The Authur
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SC_PD3 first version September 1990 latest ver March 1992.

SC_PD3 is a compilation of my smaller utilities SC_PDI and SC_PD2 as well as new programs combined into one.

This also included for the first time a program that I did not write Humphrey a disc map info program, the only other program I sold was Simon Owens TurboMon which is now embedded within Sim Coupe.

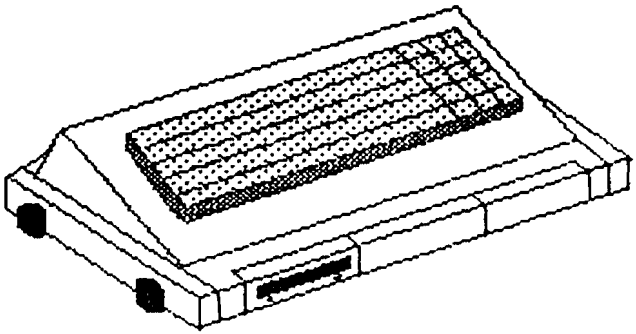
This was also my only public domain Disc set, Zodiac a paper based magazine was one who also sold it.

For Spectrum fans SC_SPECLONE was added this had features like recognising all the Spectrum keys on the Sam Coupe as well as jumping from Spectrum to Sam Basic for saving files for instance to disc, as well as snapshot plus D files loading.

S J Nutting STEVES SOFTWARE April 1990 - January 1996

SC_PD3

Powerful Machine code Utility Software
FOR THE SAM COUPE 256/512K COMPUTER



SC_SPECLONE	Spectrum 48K Emulator
SC_COMPRESSOR 1	Fast Screen and Code
SC_COMPRESSOR 2	Screen Cruncher
SC_DISCLONE	Exact Disc Copier
HUMPHREY	Disc Directory Util

by S.J.NUTTING

STEVES SOFTWARE

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PUBLIC DOMAIN SOFTWARE

SC_PD3 is a compilation of SC_PD1 and SC_PD2 with an extra bonus utility SC_DISCLONE.
There are two seperate Manuals for SC_SPECLONE and HUMPHREY (the only program that I did not write, its by Matthew Halt of Manic Minor).

On Disc are the following files :-

```
 1 samdos2      17 C 491529,8192
 2 SCSPECLONE    7 BASIC      1      -load this for SC_SPECLONE
 3 trans         2 C  30000,925
 4 SPECLONE2     6 BASIC  9500
 5 high          1 C  65500,30
 6 low           1 C  30000,189
 7 H3     .3    23 BASIC  5000      -load this for HUMPHREY
 8 H2     .C     1 C  16384,300
 9 scompress     5 BASIC  9000      -load this for SC_COMPRESSOR 1
10 compcode      2 C  31882,630
11 sc_comp       9 BASIC    10      -load this for SC_COMPRESSOR 2
12 sc_compcd     9 C  29300,4340
13 sc_uncomp     1 C  16384,430
14 scdisclone   17 BASIC 65250      -load this for SC_DISCLONE
15 disclonecd    2 C  32768,1000
16 tracksou      1 C 471556,54
17 tracksou A    8 C  98304,3806
18 DEMO          all other files    after are DEMOS of all my Software.
```

SC_SPECLONE, HUMPHREY and the tracksou Source files are freely available to anyone, incl Disc Magazines, The 2 SC_COMPRESSORS can be used, but only the uncompress routines not the programs to enable users to compress screen$. SC_DISCLONE needs special permission if you would like to use it.
The only condition to the use of my PD programs is that I get a mention somewhere in the Credits.

SC_COMPRESSOR 1

This utility will compress Mode 3 or 4 Screen$
and 16K Ram code blocks.

Like many people I collect quite a bit of Public Domain Discs, many containing some or a complete Disc of Screen$, It's possible to only have upto 32 Screen$ per Disc, with SC_COMPRESSOR 1 you can generally save twice as many Screen$ compressed onto one Disc, thereby having a Library of Screen$ collected together The amount of compression saving on a Screen depends on how complex and detailed a Screen is, Simple Cartoon Screen$ crunch down by about 80%, Digitised detailed Screen$ by 20%, most others vary from 30-60%.

On the Disc are two files:-

scompress 5 BASIC 9000

compcode 2 C 31882,630

Load in scompress, this samll Basic program will Compress and Uncompress Screen$ to Disc. A simple Menu appears. Pressing key C will prompt you for a Screen$ file to load in (Pressing RETURN will do a DIRECTORY of the Disc,key M for Menu) Once a file is Loaded in it will be compressed and then the number of bytes the screen has been compresed by (25000 bytes is the normal length of a screen$), then the percentage saving out of 100% is then shown.

Next you will be prompted for the filename to save the compressed Screen to Disc ,dont worry about the corrupted looking screen as it's saved to Disc this is normal. Pressing key M will take you back to the Menu, whereby pressing key U will Uncompress a Screen from Disc.

For those who would like to know the technical bits about the compressor,read on. The filename "compcode" 31882,630 is the routine that does all the work it occupies memory location 31882 to 32511, although the routine uses a buffer from 32512-32767, so make sure that the Ramtop CLEAR address is 31881 or lower.

First of all there is a poke to place in the machine code routine if your Coupe is a 256K Machine then:-

POKE 31895,14 (512K Sam POKE 31895,30).

To Compress a Screen do the following :-

LOAD "scr1" SCREEN$: CALL 31882: IF PEEK 31894=1 THEN STOP: ELSE SAVE "scr2" CODE 507904+DPEEK 31897,DPEEK 31899

Note"scr1" is the Screen$ filename you would like to compress
"scr2" is the Compressed Screen$ filename to save to Disc
PEEK 31894 is the Flag to say if the Screen can be compressed or not
But alter 507904 to 245760 if you are using a 256K Sam

To Uncompress the Screen just type:-

LOAD "scr2" CODE: CALL 31885.

To Compress a 16K RAM block of Machinecode POKE 31896 with the RAM page number and then CALL 31888, If PEEK 31894=1 then that Ram block could not be compresed, if compression was sucessful (PEEK 31894=0) you can then save the compressed file to Disc as:- SAVE "filename" CODE PEEK (1+PEEK 31896)*16384+DPEEK 31987,DPEEK 31899.

To Uncompress the RAM block POKE 31896 with the Ram page, and then CALL 31891.

SC_COMPRESSOR 2

This is a more powerful Screen Compressor than SC_COMPRESSOR 1, with an easier set up, automatic uncompressing of screen$ upon loading plus the ability to view a whole set of screen$ in memory, rather than load each individual screen to view from Disc.

SC_COMPRESSOR 1 can compress most screen$, but not the palette lines, uncompressing is very fast, and compresses to the equivalent of MasterBasic SAVE MODE 3.

SC_COMPRESSOR 2 on the other hand will compress all types of Screen designs with Palette lines, uncompresses slower to the current screen address, but compresses screen$ around 15% better than SC_COMPRESSOR 1

To give you an idear of how much screen$ are compressed down to using SC_COMPRESSOR 2 see below :-

Complex Digitised Screen$ compress down by about 40%
Simple Cartoon " " " " " 90%
Other types of " " " " " 55%

NOTE SC_COMPRESSOR 2 works with only SAMDOS and MASTERDOS.

On Disc are 3 files:-

```
sc_comp      9 BASIC  10
sc_compcd    9 C  29330,4340
sc_uncomp    1 C  16384,430
```

Load in "sc_comp" to compress some screen$

You are then prompted to input a Ram page number from 1 to 27 for the start of the 32K workspace needed as a temporary area.
For a 256K Sam an ideal Ram page number is 11 (512K 27).
Once done you should now be on the main menu.

Pressing key 1 will compress just one screen, so when you load it in from Disc or Ram Disc the compressed screen will automatically uncompress to current screen.

Pressing key 2 will compress as many screen in memory as possible and save out the set of screen$ as one file, ideal for slideshows.

So lets try compressing just one screen for the moment to get an idear of how thing work, Press key 1.

You will now be prompted for the filename of the screen you would like to compress, can use syntax like "d3:screen" to load screen from Ram Disc 3 for example.

Next the Ram page of where you would like the screen to compress to, e.g type 1, this will store the screen at address 32768, a popular place to put machine code.
(also see table on page 4 on Ram page and addresses).

Once done the screen will load in Sams screen memory and start compressing, dont worry about the wierd coloured lines that scroll down the screen, this is normal.

After about 30-60 secounds you will see the address of where the compressed screen stats and ends as well as the number of bytes the whole crunched down screen used up.

Then you will be prompted for the filename for the compressed screen file to save to disc, Once done you should be back to the main menu again.

Now press the ESC key, to drop back to basic, now load in the compressed screen just saved out to disc by LOAD "filename" CODE.

The file will load in and uncompress in the correct screen Mode 3 or 4 and to the correct screen area of either 256/512K Sam.

Note no other files need to be loaded or any CALL addresses to be used,everything is done automatically, but when the screen uncompresses it will use a small area in the system heap from 16384 to 17133.

Going back to the main menu, Pressing key 2 will enable you to compress a whole set of screen$ from disc into memory.

First you will need to input the start address of where you like the set of screen$ to be stored from, 32768 is the lowest address.

Next the end address of where the screen$ can store upto, if you choosen the Ram page temporary storage area earlier in the set up of the program (i.e 11 on 256K, 27 on 512K). Then the maximum address to store screen$ would be 196607 on 256K Sam and 458751 on a 512K, this would give you upto 160K on a 256 and 416K on a 512K Sam to store screen$ in.

Now input the Drive no 1-7 you would like the screen to load from or enter 0 for a Dir of Disc.

Next input the screen filename to compress.

(type q as a filename, if you do not want to compress any more screen$

(press RETURN will bring you on to 2 more inputs the first is the Program number start of the first screen to compress and the secound input as the last program number of the last screen to compress, this is very useful if you have a disc full of screen$ one after the other, you can then make yourself a cup of coffee while each screen is automatically loaded from disc and compressed.

Each screen is compressed one after the other in memory starting from the address you defined earlier upto as much memory as possible, once all screen$ have been done, a display of each individual screen start address is shown, note down the addresses you will need it later on.

Pressing a key will allow you to view all screen$ in memory with how many bytes it used up and the percentage savings.

Once you have viewed alll screen$ you will be asked the filename for the block of screen$ to be saved out to disc.

Now to uncompress the block of screen$ in your own program as a sort of slideshow follow the below :-

First you need to CLEAR 32767: LOAD "sc_uncomp" CODE and also the block of compressed screen$.

Some variables need to be set up:-

```
LET  r=a temporary ram page storage area such as 11 or 27
LET rr=(r+1)*16384: POKE 16385,r
LET  s=the address of the screen you want to compress
POKE rr,mem$ (s to s+30000): CALL 16384
```

The above will uncompress one screen, to uncompress all the screen$ see page 4 for a suitable program.

```
10 CLEAR 32767: LOAD "sc_uncomp" CODE: LOAD "filename" CODE
20 LET r=11 or 27: LET rr=(r+1)*16384: POKE 16385,r
30 FOR s=1 to the number of compressed screen$ in memory
40 READ d: POKE rr,mem$ (d to d+30000): CALL 16384
50 PAUSE: NEXT s: STOP
60 DATA 32768,38624,etc

filename is the compressed screen$ block of code
r        is the temporary Ram page storage area
s        is the FOR TO loop on how many screen$ to view
DATA     holds the start addresses for each compressed screen


Ram Pages and Addresses:-
0  16384   The system variables, SC_COMPRESSOR 2 program area
1  32768   The lowest area screen$ can start to be compressed
2  49152
3  65536
4  81920
5  98304
6  114688
7  131072
8  147458
9  163840
10 180224  The following ideal areas on a 256K Sam
11 196608  Ram buffer temporary storage area (2 Ram pages are used)
12 212992
13 229376  Samdos/Masterdos Disc Utility Area
14 245760  The screen display area part 1
15 262144   "      "       "       "     "  2
16 278528
17 294912
18 311296
19 327680
20 344064
21 360448
22 376832
23 393216
24 409600
25 425984
26 442368  The following ideal areas on a 512K Sam
27 458752  Ram buffer temporary storage area (2 Ram pages are used)
28 475136
29 491520  Samdos/Masterdos Disc Utility Area
30 507904  The screen display area part 1
31 524288   "      "       "       "     "  2
```

SC_DISCLONE

This Utility will copy a whole complete Disc even if the Disc is security protected with partly Formated Tracks,with non standard Tracks and sectors numbers and unformatted tracks. However Disclone cannot cope with non standard sectors which are not 512 bytes in length such as Prince of Persia which uses 5 sectors per Track, each sector being 1024 bytes long.

Why develope a copying Utility that copies protected Discs?

Well this is rather a controversial subject, most Utility software do not have any security, mainly because the Software has to be backed up onto another Disc, for various reasons. However a small number are protected which can be annoying, I know from all the letters I get. Games Software on the other hand do not need to be backed up as only one disc is needed to run the software, but from all the Disc magazines I read, I hear of so many people who just want a backup copy so that if anything goes wrong with the master they have the backup copy to play with, although you can send the master back to the publishers and they will make another copy, sometimes they will make a charge for this sevice, or the software company has gone down or does not sell the game anymore. This Utility was written by public demand.

LOAD "scdisclone", you should now see the computer configurations such as which Sam you have either a 256K or 512K. The number of drives 1 or 2, the Rom version number,the Dos you are using either Samdos, Masterdos or MasterBasic and whether you have a 1MB Ram interface. Next there is a selection of options from 1 to 5.

Option 4 toggles Normal/Fast format, when a disc is to be backed up onto another Disc and you would like load files from it, the loading time can be speeded up if the Disc was specially Formatted (Fast Format), or load in at the standard reliable speed (Normal Format).

Option 1 is the quickest way to backup a Disc this will copy a Disc with or without tracks being formatted and that the number of sectors to a track is 10 (for a sam) or 9 for a PC).

Option 2 is the next security backup if option 1 does not work, this takes quite sometime to backup, especially if there are many unformatted tracks.

Option 3 is for Discs that are heavily secured,and will guarantee that the disc can be fully backed up, this takes a very long time to do so.

Option 5 is for Discs that usually have protected Tracks 206/207 but other tracks are normal. So you can copy the Disc with COPY "d1:*" to "d2:*" or BACKUP "d1" to "d1" etc using basic then use option5 5 to copy the protected tracks 206/207, lerm use these tracks a lot.

The best computer set up to backup protected discs is with 2 drives, 512K Sam, If you have not got 2 drives a 1MB interafce would help a great deal, otherwise you will have to change the Discs around a few times. Disclone uses it's own Dos routines, if your intrested in them, LOAD in source file "tracksou" with SC_ASSEMBLER 512K, for the routines and info.

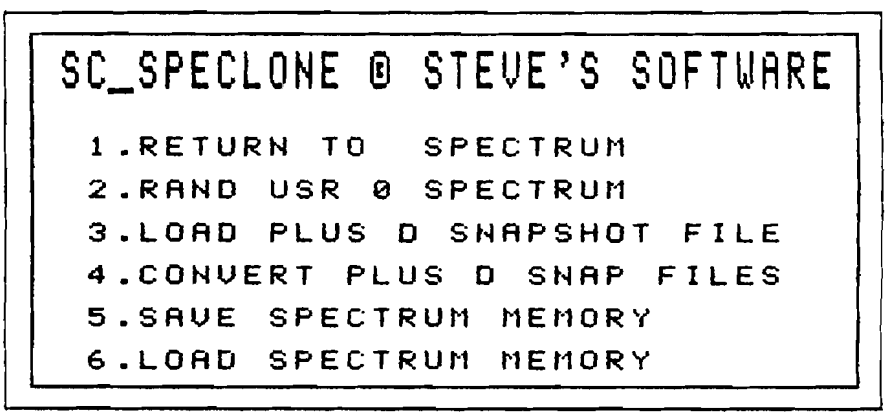
SC_Speclone

SC_Speclone is a bonus utility program supplied free with **SC_Assembler**. It allows a wide range of Spectrum 48K programs to run on Sam, even business and utility programs which use a printer.

Plus D disc snapshot files can be converted for use with Sam, and Spectrum 48K tape programs can be loaded and the whole Spectrum memory saved to disc to be re-loaded for future use. Only snapshots can be used from Plus D discs, not program files. So if you have a disc based Spectrum 48K program which you wish to use with Sam, and have no tape version, make a 48K snapshot using the Plus D. 128K programs and snapshots cannot be used with **SC_Speclone**.

Appendix 2 contains technical information about the working of this utility.

On loading, the program goes to the main menu, illustrated below.



Option 1
Return to Spectrum

Selecting this option will switch to Spectrum mode. If there is a Spectrum file in memory, this will be preserved.

In Spectrum mode
All keys are scanned, but the following Sam keys have special uses:

TAB Graphics mode - equivalent CS/9
CNTRL E-mode - equivalent CS/SS
ESC BREAK - equivalent CS/SPACE

FUNCTION KEYS 0-9 Keypad returning the digits 0-9
INV hash mark #

Printing from Spectrum mode
LPRINT sends ASCII characters to the printer, with tokens unexpanded. For example, LPRINT "Testing" will work. **LLIST** also sends only ASCII characters and unexpanded tokens, so it is not possible to LLIST a Spectrum program, because the keyword codes will not be converted to spell out the keywords.

Linefeeds
The program is set up to send a linefeed after each carriage return. If your printer already sends a linefeed automatically, the result will be permanent double line spacing. To correct this, the Spectrum ROM file on the **SC_Speclone** disc must be modified.
Reset Sam, after saving the Spectrum memory if necessary. Put the **SC_Speclone** disc in drive 1, and enter the following lines as direct commands

```
CLEAR 32767
LOAD "rom" CODE
POKE 80324,195
SAVE OVER "rom" CODE 65536,16384
```

Printing to #3
Most Spectrum utilities do not use LPRINT, but send the bytes to be printed to be output to #3 via a printer driver routine. **SC_Speclone** has a suitable printer driver at Spectrum addresses 14793-14826 (34 bytes) (Sam addresses 80329-80362). This routine should be copied to the address at which the Spectrum program's own printer driver routine resides, overwriting the program's routine.

Spectrum addresses from Sam BASIC
From Sam BASIC, all Spectrum addresses reside 65536 bytes higher than their normal Spectrum address. (See memory map in Appendix 2).

Switching to Sam from Spectrum mode
NEW
The Spectrum keyword NEW returns to Sam. If Spectrum address 23296 holds 0, the return will be to the main menu. If 23296 holds any other value, the return will be to Sam BASIC line 1000.

NMI button.
If the Spectrum program does not permit you to exit to BASIC, the NMI

button can be used to return to Sam BASIC, but Sam's NMI button has a fault which needs a hardware modification. It will exit to Sam BASIC, but you should not rely upon being able to return to the Spectrum program at the point from which you left it.

To NEW the Spectrum memory.
The keyword NEW cannot be used in the usual way, because it is used to switch to SAM mode.

PRINT USR 14888
Mimics NEW. BASIC programs are cleared from memory, but code stored above a CLEAR address is preserved.

PRINT USR 0
Resets Spectrum, clearing all programs and code from memory.

Saving and loading from Spectrum mode
In Spectrum mode, SAVE and LOAD will normally be to tape, and the program compensates automatically for tape loading speed. Disc and microdrive syntax are not accepted. Disc saving and loading of code blocks must be done by storing variables such as file start and length in Spectrum memory, switching to Sam, retrieving the variables and saving the code block from Sam BASIC.

Example of conversion of Spectrum program for file saving to disc.
The Spectrum variable 23296, which controls the method of returning to Sam BASIC, will hold 0 if the return is to the main menu. If it holds any other number, the return will be to Sam line 1000. In Sam BASIC, Spectrum addresses lie 65536 above their working Spectrum address, and so the contents of this variable can be retrieved from Sam BASIC by PEEK(65536+23296).

A typical Spectrum microdrive SAVE routine is

```
5000 GOSUB 6000:SAVE * "M";D;F$ CODE start,length:RETURN
6000 LET D=PEEK 32768:LET start=PEEK 32769+256*PEEK 32770:LET
length=PEEK 32771+256*PEEK 32772:LET F$="":FOR A=0 TO 9:LET
F$=F$+CHR$ PEEK(32773+A):NEXT A:RETURN
```

To convert this to saving from Sam, the Spectrum BASIC must be

```
5000 POKE 23296,1:NEW:RETURN
delete line 6000
```

23296 holding 1 will force the jump to Sam line 1000 when NEW switches to Sam. The Sam command GO TO 1 will return to Spectrum mode to execute the instruction immediately following NEW. 23296 could be made to hold 1 for SAVE, 2 for LOAD, 3 for DIR, 4 for ERASE and so on. The necessary Sam BASIC will be

```
1000 LET N=PEEK(65536+23296)
1010 IF N=1 THEN SAVER:ELSE IF N=2 THEN LOADER:ELSE IF N=3 THEN
DIRE:ELSE IF N=4 THEN ERASER:END IF
5000 LABEL SAVER:GOSUB 6000:SAVE "D"+CHR$(D+48)+":"+F$ CODE
start+65536,length:GO TO 1
6000 LET D=PEEK(32768+65536):LET start=DPEEK(32769+65536):LET
lenght=DPEEK(32771+65536):LET F$=MEM$(32773+65536 TO
32773+9+65536):RETURN
```

Line 1000 will fetch the contents of the Spectrum variable 23296, and line 1010 will call the appropriate Sam subroutine to perform the correct disc operation. 23296 holding 1 would call the save routine at line 5000. Line 6000 mimics the Spectrum line 6000, but peeks addresses 65536 above the Spectrum ones and uses Sam's more economical syntax. After calling line 6000, line 5000 saves the required code block to disc and GO TO 1 returns to Spectrum mode to execute the RETURN which follows NEW in Spectrum line 5000.

Similar subroutines could be written to perform the other disc operations. Note that Sam labels cannot be keywords such as SAVE or DIR - another letter must be added. See also Appendix 3.

SC_Speclone menu option 2
RANDOMIZE USR 0 SPECTRUM

This option returns to Spectrum mode and clears the Spectrum memory. It should be used the first time a jump is made to Spectrum mode, unless a Spectrum program has already been loaded.

Menu option 3
LOAD PLUS D SNAPSHOT FILE

This option should only be used to load Plus D snapshots which have previously been converted using option 4.

If, when a converted snapshot is loaded, there is no response to the keyboard on returning to Spectrum mode, use the NMI button to return to

the Sam mode menu and follow this procedure.

Press ESC - goes to Sam BASIC.
Enter POKE 80290,195
Enter GO TO 10 - returns to the **SC_Speclone** menu
Use option 3 and re-load the snapshot.

Most snapshots are compatible with the program, and this POKE will enable the keyboard response for the majority. If you have a snapshot which requires this POKE, in future exit to Sam BASIC and do the POKE before loading the snapshot.

Menu option 4
CONVERT PLUS D SNAP FILES

This option must be used before a snapshot can be run under **SC_Speclone**. If the POKE described above has been used to enable the keyscan of another snapshot, it must be restored before using this option.

Press ESC to go to BASIC.
Enter POKE 80290,226
Enter GO TO 10 to return to menu.

Put the disc containing the Plus D snapshot into drive 1 and select option 4. The catalogue will be displayed, and you will be prompted for the file number of the program to be converted. After a brief pause while the conversion is made, you will be prompted for the filename under which it is to be saved. Put the disc on which you wish to save it in drive 1 and give the filename. After saving, the program returns to the main menu. Option 3 may be used to load the converted snapshot.

Menu option 5
SAVE SPECTRUM MEMORY

The complete Spectrum memory, from Spectrum addresses 0-65535 is saved to disc.

Menu option 6
LOAD SPECTRUM MEMORY

Loads files saved under option 5. After loading, select menu option 1 to return to Spectrum BASIC with the memory preserved.

SC_Speclone
Memory map

Page	Sam addresses	Used for
0	16384-32767	Sam memory
1	32768-49151	Sam memory
2	49152-65535	Sam memory
3	65536-81919	Spectrum 48K ROM 0-16384
4	81920-98303	Spectrum memory 16384-32767 includes Spectrum screen
5	98304-114687	Spectrum memory 32768-49151
6	114688-131071	Spectrum memory 49152-65535

How SC_Speclone works

The Spectrum 48K ROM is modified to scan for the extra Sam keys such as DELETE and the function keys. This code is placed in a free area of Spectum memory between 14446 and 15615. Bytes 11446-14893 are used for the keyscan and other essential code. All Sam keys are scanned. See pages 25-26 for the special uses assigned to some of the keys.

A printer driver routine is proved at Spectrum addresses 14793 to 14826. (34 bytes). This enables the LPRINT command. LLIST mimics LPRINT because tokens are not expanded by this routine. The printer driver sends a linefeed after every carriage return. Instructions for disabling the linefeed are on p.26.

An OUT instruction is used to page the Spectrum ROM to Sam address 0 and to use screen MODE 1, the Spectrum compatible mode, at Spectrum address 16384 when switching to Spectrum mode.

The Spectrum NEW command is used as a switch to return to Sam mode, paging out the Spectrum ROM and paging in the Sam ROM and setting screen 1, MODE 4, at the normal Sam screen pages, the last two pages in memory. RANDOMIZE USR 14888 mimics the normal Spectrum NEW while in Spectrum mode.

In Sam mode all Spectrum addresses reside 65536 above their normal Spectrum address, and so a Spectrum address **n** may be POKEd from Sam BASIC at address **n+65536**.

In Sam BASIC GO TO 10 returns to the main menu.
GO TO 1 returns to Spectrum mode without resetting Spectrum memory.

SC_Speclone example
PCG's DTP PACK conversion

If you have a disc-based or microdrive version of Spectrum DTP PACK, you must first make a tape copy of the "WM" code block. Reset the Spectrum. Enter CLEAR 24733: LOAD *"m";1;"WM" CODE 54174. When the code block has loaded, enter SAVE "WM" CODE 54174,11362 and save the code block to tape. Prepare a newly formatted disc with only the SAMDOS file on it.

Now, using Sam, load the **SC_Speclone** utility and select menu option 2 - RANDOMIZE USR 0 SPECTRUM. In Spectrum mode, enter CLEAR 24733:LOAD "WM" CODE and play the tape to load the code block.

Type in the following lines of Spectrum BASIC.

```
10 LET D=NOT PI:LET S=D:LET L=D:LET X=D:LET A$="          ":RANDOMIZE
USR 63315
20 POKE 23296,1:GOSUB 60:NEW:RANDOMIZE USR X
30 POKE 23296,2:GOSUB 60:NEW:RANDOMIZE USR X
40 POKE 23296,3:GOSUB 60:NEW:RANDOMIZE USR X
50 POKE 23296,4:NEW:RANDOMIZE USR X
60 LET V=INT (S/256):POKE 23297,S-(256*V):POKE 23298,V
70 LET V=INT (L/256):POKE 23299,L-(256*V):POKE 23300,V
80 FOR A=1 TO 10:POKE 23300+A,CODE A$(A):NEXT A
90 RETURN
100 POKE 23296,5:NEW:RUN
200 POKE 23296,0:NEW:RUN
300 POKE 65532,158:POKE 65533,96:RUN
```

In line 10, there are 10 spaces in A$. Lines 20 to 50 POKE a code into 23296, to tell Sam BASIC which DOS operation to perform, and they replace the LOAD, SAVE, ERASE and CAT lines of the original Wordmaster BASIC. The subroutine at 60 pokes the file start and length and filename into variables from which Sam BASIC can retrieve them. Line 100 is a line which will return to Sam BASIC, and line 200 to the **SC_Speclone** menu. Line 300 will clear all files from Wordmaster's memory, and return you to the program, providing a quick way of deleting multiple files. The DOS commands are called normally, from the program's options. To use lines 100-300 you must exit from the program to Spectrum BASIC.

Now enter GO TO 200, put the prepared disc in drive 1, and select option 5 - SAVE SPECTRUM MEMORY. Give the file name "WM" when prompted. When the Spectrum memory has been saved, press ESC to return you to Sam BASIC.

Type in the following lines of Sam BASIC.

```
1000 LET A=PEEK (23296+65536):ON A:GO TO LOADER:GO TO SAVER:GO TO
ERASER:GO TO CATTER:STOP
1200 DEF PROC GETVARS
1210 LET S=256*PEEK (65536+23298)+PEEK (65536+23297)
1220 LET L=256*PEEK (65536+23300)+PEEK (65536+23299)
1230 DIM A$(10)
1240 FOR A=1 TO 10:LET A$(A)=CHR$ PEEK (65536+23300+A):NEXT A
1250 END PROC
1500 LABEL LOADER
1510 GETVARS:LOAD A$ CODE S+65536,L:GO TO 1
1600 LABEL SAVER
1610 GETVARS:SAVE A$ CODE S+65536,L:GO TO 1
1700 LABEL ERASER
1710 GETVARS:ERASE A$:GO TO 1
1800 LABEL CATTER
1810 CLS:DIR1:PAUSE 0:GO TO 1
8000 OPEN#5,"b":PRINT #5;CHR$ 27;"C";CHR$ 70;:CLOSE #5:RETURN
```

Lines 1000 to 1810 perform the DOS operations. Line 1000 PEEKs the variable to discover which operation is required and directs the program to the correct subroutine. Each operation ends in GO TO 1, which returns to the Spectrum program at the command after NEW, which switched to Sam mode. The procedure at 1200 sets up the variables. Line 8000 contains any codes you may wish to send to the printer. The ones given set up A4 paper length, but they may be changed to any you wish to use. If you use the line to send printer codes, the printer must be on line when you load the program.

Now alter line 9000 to read

```
9000 CLS #:PALETTE#:CLS #:CLEAR 29999:LOAD "rom" CODE:LOAD "high"
CODE:LOAD "low" CODE:LOAD "WM" CODE:DPOKE (23730+65536),24733:GO
SUB 8000:POKE 88832,0:RUN 1.
```

You have added commands to load the Spectrum memory, POKE the Spectrum RAMTOP and call the printer codes subroutine, and changed the RUN address to 1. You can now save the Sam BASIC to your prepared disc.

```
SAVE "AUTOWORD" LINE 9000.
```

Now enter POKE 80324,195 and SAVE "rom" CODE 65536,16384. Finally, you must copy the "high", and "low" code blocks from your **SC_Speclone** disc to your new disc. The program will autoload, and will be exactly like the Spectrum version except that the tape load/save operations are unuseable. PlusD disc files may be used, but if you have the tape version of DTP PACK, you must copy all the extension programs, fonts, etc. to Sam discs.

Version 1.00

Humphrey

SAM COUPE DISK UTILITY

By M.Holt

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Exclusive to:

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"Humphrey", is a general purpose disk utility, for the SAM Coupe.

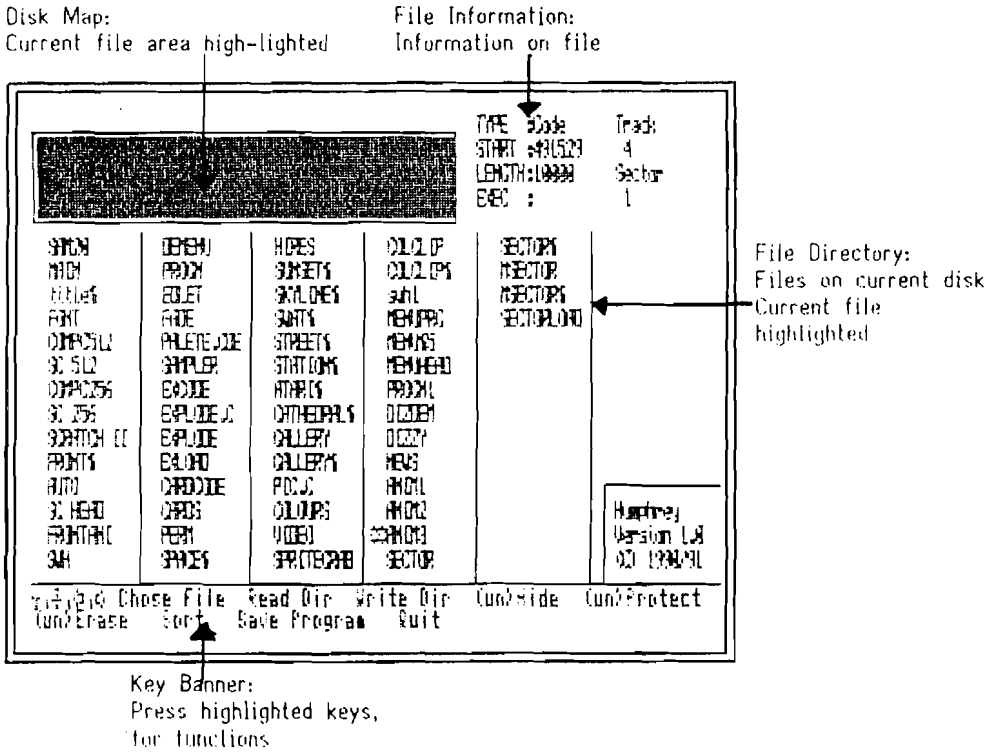
Its features include: showing which parts of the disk are used by a chosen file, "unerasing" erased files, "unhiding" and "unprotecting" of hidden and protected files, sorting the directory into alphabetical order and erasing a file, with a single keypress.

To load, just type in **LOAD "H".**

The basic principal behind "Humphrey", is for you to load in the directory, to do all your "fiddling about" with it, and then to replace the old directory with the new, revised version. By doing this, no alterations are made to the disk, until you are sure of them.

When "Humphrey" has loaded, the screen will display a countdown from 39 to 0, as it reads in the directory sectors. This will take approximately 9 seconds.

The screen will then display a disk map (see diagram), which shows disk usage. The centre of the disk is shown on the left (Track 4), the edge of the disk is on the right (Track 160). Sector 1 is at the top, sector 10 is at the bottom. So the map is slightly out of scale. The blue area, shows the unused space. The white area is used space and the flashing red area, is the space used by the current file (shown high-lighted in the file directory).



Below this disk map, is a list of the files on the disk. If a file name is preceeded by a "**H**", then it is currently hidden, "**P**" indicates a protected file and "******" indicates that it has been erased. (The commands **HIDE** "FILE" and **PROTECT** "FILE" are not documented in early versions of the SAM Disk manual.)

By using the cursor keys, you can move the red file bar, over the file names. As you move this bar over each file, the areas used on the disk by the file, are shown flashing in red on the disk map.
In addition to this, the file information area, on the top right of the screen, will update its information to whichever file you are pointing to. This information is as follows:

TYPE	:current file type
START	:starting address of file
LENGTH	:length of file
EXEC	:starting address (if CODE) or auto-start line number
TRACK/SECTOR	:starting track and sector for file

Function Keys
These keys, as marked on the key banner (at the base of the screen), activate certain options:

Pressing "H" will unhide a hidden file, or visa-versa.
Pressing "P" will unprotect a protected file, or visa-versa.
Pressing "E" will either erase an existing file, or it will attempt to recover an erased file.

(If the file is unrecoverable by ERASE, then a recovery will not be attempted. However, there is a small chance of a file not being able to be recovered, yet seeming to be able to! If nothing has been saved on a disk since erasure, the file should always be recoverable.)

Pressing "S" will sort the files into alphabetical order, and moves erased files to the end. It gives the option of keeping SAMDos in the first position in the directory. If SAMDos is not on the disk or you want it sorted with everything else, then press "N" when prompted.
Pressing "R" will read the directory of a disk. It can be used if you change disk, or if you change your mind about changes to a disk.
Pressing "V" will backup "Humphrey" to the current disk.
Pressing "Q" will quit "Humphrey".

None of these procedures will change the disk UNTIL you press "W" to rewrite the directory. It MUST be the same disk, or the disk will become unusable.

Please note: Neither the programmers, nor Steve's Software, accepts any responsibility for any misuse of this utility (in other words, if you make a "cock-up", it's YOUR fault!!).
This utility has been designed purely to investigate, and manipulate your own disks, and not as an aid for software piracy! Anyone found guilty of such an offence, will be reported to the neccessary authorities!

For any help or assistance, please contact us via:

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marking your envelope "Humphrey Enquiry"