult to twist a

joystick. Some of the offenders have been dealt with, the major ones being Replica, Aviator and Elite. The method of running these pieces of software and the limitations imposed are described below: NB. The methods described will only work on a disk-based system.

*Replica
This 'Tape to disk' utility includes some software which removes ROMs as part of its protection. To combat this and use the StarStick on games transferred to disk using this program, first set up the keys in whatever way you like, turn the StarStick off (*NSTICK) and enter the command '*REPLICA' ('*RE.' will generally suffice) and 'boot' the disk with SHIFT-BREAK in the normal way.

*Aviator
Aviator uses a lot of memory, and thus the relocatable code has to be moved slightly in order that the game functions correctly. Thus we suggest that you use the following command summary;-

*PLONK 168 141
*ADVAL 1
*PROP 2,4
*SNEAKY
Then BOOT the disc.

*Elite
This was a nasty one. To run it use the following command summary;-
*ADVAL 1
*PROP 3,16 Or something similar or miss out this line
*SNEAKY
*ELITE
Boot the disk in the normal way with
SHIFT-BREAK. The game will not start up using joysticks by pressing fire when prompted, but must be selected using the pause facility. Press '<COPY>K<DELETE>' making sure that you press <DELETE> firmly. You should now be able to select hyperspace coordinates and fly using the StarStick joystick.

Other Acornsoft games

Due to the method in which Acorn protect most of their games disks, the joystick has a problem in getting around it and tends to get turned off. To circumvent this problem, the command '*SNEAKY' has been developed which turns the StarStick off until after the protection has finished operating on the program.To play most Acornsoft's disk-based games; set the keys up as you would like and enter '*SNEAKY', then 'boot' the disk as normal. The StarStick should turn on and operate as expected.

Conventional Games.

Protection varies from game to game as does its memory usage. Thus it will be necessary to use the PLONK command from time to time. The system for use with a conventional program is as follows;-

*STICK
*PLONK XXX YYY [Only use if necessary].
*ACORN [or use *SETSTICK at this point].
CHAIN "SNAPPER" (From Tape) OR BOOT program from disc.

Where XXX and YYY are PLONK locations.

Technical information.

Errors and Error Messages

Number Message

128 Bad joystick number
The parameter to a '*ADVAL' command has been given outside the range 0 to 3.

129 Bad plonk
An attempt has been made to plonk either the data area, code area or both into ROM space.

130 No such ROM
A '*KILL' or '*REVIVE' command has been given with either a number outside the range of 0 to 15, or the name of a ROM which can't be found in the machine.

131 Work area corrupted
Something has happened to corrupt the StarStick's work area. There is little that you can do about this, unless it is you who is responsible for the corruption, in which case see the 'Memory usage' section.

132 Data area corrupted
Something has happened to corrupt the data area. This is the data which is positioned with the first parameter of the '*PLONK' command. '*PLONK'ing somewhere else

might cure the problem.

133 Bad proportional type
The second parameter to the '*PROP' command has been given outside the range of 0 to 3.

134 Bad proportional speed
The second parameter to the '*PROP' command has been given outside the range of 0 to 31.

Memory usage

The memory usage of the ROM is split into three distinct sections; The 'work area', the 'data area' and the 'code area'. Each of these is described below.

The Work area

This is actually spread around the machine a little:

&183 This is a checksum on the rest of the work area. It is obtained by exclusive-oring the rest of the bytes (Except the data-pointer copy held in &28A and &28B) together and exculsive-oring the result with 77.

&184 CODV - This points directly at the 'Code area' and is set using '*PLONK'.

&186 CODV2 - This points to the second half of the code area and is also (indirectly) set using '*PLONK'.

&188 SSBYTEV - When the StarStick is activated, it takes over 'BYTEV', this is the old value.

&18A SSRDCHV - When the StarStick is activated, it takes over 'RDCHV', this is the old value.

&F8 DATV - This points directly to the 'Data area' and is set using '*PLONK'. (See &28A below).

&28A DATV2 - This is a copy of DATV, which is necessary as DATV gets overwritten by the Operating System when BREAK is hit.

The Data area

This area holds the information which is '*KLOAD'ed and '*KSAVE'ed.

Offset Explanation
0 - 9 Each of these locations corresponds to one of the mapping positions. The three possibilities are:

0 Nothing

1 - 127 A mapping. The actual number is the internal code of the first key. 128 - 255 A joystick mapping. The actual number is the negative inkey value found on page 275 of the user guide.

10 - 19 Each of these locations corresponds to one of the mapping positions as for 0 - 9. In this case, if the slot is a key mapping, the location holds the negative inkey code of the second key, otherwise, for a joystick mapping, it contains the ASCII code of the key.

21 ENADV - This byte has bit 7 (negative) set if Adval is enabled. The bottom two bits hold the joystick number (1 - 3).

22 AUREP - This byte is negative if Auto-Repeat mode is enabled.

23 DISCAT - This byte has bit 7 set if Sneaky mode is enabled, and bit 6 set if 'Replica catch' is on.

24 AUTF - This is a flag used with Auto-repeat.

25 - 26 DEAD - These two bytes contain one bit for each ROM. The first byte holds the bits for ROMs 0 - 7, the second for ROMs 8 - 15. If the bit is set, the ROM is disabled.

27 RACT - This byte contains &FF if the Starstick is active (On), and &00 otherwise.

28 PTYP - The bottom two bits of this byte hold the proportional type, the upper 6 bits hold the speed.

29 DCHK - This is the checksum for the data area. It is calculated by exclusive-oring all the previous bytes (0 - 29) together then exclusive-oting the result with 52.

30 TLIGHTS - This is a temporary location used to help keep the caps lock and shift lock lights under control.

31 LASTKEY - This is used to store the last value read from the joystick port.

32 XPOS - This holds the high byte of the X-position of the 'pseudo analogue joystick' which is simulated using proportional mode.

33 YPOS - This holds the high byte of the Y-position of the 'pseudo analogue joystick' which is simulated using proportional mode.

34 ELITQ - This byte contains &FF if the 'Elite

catch' is on, otherwise it holds &00.

The Code area

This contains some code used to communicate with the ROM. BYTEV and RDCHV are redirected to look here when the joystick is activated. The code is as follows:

```
.IRDCH LDA #90        / New OSBYTE code for Read Character
.IBYTE STA &EF        / Store acc. in OSBYTE location
       LDA   &F4      / Load present ROM number
       PHA            / Save it
       LDA   #romno   / Load ROM number of StarStick ROM
       STA   &F4      / Place in OS space
       STA   &FE30    / Store ROM number in ROMSEL
       JMP   DoByteRdCh / Jump into the ROM
.Comeback    PLA       / Pull back the old ROM number
       STA   &F4      / Store in OS space
       STA   &FE30    / Store it in ROMSEL
       LDA   &EF      / Get what Acc should be
       RTS            / And return.
```

RDCHV is made to point at 'IRDCH', BYTEV points at 'IBYTE'.

Running Acornsoft and PLONK VALUES

```
Acornsoft Monsters              *ACORN <CR>
(for disc version only add)     *SNEAKY <CR>
                  ----          CHAIN"" <CR>

Acornsoft Maze                  *PLONK 880 <CR>
                                *ADVAL 1 <CR>
(for disc version only add)     *SNEAKY <CR>
                  ----          CHAIN"" <CR>

Acornsoft S/S Command           *ADVAL 1 <CR>
(for disc version only add)     *SNEAKY <CR>
                  ----          CHAIN"" <CR>

Acornsoft Crazy Tracer          *ADVAL 1 <CR>
(for disc version only add)     *SNEAKY <CR>
                  ----          CHAIN"" <CR>

Acornsoft Snapper               *ADVAL 1 <CR>
(for disc version only add)     *SNEAKY <CR>
                                CHAIN"" <CR>

Acornsoft Snooker               *SETSTICK <CR>
                      Left=Z  Right=X Up=*     Down=?
                      Fire & Left=S   Fire & Right=S
                      Fire & Up  =T   Fire & Down =B
                      Fire 1     =F9  Fire 2      =F9
(for disc version only add)     *SNEAKY <CR>
                                CHAIN"" <CR>

Acornsoft Hopper                *ADVAL 1 <CR>
(for disc version only add)     *SNEAKY <CR>
                                CHAIN "" <CR>
Acornsoft Missile Base          *SETSTICK <CR>
                      Left=J  Right=L Up=I     Down=,
                      Fire & Left=J   Fire & Right=L
                      Fire & Up  =I   Fire & Down =,
                      Fire 1     =X   Fire 2      =X
(for disc version only add)     *SNEAKY <CR>
                                CHAIN"" <CR>

Acornsoft Firebug               *ADVAL 1 <CR>
(for disc version only add)     *SNEAKY <CR>
                                CHAIN "" <CR>

Acornsoft Volcano               *ADVAL 1 <CR>
(for disc version only add)     *SNEAKY <CR>
                                CHAIN "" <CR>

Acornsoft Tetra Pod             *ADVAL 1 <CR>
(for disc version only add)     *SNEAKY <CR>
                                CHAIN "" <CR>
```

Appendix 1 Fitting Instructions.

Place the BBC Computer on the work-surface in front of you, with the keyboard facing you. Lift the front of the computer and locate the two 'X' headed screws marked "FIX". Remove them and store them in a safe place. Locate the two screws at the back of the computer near the lid, once again they are of the "X" headed type. Remove these and again store them safely. The lid should now lift off easily.

Positioned centrally at the left and right hand ends of the keyboard are two nuts. Remove these and the bolts that previously secured the keyboard to the case. centrally

Fold the keyboard back onto the rear of the computer hinging it on the ribbon cable, OR, pull the right-hand edge of the keyboard VERY GENTLY towards you untill the Sideways Rom sockets shown in the diagram below are exposed.

Locate the five 28 pin sockets marked Ic's 51, 52, 88, 100, and 101.

IC 51 CONTAINS THE OPERATING SYSTEM WHICH MUST;-

A - NOT BE REMOVED.

B - BE OF ISSUE 1.2 or HIGHER.

IC 52 should contain any other ROMS NOT supplied with the computer NOT the Starstick Rom. If you have no ROM to fit here leave it empty.

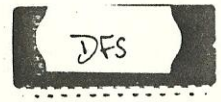
IC 88 should have the BASIC ROM fitted which is usually marked;

BASIC I

BASIC II

One of these ROMS will have been fitted to your computer depending on the date of manufacture.

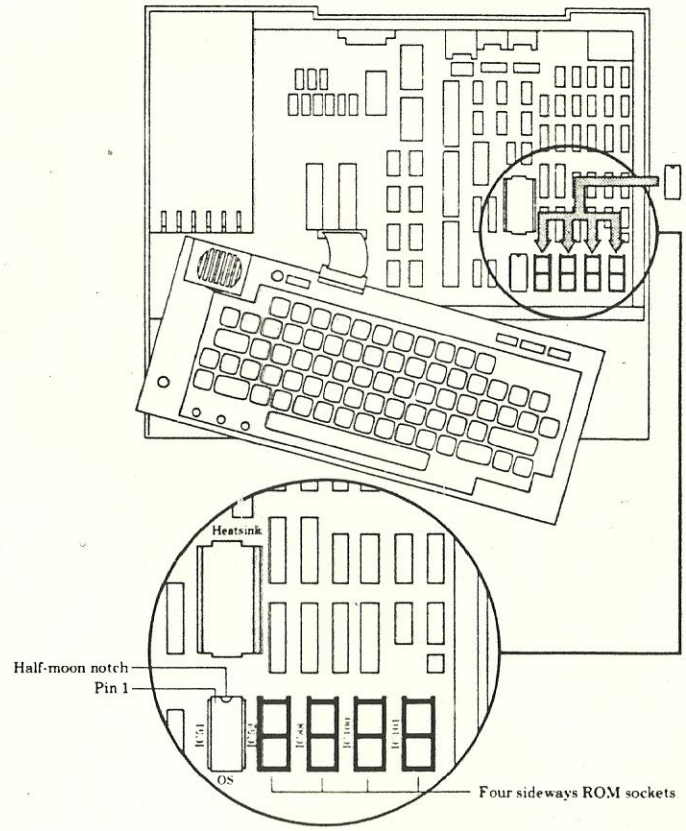
IC 100 should have the DFS or DNFS ROM fitted (if yours is a disc based computer) which should be marked;-



0.90 DFS DNFS

Once again one of these ROMS will have been fitted depending on date of manufacture.

The Starstick ROM MUST BE FITTED into IC 101, it will not function in any other socket.



Program	Plonk Values L	H	Preset ?