DivIDE Plus

Hard Disk Expansion Interface
For the Sinclair ZX Spectrum

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for RWAP Software

QUICK START GUIDE

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The manual has been written specifically for users of the DivIDE Plus hard disk interface for the Sinclair ZX Spectrum and contains various supplements for each type of firmware which can be used with that interface.

The manual is intended to provide the user with detailed information adequate for the efficient installation and operation of the equipment involved. However, while every effort has been taken to ensure accuracy, the manufacturer assumes no liability resulting from errors or omissions in this manual, or from the use of the information contained herein.

The manufacturer reserves the right both to change the specifications of the DivIDE Plus and the firmware and to revise this publication from time to time without obligation to notify any person of such revision or changes.

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What do I need

The DivIDE Plus comes ready to plug into your Spectrum, switch on and go. However, you will need a compatible Compact Flash card (hard disk, or CD-Drive) to be able to store files.

Most people use a Compact Flash card - if you want to use a hard disk or CD instead, read the User Manual for more details.

Compact Flash Cards

Not all Compact Flash cards are compatible - the best ones to use appear to be original SanDisk (beware the many fakes) of at least 1GB, with (c) 2003 or later on them. We also use Integral 1GB CF cards.

Format the Compact Flash card on the PC as FAT (or FAT-16) - this should be how it is supplied in any case (ensure it is not FAT32). You can then download games and other programs for the Sinclair ZX Spectrum from various websites - the best one to use is www.worldofspectrum.org/archive.html

Programs are stored as an image file on the internet - the easiest ones to use are .TAP files or .z80 files (you will also come across .tzx and other file formats).

What are all of the Spectrum file formats I come across?

Various different images have been made of programs for the ZX Spectrum and stored on the internet. Make sure that when copying files across to the ZX Spectrum you choose a file format which is supported by the DivIDE Plus.

The most common file formats are as follows:
.tap - This is an image of a cassette tape.
.z80 - This is a snapshot of the Spectrum's memory and ROM at a specific point in time - this allows you to instantly return to a program, at the exact point when the snapshot was made.
.sna - Another snapshot format.
.tzx - Another type of image of a cassette tape which can be used to replicate the original tape content exactly
.d80 - A floppy disk image format used by MDOS3
.scr - Screen image files - an image of the screen grabbed from the Spectrum

The following additional formats are not currently supported on the DivIDE Plus
.dsk - An image of a ZX Spectrum floppy disk
.img - An image of a ZX Spectrum floppy disk
.mgt - An image of a ZX Spectrum Plus-D floppy disk
.mfc - An image of a ZX Spectrum Plus-D floppy disk

.mdr - An image of a ZX Spectrum microdrive cartridge

Connect to the Spectrum

Once you have downloaded some files onto your compact flash card, insert it into the back of the DivIDE Plus unit. Switch off your Spectrum.

If you have a Sinclair ZX Spectrum +2A, +2B or +3 computer (all black computers with built in cassette drive or disk drive), then you will need to open the DivIDE Plus case and ensure that the jumper (a small black plastic bar) is across the two metal pins near to the Spectrum edge connector. For all other ZX Spectrum's this jumper must be removed.

If you only plan to use the DivIDE Plus with one type of Spectrum and you are certain that this jumper is in the correct position, you can seal the case together with a spot of epoxy resin - we would suggest one spot in each of the four corners of the case.

Now you can plug the DivIDE Plus into the expansion connector on the back of the ZX Spectrum and also plug a joystick interface into the connector on the top of the DivIDE Plus if you want to use a joystick.

Now you can switch on your Spectrum.

Switch on the ZX Spectrum

As you switch on the ZX Spectrum, if you have not used the Compact Flash card before, hold down the space key - this will force the DivIDE Plus to read the parameters on the Compact Flash card, so it can read it properly.

You will see a DivIDE Plus logo on the screen, and beneath that should appear something like

One Volumes Found....
1. SanDISK 1024 CF
2. None

This shows that the interface has found and identified your compact flash card. If you see corruption in the name of the compact flash card, or the Spectrum does not respond to the keyboard at this point, then you probably have an incompatible Compact Flash card.

Press any key and the Spectrum should then go to the normal Sinclair copyright screen that you would expect to see when you switch on the ZX Spectrum.

Load a Program

You are now ready to load your first program from the compact flash card.

By default, the DivIDE Plus will start using FATware which is the easiest solution to loading and running programs on the ZX Spectrum. However, note that you cannot save to the compact flash card using FATware.

Simply press the small NMI button on the rear of the DivIDE Plus (to the right of the Compact Flash card). This will bring up a file browser menu. Use the keys CAPS SHIFT+6 and CAPS SHIFT+7 to move up and down the list.

Press ENTER to display the contents of a sub-directory, or to select a file.

If you have selected a .sna or .z80 snapshot file, then this will instantly load into the Spectrum.

On the other hand, if you selected a .tap file, then you will need to enter the command:

```
LOAD ""
```

to run the program, as though you were loading it from cassette tape.

Save a Program

At the moment, saving a program from the ZX Spectrum to the compact flash card is more difficult as FATware does not support writing to the compact flash.

In order to save a program, you will need to switch to a different firmware which supports the write mode.

You have the choice of either:
- ResiDOS (medium skill levels)
- esxDOS (medium skill levels – see section on esxDOS below)
- MDOS3 (advanced skill levels only)

Both of these use custom file formats on the compact flash card which means that they cannot natively access the most common ZX Spectrum file formats.

We would however, recommend that you use ResiDOS - this is because you can download and install a TAPEIO package, which then allows ResiDOS to read and write from .tap and .tzx files on the compact flash card.

Using one of the other firmwares

ResiDOS is stored in battery backed memory on the DivIDE Plus and is therefore not installed on delivery. It also appears that ResiDOS will not run on a 16K machine.

You can install ResiDOS easily by downloading the file:

http://www.worldofspectrum.org/residos/files/divideplus/residos.tap

Copy residos.tap onto your Compact Flash card using your PC.

Before you go any further, you may as well also download the TAPEIO package from: http://www.worldofspectrum.org/residos/files/tapeio.pkg

Copy tapeio.pkg onto your Compact Flash card also.

Now plug in the Compact Flash card into your DivIDE Plus and fire up the ZX Spectrum (as above). Press the NMI button to locate the file residos.tap, press ENTER and return to BASIC.

LOAD "" will then install ResiDOS for future use.

From now on, if you want to switch to ResiDOS to use its functionality, use the following command sequence:

```
POKE 18455,237:POKE 18456,65:POKE 18457,199

PRINT USR 18455
```

You can also try the shorter version of this (although the author of ResiDOS recommends the above):

```
OUT 23,104
PRINT USR 0
```

Switching to MDOS3 is much easier, simply use:

```
OUT 23,6

PRINT USR 0
```

Switching to a new firmware takes a few minutes, as the new firmware looks at the Compact Flash card and sets itself up.

We also supply a separate Firmware Selector program which makes this process much easier - it provides a menu when you first start up the ZX Spectrum to allow you to choose the default Firmware, and remembers the setting for the next time.

Install the TAPEIO Package for ResiDOS

We did suggest you install the TAPEIO package for ResiDOS - you should have already copied the tapeio.pkg file to your compact flash. Switch to the ResiDOS firmware as above, and then enter the command:

```
CLEAR 32767
%INSTALL "tapeio.pkg"
```

Once installed, you will not have to do this again unless you manage to corrupt the copy of ResiDOS. The TAPEIO package now allows ResiDOS to load from and save to .tap and .tzx files, for example with the commands:

```
%TAPEIN "manic.tap" : LOAD ""
```

Saving a program / data

ResiDOS can save a program or data direct to the compact flash card in a format which is readable from the PC - simply use the command:

```
SAVE %"filename"
```

much as you would use `SAVE "filename"` to save to a cassette. You can add LINE, CODE and SCREEN$ parameters, as you would normally.

However, if you want to send that file to someone who does not use ResiDOS, for example to use with a PC emulator, they will not be able to read it. With TAPEIO installed under ResiDOS, you can now save to the compact flash card within a .TAP file.

Simply use the commands:

```
%TAPEOUT "new.tap" : SAVE "program" LINE 1 : %TAPEOUT
```

Copy a Program From Cassette

Not all ZX Spectrum software can be downloaded from the internet - some is distribution denied, and you will therefore need to make your own copies of the program from cassette onto Compact Flash card.

To do this, you will need to use ResiDOS and download and install another package - the TaskManager.

The TaskManager package can be downloaded from :
http://www.worldofspectrum.org/residos/files/taskman.pkg

Again, copy taskman.pkg to your Compact Flash Card, start up the Spectrum with ResiDOS as the firmware and enter the command

```
CLEAR 32767

%INSTALL "taskman.pkg"
```

Now you can load a program from cassette in the normal way. Once the program has loaded, press the NMI button on the rear of the DivIDE Plus interface to enter the task

manager menu. Press S to save a snapshot of the current program loaded in the Spectrum to the compact flash card.

The snapshot can later be loaded either using FATware or with the command:

```
%SNAPLOAD "filename.z80"
```

(although we have found that some files created in this way will not later load under FATware, they do load under ResiDOS).

Copy a Program To/From Disk

This is slightly more complex. At the moment, only the ZX Spectrum +3 is able to do this, although the author of the +DivIDE firmware has successfully managed to connect both the DivIDE Plus and PlusD disk interfaces at the same time and copy files between the two.

Again, you need ResiDOS running on the ZX Spectrum.

If you want to copy files to / from a .tap or .tzx file on your Compact Flash card, then you will need to download and install the TAPEIO package as above.

You can then use commands such as:

```
%TAPEIN "paw.tzx"

%TAPEGET
```

(This will transfer all files with headers from the paw.tzx file to disk, naming the files on the disk accordingly.)

You will also need to copy all headerless files across to disk with the commands:

```
%TAPEWIND

%TAPELIST                    (get a list of all files on the tape file)


%TAPEBGET+"diskname"
```

(this will copy a headerless file across to disk, retaining all parameters, with the specified disk filename in 8.3 format. Repeat this command to copy across all headerless files).

Finally, redirect standard LOAD commands to the disk

```
%TAPEIN
```

Another option is to obtain and install a +3e ROM set for the DivIDE Plus into your ZX Spectrum +3 (we can supply these for you for an extra charge). You can then create a partition on your compact flash card from your PC (or use another compact flash card).

Once you plug the compact flash card into your Spectrum, switch to ResiDOS. Check where your new partition is identified - hopefully as unit 1 (or unit 0 if you just used a new compact flash card).

You then need to create an IDEDOS partition on the compact flash card with the commands:

```
%PARTITION "1>games",2
```

will create a 2MB IDEDOS partition on your Compact Flash card (presuming unit 1 was identified as the new partition). If using a new compact flash card, then simply use:

```
%PARTITION "games",2
```

Check that this has worked correctly with the command:

```
CAT TAB
```

Once the partition is created, you can then move files between your disks (drive A:) and your compact flash (drive B:) with the commands:

```
COPY "a:*.bas" to "b:"
```

or similar.

Using esxDOS

esxDOS is the latest firmware written for the DivIDE and DivIDE Plus. It is quickly gaining popularity and has plenty of features:

- Full FAT16/FAT32 read/write support (no 64K clusters, no extended partitions, no LFN).
- Virtual Disk support (up to 4 devices)
- Betadisk/TR-DOS emulation using (trimmed) .TRD files
- Provides extended BASIC commands
- BASIC files integration using +3DOS headers for FAT filesystems
- Support for seamless IM2 loading/saving, from BASIC and machine code
- System commands loaded from /BIN dir of system drive
- TAPE emulator supports reading/writing from/to TAP files. TAP attaching functions are available to external programs.
- POSIX-based API usable by .commands, external programs and NMI.SYS. Functions available on rst $08: open, read, write, close, opendir, readdir, seek, sync, fstat, getcwd, chdir, unlink...
- Possibility of getting absolute LBA sector and device on an opened file (for direct I/O)
- Kernel loads modules (.KO files) on demand
- NMI.SYS support (NMI system is independent, ESXDOS kernel just provides services)

In order to install esxDOS on the DivIDE Plus, you will need to either have purchased your DivIDE Plus from RWAP Software after January 2013, or install the upgraded GAL set.

We will then provide you with a link to a specialist installer containing the latest version of esxDOS – this is different from the files available for the standard DivIDE, so you have to be certain that you install the correct version.

Troubleshooting

The Spectrum will not Start up with the DivIDE Plus

Unfortunately, some ZX Spectrum's have a cheap Z80 processor which does not include the M1 line required by the interface. In that case, you will need to replace the Z80 Processor.

However, before jumping to that conclusion, some simple maintenance may help resolve the problem. You need to open the ZX Spectrum case and clean the edge connector with a pencil eraser and then some alcohol - remember to clean both sides of the motherboard!. Allow this to dry before plugging in the DivIDE Plus.

My Compact Flash Card is not recognised

Unfortunately, some Compact Flash cards are better than others - you may have an incompatible card - contact us so that we can check this for you. Some guidance appears on our website at:
http://www.rwapsoftware.co.uk/spectrum/spectrum_storage.html

Problem Games

Some programs use a peculiar loading scheme which can cause them to fail to load from compact flash card. You can get around the majority of these programs by entering the command:
`OUT 32765,48`

before you use the `LOAD ""` command.