

# The User's Guide

**SAN**  *drive*

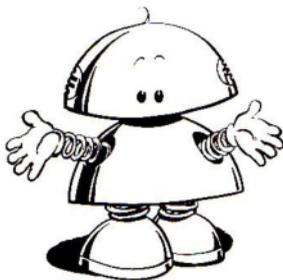
This pdf by Steve Parry-Thomas  
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For Sam Users everywhere  
[www.samcoupe.org](http://www.samcoupe.org)

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SAM DISK DRIVE

THE USER'S GUIDE

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DISK DRIVES -  
THE BASICS

Not so long ago, home computers didn't use disk drives. The basic way to load in your software was from cassette tape. This is much slower than using a drive, but most homes already had a cassette recorder. Cassette loading made computers affordable.

"Life is too short to stuff a mushroom."  
(Shirley Conran)

But with computer memories - and therefore computer programs - growing ever larger, home users began to get irritated. Things eventually reached the point where you could brew more than one cup of tea while waiting for software to load. That's why - for you committed users - MGT has made it possible to add either one or two disk drives to your SAM Coupe.

Whether your software is on tape or disk, the raw materials are the same. Information stored in your computer's memory is transferred to magnetic-coated tape or disk, and can be placed back into the computer memory (the RAM) whenever you're ready.

To find the file you want on tape you have to start at the beginning and carry on until the end, or until you reach what you're looking for. But with a disk, you can move the head (just like the stylus on a record player) directly to the place you want. There's no need for "fast forward" with a disk.

You'll find the difference in speed dramatic. SAM Coupe disk drives can store up to 780K of data on a single disk, and you'll be able to load even very large programs in a few seconds. Say goodbye to the kettle!

3.5" DISKS

Take a disk. No, not just any disk, but a 3.5" 135 tracks per inch (tpi) disk, because these are the ones that you'll need for your SAM Drives.

So why are they called disks when they're square? Well, what you're looking at is the plastic casing which protects the delicate disk inside. You can see the disk if you slide across the metal shutter at the top. But don't do this if you're prone to accidents: the actual disk is very sensitive to finger-prints, dust, heat, liquids and magnetic (or electrical) fields.

"Any sufficiently advanced technology is indistinguishable from magic."

(Arthur C Clarke)

## TRACKS AND SECTORS

Now, a little theory. When you're using SAM drives, the disk is divided into 80 concentric tracks. (Unlike an LP, there's not one continuous groove: each track is separate from the next.) And in turn, each track is sub-divided into 10 sectors - segments of a track. That's 800 sectors in all, with another 800 on the other side of the disk - 1600 sectors altogether. The SAM Coupe uses 40 of the sectors to store essential indexing, or DIRectory, information, leaving 1560 sectors for your programs. Each sector can store 0.5K of data, which means that on a single disk, your total capacity is 780K.

Not all computers work like the Coupe. They may have different numbers of tracks or sectors. This means that generally a disk created by one make of computer cannot be read by another make. And when you buy your disks, the manufacturers have left them empty of track and sector information, so that they can be used with any type of computer. Before you use them, you'll need to FORMAT them - to tell them the correct track and sector format for your computer. But we'll come to this later.

## INSTALLING YOUR DISK DRIVES(S)

First disconnect the power supply from the Coupe.



Now set the computer in front of you. The front of the machine is divided into three sections. The middle section is a permanent fixture. But the panels to the left and right of the middle section are removable. When you take them off, they leave slots into which the SAM Drives fit.

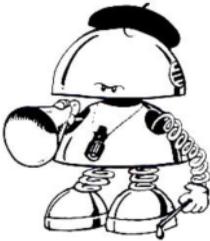
If you have only one drive to install, you'll need to remove the left-hand panel. Gently praise it off by exerting upward pressure on the bottom of the panel. No tools are required.

If you now look into the recess left by the panel's removal, you'll see a connector deep inside the computer, ready to receive the connector on the end of your SAM Drive. Now let's make sure you've got the drive the right way up. The blue slot for your disks should be uppermost, with the disk indicator light and the disk eject button below.

Insert the disk drive into the recess and press it home until the connection is fully made and the front of the drive is flush with the front of the computer. (You can make sure of this by looking through the slots in the base of the computer.) Now make the connection really secure: take the two screws from the SAM Drive packaging, and screw them into the holes you'll find on the underside of the Coupe towards the left-hand side. FAILURE TO USE THE SCREWS WILL DAMAGE YOUR DRIVE, but they MUST NOT BE TOO TIGHT.

That's one drive. If you're have two, do exactly the same, on the right-hand side of the computer. Now, you're all set up and ready to go. Almost...

THIS IS YOUR DISK  
DRIVE CALLING!



Turn the power back on. With your drive installed, you might expect that you'd be ready to start saving and loading with it. But you're not yet. The problem is that the computer needs to be told whether it's dealing with a cassette recorder or a disk drive.

Read and understand this section, but don't do anything yet. We'll give you further instructions in the next section.

DEVICE is the command which tells the computer which storage device it's communicating with.

Without instructions, the computer normally defaults to DEVICE T - it assumes that storage is to a cassette tape. To use disk drive number 1 (the left-hand drive), you could simply type:

```
DEVICE d           or
DEVICE d1         or
DEVICE D1
```

and press the <RETURN> key as usual.

This would mean that all subsequent SAVE, LOAD, MERGE and VERIFY commands would apply to disk drive 1. To revert to tape or move to disk drive 2 for a long session, you'd simply type in DEVICE T or DEVICE D2.

But to save you typing DEVICE D at the beginning of every disk drive session, we give you a short-cut: when you press the F9 function key, the Coupe automatically sets DEVICE D1.

In addition pressing F9 causes the system to 'boot'. Boot is computer jargon for: "copy the Disk Operating System into memory, and load and run an AUTO file if present."

#### WRITE-PROTECT

"I am just a computer card - do not spindle, fold, tear or mutilate"

(Berkeley University graffiti)

If you have a particularly important disk, you can prevent accidental erasure or formatting. Turn the disk bottom side up. In the bottom right-hand corner there's a black switch. Use a finger-nail to press the switch down, leaving a hole showing in the disk. This write-protects the disk: you can only load programs from it - not erase or format the disk. MAKE SURE THAT YOUR MASTER SYSTEM DISK IS WRITE PROTECTED BEFORE GOING ANY FURTHER.

#### THE SYSTEM DISK

The computer takes control of the disk drive from a number of different points. SAM BASIC contains the essential commands. But we also store some of the control instructions on a disk - the System Disk - and these are loaded into the computer's memory at the beginning of each session with a disk drive.

The advantage of this is that we - or others - may later want to add new disk drive facilities. By keeping some of the DOS (the Disk Operating System) "soft" on a disk, it means that we will easily be able to offer upgrades without recalling machines.

"Build a system that even a fool can use, and only a fool will want to use it.

(Arthur Bloch - "Murphy's Law")

Take your System Disk: make sure that it is write-protected (see previous section). On one side of it, you'll see an arrow. This shows you how to insert it into your drive. Press it fully into drive 1. You'll notice that the disk eject button pops out of the drive and the drive light goes on for a moment. When the drive light switches off press the eject button and you'll eject the disk. Now push the System Disk back into the drive.

Next, press the F9 function key. This sets your DEVICE as D1 and issues the command 'BOOT' which tells the computer to load the disk operating system (SAMDOS) into memory. On the System Disk there is an AUTO file, and when F9 is pressed this is LOADED and RUNS giving you a menu of options. After the list of menu options the number of disk drives and how much memory you have fitted is displayed. Your screen will look similar to this:

THE MENU  
SCREEN

Sam Coupe Disk System 2

- A - Backup Current Disk
- B - Format New Disk
- C - Demonstration Program
- D - Flash!
- E - Directory
- F - Spectrum Emulator
- G - BASIC Translator
- H - UDG Designer
- I - Font Loader
- J - Screen Dump Loader
- K - LOAD File by Number
- L - Exit to BASIC

Disk Drives 1 RAM 256K

Enter Menu Option

If you haven't yet seen the Demo program, type C to see a little of the Coupe's potential. The demo returns you to the menu when it has finished.

MAKING NEW  
SYSTEM DISKS

we said that your System Disk was important. That's why the first thing you should do is copy the System Disk.

Select option A from the Menu, and follow the on-screen instructions, making sure that you put a new disk in the drive where requested to do so. The new disk will be formatted (wiping out any information stored on it, so only use a brand new blank disk). After formatting the disk will be verified to make sure that it is in good condition.

You will then be asked to place the source disk (ie your System Disk, in drive 1). From now on you will be asked to alternately put in your target disk (the new disk) and your source disk (the System Disk), until the System Disk has been completely copied onto the new disk. The process involves lots of disk swaps because the disks store such a large amount of data, (a 100,000 word novel's worth with room to spare!).

Once the copy is complete a directory of your System Disk is displayed on-screen. Press the spacebar to get back to the menu.

You should remove your System Disk and put it away in a safe place, (see the Good Housekeeping section near the end of this manual for disk care information). From now on you should ONLY USE THE COPY of the System Disk.

EXPLANATION  
OF THE MENU

If you wish to create a disk which only has SAMDOS on it, ie a disk which you can start up the computer with but which has plenty of room for your own work select option e, using a blank disk.

- A Backup Current Disk  
This option will make an exact duplicate of the disk in the drive. Use this option to duplicate your master system disk.
- B Format New Disk  
Use this option to prepare blank disks for use. It offers the option of copying SAMDOS onto the disk. NB tracks on the disk are numbered 0 to 79 on side 1 and 128 + 0 to 79 (ie 128 to 207) on side 2.
- C Demo Program  
Chose this option to get a taste of the Coupes capabilities.
- D Flash!  
This is the professional quality art package included with every Coupe. Refer to the Flash! manual on how to get the most from it. There are SCREEN\$ files on the disk which you can load into Flash! and work with. Flash! saves screens to disk as CODE files. If you wish to view a screen saved from Flash! outside of Flash!, or load a Flash! screen into your own program, load the file as a SCREEN\$ file, eg: LOAD"Astro2" SCREEN\$
- E Directory  
This option displays a list of every file on the disk.
- F Spectrum Emulator  
This is the Spectrum Emulator program, designed to allow you to run many Spectrum 48K programs on your SAM Coupe.
- G BASIC Translator  
This program will translate most Spectrum BASIC programs into SAM BASIC.
- H UDG Designer  
This program allows you to create your own characters, see the detailed notes further on.
- I Font Loader  
This program loads in the international character set.
- J Screen Dump Loader  
This program loads in a machine code extension to SAM BASIC to allow DUMP and DUMP CHR\$ to work.
- K LOAD File by Number  
This will display a directory of files and ask for the number of the file you want LOADED. -
- L Exit to BASIC  
This clears the menu from memory and returns you to the start-up screen.

## THE DIRECTORY

Put your new System Disk back into drive 1. As well as SAMDOS, there are several other programs on the disk. If the menu is on the screen select K. To see a list of the files on the disk type: DIR 1 followed by <RETURN>.

From now on whenever you have a command to type in we will print the command and assume that you will type <RETURN> afterwards.

DIR displays on screen the DIRectory of the disk drive which is your current DEVICE. If you want a DIRectory of drive 2, type: DIR 2 You'll see a screen similar to this:



\* SAM DRIVE 1 - DIRECTORY \*

```
1 samdos2      20 C 229385,10000
2 auto         7 BASIC      10
3 demo        30 BASIC      10
4 screen1     49 SCREEN$
5 screen2     49 SCREEN$
6 screen3     49 SCREEN$
7 screen4     49 SCREEN$
8 astro       49 SCREEN$
9 king        49 SCREEN$
10 flash       4 BASIC      9800
11 flash1     13 C 32768,57344
12 flash2     83 C 105312,42000
13 fontld      2 BASIC      10
14 font        1 C 21648,328
15 dumpld     2 C 20224,512
16 UDG Design 19 BASIC      10
```

Number of Free K-bytes = 472

## EXPLAINING THE DIRECTORY

Your screen won't look exactly like this, but we've included most of the features you'll come across later, so that we can explain them here.

Each named item on the disk is a file. Some files are BASIC programs, others machine code programs, and others are screen pictures. on each disk you can have as many as 80 files, provided there's still space left on the disk.

Most of the information on the DIRectory screen is put there by the Coupe. The only information you'll have to supply when you create a file, is the file-name, which is shown in the second column.

File-names can be up to 10 characters long, in upper or lower case, or a mixture of the two. File-names can include spaces too.

The first column on the left shows the file number. Whenever you SAVE a file, the Coupe will give it the first available file number. So if you have the DIRectory shown in the example, the next file you SAVE will automatically become program number 17. This program number will stay the same until the file is ERASEd (we do not list files in alphabetical order). But if you ERASE, say, program 9, then the next file you SAVE to disk will become the new file number 9.

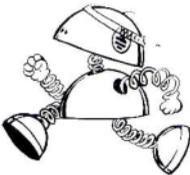
The third column shows the number of disk sectors used. Each sector holds 512 bytes (= 0.5 Kilobyte) so to find out the number of Kilobytes used for each file, divide the number in the third column by 2.

The fourth column is for the file type, which the Coupe automatically selects. These are the different types of file available:

BASIC	= BASIC program
C	= Code file
SNP 48K	= Snapshot file
SCREEN\$	= Screen file
D ARRAY	= Numeric data array
\$ ARRAY	= Character array

You may not fully understand the significance of all these types of file yet, but don't worry. The essentials of disk operation are explained in this manual. Close reading of the computer manual will explain most of the rest - and if you're still stumped, the monthly magazine FORMAT regularly includes articles for people who want to learn more about the manipulation of files.

The right-hand column of the DIRectory shows either the start address and length of a CODE file - advanced programmers will find this handy - or the line at which a BASIC or Code program autoruns on LOAding.



If you can't take all this in now, don't worry! We'll show you how to use what you need. Something much easier to understand is the free space left on the disk. Remember you start with 780K free: every time you SAVE a new file on the disk, the computer automatically re-calculates how much space is left.

If your DIRectory is longer than the screen, you will be prompted to scroll; when you have read the directory, press <RETURN> to see the next screen of directory entries.

SAVING A FILE  
AND VERIFYING

Take a copy of your system disk, and put it in your disk drive.

Now enter this short program called "Squares", which we'll use to illustrate the various drive operations.

```
10 REM Squares
20 FOR n=1 TO 10
30 PRINT n,n*n
40 NEXT n
```

"The first rule of intelligent tinkering is to save all the parts"

(Paul Ehrlich)

Then, to SAVE the program on the disk in drive 1, type: SAVE "Squares".

Squares is now your file-name. Don't forget that file-names can be any combination of letters and numbers - or even spaces - but the maximum number of characters is 10. You can use upper or lower case characters, or both - so "THIS file" would be the same file as "THIs File", although "THISfile" would be a new file. (Don't use the characters ? or in your file-names, as they have special uses; we'll come to this later.)

LOADING A  
FILE

Now check that the file has been correctly SAVED by typing: VERIFY "Squares".

An OK message at the bottom of the screen will confirm the SAVE. Now, clear Squares from the computer's memory by typing NEW.

Now you can reLOAD Squares from the disk with: LOAD "Squares"

When the OK message appears, the program has been loaded. But so far we haven't given an instruction to make the program automatically run when it is LOAded. Let's do that now with: SAVE "Squares" LINE 10

But of course there's already a program called Squares SAVED on the disk. The Coupe tells you this and asks whether you wish to overwrite the existing file by typing Y (Yes) or N (No). Type Y <RETURN>. Then: LOAD "Squares"

When LOADING files the Coupe will look for the file on the last device used. Thus, if you have entered the command DIR 2 before issuing the LOAD command, the Coupe will look on drive 2. Similarly, if you have performed a command using drive 1, the Coupe will look on drive 1.

ESCAPING FROM A PROGRAM

To break into the program and stop Squares running, use the Coupe's normal ESC key.

Note that ESC will stop the computer running most normal routines and BASIC programs, but it will have no effect during a disk read/write (i.e. LOAD or SAVE) operation until the disk activity has been completed.

Type DIR 1 to see 'Squares' directory entry.

RENAMING A FILE

To RENAME a file, we use the keywords RENAME and TO. Let's RENAME the Squares file as Example 1: RENAME "Squares" TO "Example 1"

Look at the DIRectory again, to confirm that the change has been made.

COPYING A FILE

To copy a file, use the two keywords COPY and TO. COPY the program you have written by typing: COPY "Example 1" TO "Newcopy"

"One point has already been proved.

Everything that happened once can happen again"

(Jacobo Timerman)

Once the file has been loaded into the computer's memory, you are prompted to "Enter target disk press any key". To make a new copy of the file on the same disk, simply press the SPACE bar now. Or, if you want your copy on a different disk, insert that now and press SPACE. (Don't forget that your disk must be formatted.)

When copying's complete, you'll see: "Enter source disk press any key". The Coupe is checking whether there are more files to be copied. (You'll see why when you come to "Wild cards" later.) so re-insert your original disk and press SPACE. If there are no other files to copy, you'll see an OR message.

MAKING BACK-UPS

"It can't happen here is number one on the list of famous last words"

(David Crosby)

Computer abuse is a growing social problem. A common cause of violence is when the computer deliberately corrupts or loses a vital file. Don't believe that it can't happen to you. It will! Even the SAM Coupe can be temperamental. So make it a habit to back up key files. Use a different disk but keep the same file-name. In this case, using your original disk, type:

COPY "d1:Example 1" TO "d1:Example 1"

Again, you're prompted to insert the target disk, and this time you'll put in a different (formatted) disk. If the file already exists on the back-up disk, you'll be asked whether you wish to overwrite it. Type Y for Yes or N to cancel the copy.

If you're using two drives, you can also copy a file from one drive to the other:

```
COPY "d1:File-name" TO "d2:File-name"
```

If you add a file-name after the d2, the new copy will have this as its file-name; otherwise it will be the same name as the original file.

The COPY TO command will not copy Snapshot files, which we will come to later.

You can also use COPY TO to copy from drive 2 to drive 1. For example:

```
COPY "d2:file-name" TO "d1:new name"
```

#### ERASING A FILE

Let's now erase the file called Example 1:

```
ERASE "Example 1"
```

Your DIRectory will confirm that the change has been made.

(As usual, you can also ERASE"D2:file-name".)

#### SHORT-CUTS TO LOADING

Now you've done it the hard way, let's start making things easier for you. First, loading. Instead of typing in the LOAD command with the file-name, you can type, for example: LOAD B. Remember that the Coupe will attempt to LOAD from the default device.

"Machines have less problems. I'd like to be a machine."

(Andy Warhol)

If your DIRectory was the same as that shown earlier in this manual you would load the Astronaut screen - file number 8 in the DIRectory. This abbreviated syntax is particularly handy if you're the sort of person who uses code files. For example,

```
LOAD 15 instead of  
LOAD "dumpld"CODE
```

#### WILD CARDS



Wild cards in a file-name allow you to COPY, ERASE or inspect the DIRectory of a group of similar files in a single operation. Let's imagine, for example, that you have a series of files called, say, numbers1, numbers2, numbers3, numbers4.

To ERASE all of them, you can type:

```
ERASE "numbers*"
```

You could also type

```
ERASE "n*"
```

but this would ERASE eve file on the disk starting with the letter n!

The effect of the asterisk is to say that all the other letters in the file-name don't matter: you wish to ERASE all files beginning with "n". Be careful: we mean ALL files.

You could also type: ERASE "??mb\*"

You would then ERASE all files which have "mb" as their third and fourth letters. The effect of each question-mark is to say "this letter is of no significance".

The same syntax - using \* and ? - is available for COPY and DIR commands. Thus if you wanted to COPY all the "numbers" files as "figures" files, you'd type: COPY "numbers\*" TO "figures\*"

Note that if you are using wild cards, the new file-name must have the same number of characters as the first -in this case eight.

#### FILE-NAME EXTENSIONS

You already know that file names can be up to 10 characters long, including spaces. But to help you organise your files, the Coupe allows you to use file-name extensions, in much the same way as a business computer.

For example, you might tag all your letter files with the extension "let", all your database files with "dat", and all your graphics files with "gra":

Your DIRectory might be:

Letter1.let	bank.dat	stamps.dat
bank.let	bank.gra	stamps.gra
invite.let	letter2.let	bank2.dat

(Note file-names are still less than 10 letters.)

Then to display a DIRectory of all your letters, you'd type: DIR 1 "\*.let", or to display a listing of all the files concerning your bank affairs, you'd type: DIR 1"bank.\*"

#### MORE ABOUT FORMATTING

You've already learnt how to FORMAT a disk using the menu program on the System Disk. When you did this SAMDOS2 was also copied and you made new system disks.

However, it's also possible to FORMAT using a direct command. Doing it this way, you don't of course copy the DOS as well. Simply type:

FORMAT  
or FORMAT "d2:" for drive 2.

You'll be asked to confirm that this really is a disk you want to format. All data on a disk which is FORMATTed is ERASEd, so you must make sure that you do not FORMAT a disk with important information on it.

It's always useful to have FORMATTed disks standing by. But you won't be able to use these disks to load SAMDOS2 because the SAMDOS2 file isn't there yet. To add the SAMDOS2 file, type:

```
SAVE "SAMDOS2" CODE 229385,10000 (for a 256K machine)
```

```
SAVE "SAMDOS2" CODE 491529,10000 (for a 512K machine)
```

SECTOR BY SECTOR  
COPYING - TWO  
DRIVES

The following command will copy a disk in drive 2 to a disk in drive 1. Before using this command make sure that the disk in drive 2 is write-protected. The command is:  
FORMAT TO "D2:"

This will FORMAT the disk in drive 1 and then copy the contents of the disk in drive 2 to the disk in drive 1, sector by sector - in other words, very accurately but very slowly! This command can only be used on a two-drive system.

SHORT DIRECTORIES



Suppose you have dozens of files on your disk and you want to see them all at the same time. There's a way of displaying a DIRectory of file-names only. In MODE3 you will get three names on each line, and in MODE5 you will get five names on each line, so that just about everything can be seen on a single screen. Take a disk with several files on it and type: DIR

You'll see a DIRectory in this form:

```
* SAM DRIVE 1 - DIRECTORY *  
  
samdos2    auto      demo  
screen1    screen2  screen3  
screen4    astro     king  
flash      flash!    flash2
```

If you change to MODE3 by typing: MODE3 : DIR you will get a similar directory but with five names across. (In either case you will have more files than printed here if you use your system disk).

You can also use the commands - DIR 1! and DIR 2! - to print out short directories.

PRINTING THE  
DIRECTORY

To print out the DIReCTory on your printer, you can use the special DIR #3 command. For example, to send the DIReCTory on drive 1 to the printer, type: DIR #3;1

To print a short DIReCTory from drive 2, type: DIR #3;2!

PROTECTION -  
"Memory is more  
indelible than  
ink"

You can protect an individual file from being ERASed by typing the command:

PROTECT "file-name"

(Anita Loos)

Protection can be removed by:

PROTECT OFF "file-name"

- IS NOT  
INFALLIBLE

When a file is protected, it's still possible to SAVE or ERASE over it.

SAVE OVER "file-name"

ERASE OVER "file-name"

Also you can COPY the contents of a file (say 'new-file') OVER the contents of another file (say 'old-file').

COPY OVER "new-file" TO "old-file"

The above will copy the contents 'new-file' to 'old-file'; 'old-file' will keep its original name. This will work even if 'old-file' is PROTECTed.

HIDDEN FILES

You can hide files too. Simply type:

HIDE "file-name"

"Stay out of sight  
and you'll stay out  
of trouble"

and it will no longer appear in your DIReCTory. HIDE OFF "file-name" does just what you'd expect. But watch out! Hidden files can still be ERASed OVER or SAVED OVER. When you HIDE a file, it becomes both HIDDEn and PROTECTed.

(John F Kennedy)

READING AND  
WRITING TO A  
SECTOR

This is for more advanced users, allowing you to read from or write to a specified sector on the disk. The command is:

READ AT D,T,S,Address

WRITE AT D,T,S,Address

D = the drive number (type 1 or 2, not D)

T = the track number (from 0 to 79 on side 1;  
from 128 to 207 on side 2)

S = the sector number (from 1 to 10)

Address = the start of a 512 byte area in the memory, where the contents of the sector are stored. (Must be less than 65536).

For further information on the directory structure see the Technical Manual (3.0 or later).

INSTRUCTIONS  
FOR DISCIPLINE  
AND PLUS D  
OWNERS

You may be a user of one of MGT's earlier disk interfaces for the Spectrum - the DISCIPLINE or the PLUS D. It's not possible (or necessary) to attach these devices to the Coupe. (However, we have made provision for you to use your current disk drives using a special SAM drive interface - call MGT's Customer Care for more details).

Disks previously created on the DISCIPLINE and PLUS D can be read by the Coupe (although BASIC files cannot be read - snapshot files are fine). First 'boot' SAMDOS2 in the normal way. Then insert your DISCIPLINE or PLUS D disk and carry on, using the commands described in this manual, not the ones you used to use with the Spectrum.

You will NOT be able to make changes to these disks on the Coupe. You should not attempt to SAVE or RENAME or ERASE files on these disks - if you do you are likely to corrupt the disks. If you wish to make changes, SAVE the program in memory to a disk created on the Coupe.

SNAPSHOT FILES



DISCIPLINE and PLUS D users will be familiar with snapshot files. The MGT Spectrum interfaces have a button which stops the program and allows you to save the current program to disk. This operation is called snapshotting. The Coupe has a similar facility, which you'll be able to use with most Spectrum 48K - though not SAM or Spectrum 128K - software. Do it like this:

Boot your computer; ensure that a copy of the System Disk is in drive 1, now press F9. When the menu appears choose option F (Spectrum Emulator). You will be offered two options. Use E (emulator) if you wish to load a game from tape.

When the software is running, press the Coupe's BREAK button to halt the program. Don't hold it on: just press it lightly - on and off. Now you have several options:

Press key 2 on the Coupe: the program re-starts.

Press key 3: the screen image is SAVED to the disk in drive 1. (Holding the Shift key while pressing key 3 will SAVE to disk drive 2, if installed.)

Press key 4: a 48K program is SAVED to drive 1. When you LOAD it again later, it will restart from the same point at which you made the snapshot SAVE. (Shift and key 4 SAVES to disk drive 2.) So you can start from wherever you want in a game.

Press key x: you're returned to SAM Basic. This give you the opportunity to change the screen colours using the PALETTE command. Or you'll be able to make changes to the program by using PEEK and POKE.

(Note that the popular magazines often publish what they call "Multiface POKES", allowing you to have extra power or infinite lives, for example, in games. If you've loaded a Spectrum game onto the Coupe, the same POKES will often apply, although you'll need to add 65536 to the address line. For example, a magazine POKE 27236,10 would be entered on the Coupe as POKE 92772,10.)

After making any changes you want to using SAM Basic, return to the program by typing:  
CALL MODE 1

Later, when you look at the DIRectory, you'll see that the snapshot files might be listed like this:

```
3 SNAP C 14 SCREEN$  
4 SNAP D 97 SNP 48K
```



The Coupe has given the first program (the screen SAVE) the identifier "C" because it is the third file in the directory. The first would be "A", the second "B", and so on. It would be wise to RENAME your snapshot files so that you can keep track of which games you have.

To LOAD Snap C back in, you'd simply use the normal command: LOAD 3

Please note again that the snapshot facility will only work with Spectrum 48K programs. Software houses are likely to make different use of the BREAK button to allow you to transfer SAM programs from tape to disk. Read the instructions that come with the software to find out what to do.

#### GOOD HOUSEKEEPING

Your disks are valuable, not only because of the information they hold, but also because of the time you have spent creating them. So force yourself into these good habits:

"Inanimate objects are classed scientifically into three major categories - those that don't work, those that break down, and those that get lost"

(Russell Baker)

1. Keep your disks in a disk case to protect them from the elements and make sure you don't lose them. Keep the case and your disks away from sunlight and other sources of heat, from cold, from magnetic (or electrical) fields, such as TV's, Hi-Fi speakers, etc., and from young children or anything else that's sticky.

2. Label your disks so that you can remember what's on them. If you begin to amass large numbers of disks, it would be a good idea to get a disk organiser utility program.

3. Make back-ups of all your key files - always. And write-protect any disks containing files that you couldn't live without.

4. Before you turn the power to your computer on or off, remove disks from your drives in case a sudden surge of electricity corrupts the data.

5. Do not insert or remove a disk from a drive when the drive light is on. Do not press the reset button with a disk in a drive.

#### ERROR MESSAGES



If you make a mistake, such as trying to save a file to a disk that is write-protected, or mistyping a command, SAMDOS will produce an error message. The basic Coupe error codes are described in the User's Guide, but there are a few additional messages that you might see when using a disk drive:

NOT UNDERSTOOD IN SAMDOS. The DOS is booted, but the Coupe is confused by your (mis)use of BASIC. Try the command again, and check the spelling and syntax (the form of the command).

FILE NOT FOUND. You're trying to LOAD, COPY, VERIFY, ERASE or RENAME a file that doesn't exist. Check that you've typed in the file-name correctly, that you have the right disk in the drive, and that the DEVICE is set to the drive which you wish to use.

NOT ENOUGH SPACE ON DISK. The file you are trying to SAVE is too large for the space remaining on the disk. Insert another (formatted) disk and try again.

DIRECTORY FULL. The Coupe's disk directory can hold a maximum of so files. Either ERASE some files to create space, or use another (formatted) disk.

DISK WRITE PROTECTED. If you want to SAVE, ERASE or otherwise modify files on this disk, you'll have to unlock the write-protect switch on the disk.

SECTOR ERROR. The information you've SAVED has somehow been corrupted - you'll need to rewrite the file and SAVE again. If you're an experienced programmer, the numbers in the message tell you which track and sector is corrupt. If a sector error appears, make back-ups of all the undamaged files and then re-FORMAT the disk. If new sector errors often appear, something's wrong. It might be worth cleaning the drive heads.

FORMAT DATA LOST. Try loading SAMDOS from another disk. If that works, at least your drive is okay. If not, it's time for a repair. If you succeed with another disk, try loading files from the first disk again: it might be just one file that's corrupted. But if the message re-appears, you'll need to re-FORMAT the disk. Hope you've kept backups!

LOADING ERROR. There are several possible causes of this problem. In order of likelihood:

i) Incorrectly fitted disk drive.

The computer should be switched off and the power supply disconnected. The drive should be removed and then reinserted making sure that it is pushed fully home. The screws must NOT BE TOO TIGHT.

ii) Corrupt or damaged SAMDOS disk.

Ask us for a replacement disk.

iii) Actual hardware fault.

iv) Incorrect stepping rate.

If you are using the external disk drive interface it may be that you need to slow down the stepping rate) try 12 milliseconds in the first instance.

#### DRIVE VARIABLES

There are several drive variable (DVAR) commands which change the way in which you use your drives. These are also particularly useful if you are using a 40-track external drive (with the special MGT external drive interface), or if an external drive has a different step-rate (= head access time) from the standard SAM drives.

You can change a drive variable by typing:  
POKE DVAR n,d

where n is the drive variable number and d is data.

The drive variables are:

- 0 control of border flashing. (POKE DVAR 0,0 is no flash; 0,7 is the default setting.)
- 1 drive 1 data. (If the drive is double-sided, type POKE DVAR 1,208 for 80 tracks, 1,168 for 40 tracks. If single sided, POKE DVAR 1,(number of tracks.)
- 2 drive 2 data. (Set up as 1 above.)
- 3 drive 1 step rate. (POKE DVAR 3,0 = 3 milliseconds step rate; POKE DVAR 3,3 would be 6 milliseconds.)
- 4 drive 2 step-rate. (Set up as 3 above)
- 5 allows you to fill in lines in the DIRectory. (E.g. POKE DVAR 5,"-" would fill in DIRectory lines with a series of hyphens. Experiment!)
- 6 will be used in a future network file server system.
- 7 type PRINT PEEK DVAR 7 to see the current SAMDOS version number.

#### UGD Design

This program allows you to create user-defined graphics, and to save them as a file. Once saved you can import the graphics which you have defined into your own programs.

UDG Design can be loaded either from the menu (option 7), or by typing LOAD"UDG Design". The program will autorun. It is controlled by a joystick or by the cursor keys and spacebar.

To fill an empty pixel (picture cell) press fire (or the spacebar). If you fire (or press the spacebar) on a filled pixel it will become empty.

To chose a menu option press 'M' or 'N' to get to the menu, and use either the joystick or cursor keys and spacebar to choose an option. If you get the 'Filename?' prompt when you press N or M, press <RETURN>.

Save will ask you for a filename; type in the name of your choice, and the program will save the user-defined graphics created so far under this name.

Load will ask you for a filename; type this in and the program will load the file. The file must be a file of user-defined graphics, either created by you or the sample file supplied, (called 'test.udg'). You can also load the file called 'font' which contains the international character set. SELECT allows you to select which four characters to work on, again by using the joystick or the cursor keys and spacebar.

Return returns you to editing user-defined characters.

Clear Characters empties the four characters currently selected.

For example, suppose you load UDG Design and create various graphic characters. Once you have finished you save them as a file called, say, SUPER.UDG.

If you now write a BASIC program and wish to use the characters you have created, at the beginning of your program include the line:

```
LOAD "SUPER.UDG" CODE
```

To display your graphics in your program you must print graphics characters by the numbers assigned to them. User defined graphics are stored as character numbers 144 to 167. For example to print character number 144:

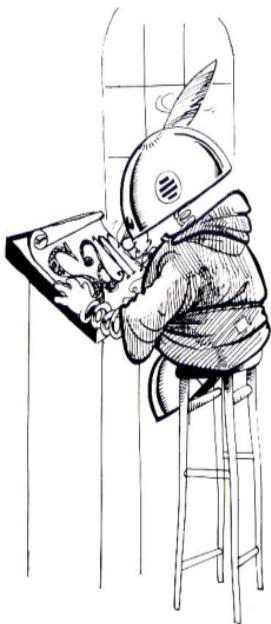
```
PRINT CHR$ 144
```

Or to print all your graphics characters:

```
10 FOR character=144 TO 167
20 PRINT CHR$ character,
30 NEXT character
```

To finish with UDG Design press ESCape (after SAVEing your work) and then press F9.

A simple demonstration program, 'udg demo' is included. Load it from the main menu by choosing option K and then the program number (25). The program returns to the menu when finished.



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