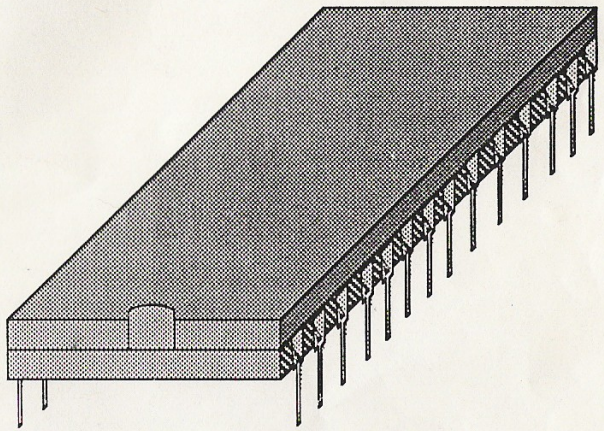
SIDEWAYS RAM UTILITIES



BRAINSOFT

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1. INTRODUCTION

1.1 ITEMS SUPPLIED

The following items come with this package.

a) The sideways ram utilities disk.

b) Instruction book.

1.2 CONVERTING TO 80 TRACK

There is a program on the disk which copies the programs to a 80 track disk. To achieve this
(a) Insert disk.
(b) If switchable switch to 80 track.
(c) Type CHAIN "80" <RETURN>

1.3 GETTING STARTED

Insert the utilities disk into drive 0 and BOOT as follows:

Press <SHIFT>
Press <BREAK>
Release <BREAK>
Release <SHIFT>

The utilities will now automatically load and run displaying the menu screen. A function is "selected" by pressing the space key thus moving the inverting bar down the menu, and selecting via pressing return.

1.4 INTRODUCTION

This package was designed as a low cost introduction to sideways ram, the programmers utilities provided are orientated towards sideways ram, giving advanced rom managment and viewing facilities.

1.5 PROGRAM COMPATIBILITY

We have tried and tested sideways utitilites on the following:

BBC A (32K ram and sideways rom register)
BBC B
BBC B+ (shadow mode off)
BBC master
ACORN DFS 0.9
ACORN DNFS 1.2
BASIC 2

This package cannot be guaranteed to work with rom boards or anything which didn't come with your beeb at purchase.

2 DISC MENU AND PROGRAMS

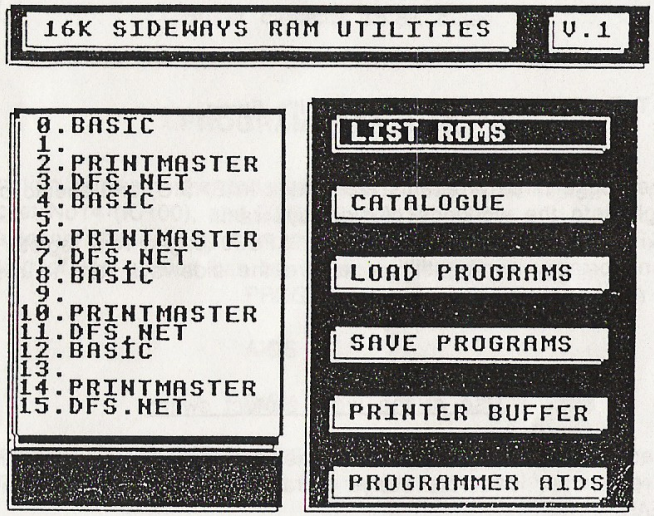


fig 1 The menu screen.

The disk provided contains a menu program which allows several programs on the disk to be selected. To use the menu insert the utilities disk into drive 0 and press SHIFT+BREAK.
Use space to outline the selected function and press return, this will execute the function.
The functions are detailed below:

LIST ROMS List the roms present in the BBC by socket and name.

CATALOGUE Displays the catalogue from disc.

LOAD PROG Loads a rom image on file to a sideways ram socket.

SAVE PROG Save a specified rom image to file. (NOTE normal rom length = &4000)

PRINTER Loads a 15.8K printer buffer into sideways ram.

PROG AIDS Loads programmers utilities into sideways ram.

also provided on the disk are several extra programs:

ROMSAVE Saves a specified rom image to file.(NOTE normal rom length =&4000)

ROMLOAD Loads a rom image on file to a sideways ram socket.

ROMTEST To test sideways ram after it's fitting.

NOTE: The above three programs are written in BASIC, and should provide some insight into the workings of sideways ram.
Location &F4=present paged rom number, &FE30=paged rom register.
To function correctly some utilities require the sideways ram to reside in the rightmost rom socket(IC101).

Use of the write protect switch

This is used to load "protected" rom images into sideways ram, to use set switch to read/write, load rom image to ram, set switch to read only, press CTRL+BREAK.

3.PRINTER BUFFER

This program provides the user with an extra 15.8K of buffer space, which allows you to continue using the computer whilst the printer is still printing.
To install select printer buffer from the menu and check it's presence in the romlist, then press CTRL+BREAK.
Type *HELP to confirm it's presence among the rom titles, the buffer has been tested with **WORDWISE-PLUS**, and CTRL+B with BASIC programs with no faults.
The buffer will be cleared by pressing break as normal.
HOW IT WORKS: Each vector has a number n existing a location &200+2*n, the vectors used are the buffer remove vector(n=21), the buffer insert vector(n=22), and the buffer count/purge vector (n=23)
These are used to make the sideways ram an extension to the BBC's built in buffers.

SPECIFICATION
Program length 436 bytes.
Load address &8000.
Buffer capacity 15.8K bytes.

4.PROGRAMMERS UTILITIES

To function correctly the programmers utilities must reside in the sideways rom socket No14 (IC100), and BASIC in No15.
After selection of the utility from the menu and a CTRL+BREAk, the functioning of the utilities can be tested by *HELP on which.

PROGAIDS

AIDS

DISK

Should appear, also try *HELP AIDS and *HELP DISK.
The commands provide the following functions:

***BEEP** <FREQ> <LENGTH>, eg, ***BEEP** 123 12
Changes the sound of the bell, used to demonstrate the effect of *FX123, *FX124.
HOW IT WORKS: ?&265=FREQ, ?&266=LENGTH.

***CLEAR**
Unlike the BASIC clear it clears all variables, including the resident integer variables.

HOW IT WORKS: Zero's locations &404 to &4F5, and sets VARTOP & LOMEM to TOP.
NOTE: &400-&46B contain the resident integer variables @% to Z%, &480-&4F5 contain the variable pointer table.

***CURSOR** ON/OFF, eg. **CURSOR ON**
Turns the text cursor off or on.

HOW IT WORKS: VDU 23,1,0;0;0;0; turn's the cursor off, whilst VDU 23,1,1;0;0;0; will turn it back on.

***MONITOR** A ram editor.

It has the following controls:

Up/Down cursor keys, moves the cursor through memory at 8 byte intervals.

Left/Right cursor keys, move the cursor through memory a byte at a time.

SHIFT+Up/Down cursor keys, move the cursor through memory at 128 byte intervals.

f0 Moves the cursor to any location (HEX) in memory.

f1 Selects which sideways rom contents is to be viewed.

f2 Is a printer dump option, printing the contents of memory from alow address to a high one.

f9 Escape from the monitor.

On screen editing is by moving the cursor to a location, entering the new hex value and then pressing return.

***MOVE** <LOCATION>, eg. ***MOVE** 0E00

Moves a BASIC program and resets PAGE & TOP to their new values, useful for loading tape based programs off disk.

***PACK**

Removes rems, spaces and blank lines in an intelligent way to save on memory usage, also resets values LOMEM, TOP and VARTOP.

***RETRIEVE**

Retrieves a corrupted or bad program into a listable or runable form.

***RLIST**

Lists the roms by socket, rom type and name, rom type=00 means rom is switched off.
bit7 of type, Indicates the rom has a service entry.
bit6 of type, Indicates the rom has a language entry.
bit5 of type, Indicates a 2nd processor relocation address.

***ROFF**, eg. ***ROFF** 14

Turns off a specific rom.
HOW IT WORKS: ?(673+n)=0

***RON**, eg. ***RON** 14

Turns on a specific rom after deselection, used with ROFF to avoid command clashes.
HOW IT WORKS: ?(673+n)=Rom type

***RSTATUS**, eg. ***RSTATUS** 14
Gives detailed information about the selected sideways rom.
HOW IT WORKS: uses OSRDRM(&FFB9) to read ROM header.
&8000-&8002 JMP lang entry.
&8003-&8005 JMP service entry.
&8006 Type of rom.
&8007 Copyright offset(coff%)
&8008 Rom version no(binary).
&8009 Rom title string.
rom version string preceeded by 0.
&8000+coff% copyright string, starting with "(C)".

***SOUND ON/OFF**, eg. ***SOUND OFF**

Turns the sound on or off, use to demonstrate the effect of *FX210.
HOW IT WORKS: ?&262=0 for sound on, whilst ?&262=1 turns sound off.

***SPEED (0-255)**,eg. ***SPEED 0**

Used to vary the speed of basic programs, pressing any key will also slow the program down.
HOW IT WORKS: Uses buffer insert indirection vector, to junp to a delay loop.

***STATUS**

Gives information on the memory usage by a BASIC program.
HOW IT WORKS: Prints out the values of certain locations used by basic.

HIMEM = &06, &07
VARTOP=&03, &02
LOMEM =&01, &00
TOP =&12, &13
PAGE =&18
OSHWM =&FX &B4

***STRING <STR>**,eg. ***STRING "H":o%=25**
Searches a BASIC program for occurances of strings, numbers and symbols but not keywords.

***VARS**
Lists all currently active variables used by a BASIC program.
HOW IT WORKS:Uses the variable pointer table at &480-4F5 to find the names of all the presently active variables.NOTE this table is updated after each run.

***VECTORS**
Displays the name, address, contents and default status of the BBC's vectors. This is particulary useful in gaining an insight in the workings of a sideways rom, the hash indicates a difference with the default vectors.
HOW IT WORKS: List the contents from &200-&232 and compares with the default vector table(only in OS1.2 onwards), found from ?&FFB7, ?&FFB8.

***CLOSE**
Closes all open files and is equivalent to CLOSE £0.

***KEYLOAD <FSP>**,eg. ***KEYLOAD KEYS**
Loads the function key definitions from file.
HOW IT WORKS: Loads a file into the soft key buffer residing at &B00-&BFF.

***KEYSAVE <FSP>**,eg. ***KEYSAVE KEYS**
Saves user-defined keys to a file.
HOW IT WORKS:Saves the contents of the soft key buffer onto a file.

***RSAVE <No.> <FSP>**,eg. ***RSAVE 13 BASIC**
Saves a specified rom image to file.
HOW IT WORKS: Using OSRDRM it saves the contents of a selected rom to file.

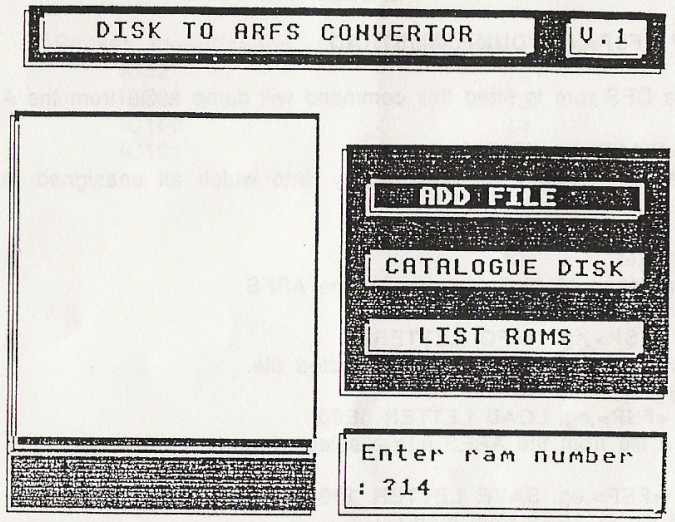
***SCREENLOAD <FSP>**, eg. ***SCREENLOAD JACK**
Unpacks and displays a packed file from disk.
HOW IT WORKS: see SCREENSAVE.

***SCREENSAVE <FSP>**,eg. ***SCREENSAVE JACK**
Compacts the screen display (any mode) onto file, in most cases this will save file space.
How it works: converts the screen into the following format <value of byte> <No of concurrent bytes>, eg. 253,255,0,3 is 255 bytes of value 253 followed by 3 bytes of value 0.

***VERIFY <FSP>**,eg. ***VERIFY MYPROG**
Verify's a BASIC program in memory with one held on file.

5.ADVANCED RAM FILING SYSTEM

This program provides the user with a ram disk, it allows you to set PAGE to &0E00 and have fast access to programs.
It can only work with sideways rams of 16K in length, when writing software make backups to disk.
To load the filing system into the BBC type CHAIN "ARFS" <RETURN>, the ARFS screen shall now appear (fig 2).



To use the ARFS convertor type a socket number containing ram and press return, use the ADDFILE function to load files to the ramdisk.
When all 16K of ram is used, the program will prompt for another ram number, if all available sidways ram has been used type -1(This will delete the file being loaded). When the user is satisfied that all required files are loaded into sideways ram, hit BREAK.
To enable the ARFS type ***RFS** <RETURN>, when enabled the commands provided for the ARFS are:

***ADDROM** <No>,eg. ***ADDROM E**
Adds another 16K of sideways ram to the filing system, the number is the extra rams socket number.

*CAT, eg. *.

Lists the files and directories present in the ARFS, with the free/used memory.

*DELETE <FSP>,eg. *DELETE ZX81

Removes the specified file from the ARFS, this command compacts the rest of the the ram for maximum storage.

*DUMP <FSP>,eg. *DUMP AMSTRAD

When a DFS rom is fitted this command will dump a file from the ARFS.

*DIR <CHAR>, eg.*DIR $
Selects the currently active directory, into which all unasigned files are placed.

*HELPRAM
Gives a listing of available ram for the ARFS.

*INFO <FSP>,eg. *INFO LETTER
Displays load parameters for a selected file.

LOAD <FSP>,eg. LOAD LETTER 0E00
Loads a file from the ARFS into a selected memory area.

SAVE <FSP>,eg. SAVE LETTER 1900 2000
Save a file to ARFS from memory.

To deselect the ARFS type *DISK, the commands available when the ARFS is deselected are:

*RFSLOAD <FSP>,eg. *RFSLOAD PROJECT
Loads a set of files in ARFS format into ARFS from disk.*WARNING* this will completely destroy any existing files in ARFS.

*RFSAVE <FSP>,eg. *RFSAVE PROJECT
Saves the files in ARFS format from the ARFS to disk.

BRAINSOFT cannot accept any liability for any files or programs lost due to the ARFS, it is in the users interest to make backups to disk.

5.APPENDIX

5.1 FINDING THE SOCKET NUMBER.
The rom socket system on the standard BBC B, has four sockets numbered from 12 to 15, this number refers to the roms priority in the BBC, the higher it's socket number the higher the priority of the rom.
The sideways ram module should reside in socket number 14, and BASIC in socket 15 for the utilities to function correctly, sockets are identified by white numerals on the BBC's circuit board.

Socket identification	Socket number
IC52	12
IC58	13
IC100	14
IC101	15

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