



SparQ

Parallel printer port driver and Software for RISC OS

ProAction

3QD
DEVELOPMENTS LTD

APDL

SparQ Parallel Port Driver & Software

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User Guide for Syquest SparQ parallel port drive system

Introduction

The APDL SparQ parallel port system allow RISC OS to use low price external Parallel Port SparQ drives as RISC OS hard discs. SparQ drives use 1Gb cartridges. Whilst a 1Gb capacity is very small for a Windows storage device RISC OS needs far less storage space. The author has been running the same RISC OS install (moved from one machine to another) for over 20 years and it's nowhere near 1Gb in size.

Although this software is functional and stable the original developers had hoped to make some changes to it. However it's now very unlikely that any further changes will be made due to the death of the principle developer. As we are aware there are no serious problems with the driver and software suite and data saved to a drive is perfectly secure and remains uncorrupted.

We do remind the user that they should always keep at least 1 backup of any data that's important. Whilst it is possible to use a SparQ drive as the main hard disc for a RISC OS machine we don't recommend this because the software will need to be loaded from floppy each time before the SparQ drive can be used and it won't be possible to print using the Parallel Port whilst using the SparQ drive.

Installing the Hardware

We recommend connecting the hardware with the computer switched off.

- Plug the mains lead into the power supply and plug the DIN plug into the socket in the rear of the SparQ drive.
- Connect one end of the data lead to the computer's printer port and the other end to the socket marked 'to computer' on the rear of the drive. Your printer can now be connected to the port marked 'to printer' on the rear of the drive.
- Switch on the power at the SparQ on/off switch which is at the rear on the right hand side. Then turn on the computer.
- Insert a disc into the drive. Make sure it is pushed right in and firmly down to engage with the mechanism. The green light on the front of the drive should flash and then, after a few seconds, stay on indicating that the drive is ready.

Installing the Software

On RISC OS

Just double-click on the !BootSparQ application. This may be run from floppy disc or you can copy it to a suitable location on your hard disc.

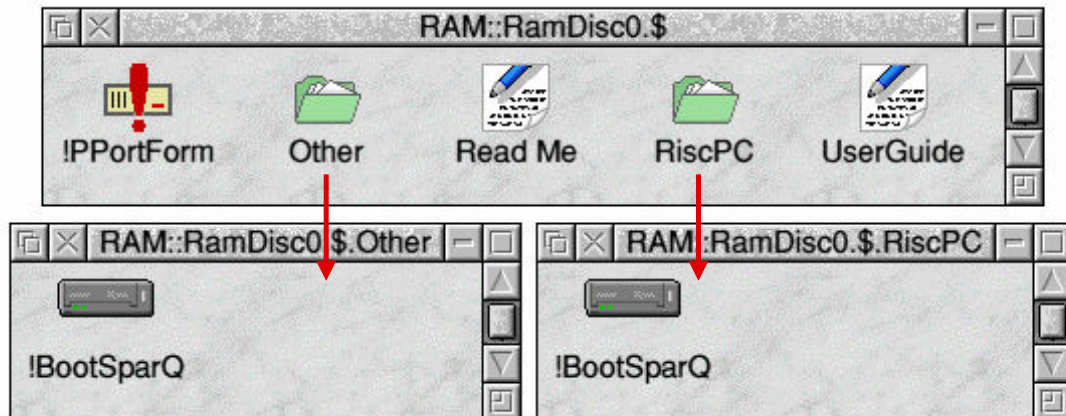
On a PC

The software supplied by Syquest is suitable **only** for use with DOS, Windows 3.1, Windows 95 and NT. If you are using Windows XP then this software won't work. However APDL do have a later driver which works with XP and this can be downloaded from the APDL web site.

Note that I'm not sure if either driver works on Windows 98 or 2000 and although I've been told that the later software works with Vista (or later versions of Windows) I haven't actually tried it.

Using the parallel port software

Connect the drive as described and run !BootSparQ. There are two different versions included, one version for the RISC PC and one for other machines. Make sure you use the correct version for your machine.



A 'Command Window' will open and this will display the registration number of the software and describe progress while the program searches for devices connected and tries to 'mount' the disc. This will then clear and the appropriate drive icon(s) will appear. If the disc does not have a valid format then the drive icon will be 'greyed out' and you will need to run the !PPFormat program to format it before it can be used.

The drive is used just like any other under RISC OS. To remove a disc click on 'Dismount' on the drive menu and then press the 'eject' button on the front of the drive. Note that until you click on 'Dismount' the eject button will be ineffective. Insert the new disc, wait until the green light has stopped blinking, and the new disc is ready to use.

When inserting a new disc make sure you insert it carefully and that the disc is not inserted at an angle into the drive. If you insert a disc out of square the disk may not be detected correctly and if a disc is repeatedly inserted at an angle both the disc and drive could be damaged. Sometimes inserting the disc with both hands helps ensure that it's inserted squarely.

Sometimes when you first click on the drive icon after changing discs an error box may appear but without any error message. Just close the error box and try again and it should be OK.

If the drive icon is 'greyed out' this implies that the disc cannot be read. This may be because it is unformatted or because it is corrupt or has been formatted with a non-standard system.

You will need to run !BootSparq each time you boot your computer so you might want to consider adding it to the RISC OS !Boot sequence. You can do this by **holding down SHIFT** on the keyboard and **double clicking** on **!Boot**. Open the folder **Choices.Boot.Tasks** then **drop** a copy of **!BootSparQ** into the **!Boot.Choice.Boot.Tasks** folder.

Now reboot your machine and make sure it boots correctly and that BootSparQ runs.

Printing

You must select 'Dismount' from the drive menu before you can print as the printer can't use the printer port while the driver software is using it. Don't forget that ANY drive access will re-mount the drive, even using 'Free', and you'll have to Dismount it again. If you forget you will get an error message and you can click on 'Cancel', Dismount the drive, and try again.

Because you have to Dismount a drive before printing it is not possible to print directly from a printer-port drive. If you need to print a file that's on a parallel port disc just copy it to your hard disc (or a RAM disc), select 'Dismount' from the ParPortFS filer menu, and then print the file.

Password protection

This enables a drive or partition to be protected by a password. There are three levels of protection, Read Only, No Access and Read/Write.

Read Only means that data can be read from the drive but nothing can be Saved to it and existing files cannot

be altered or deleted. This is useful for protecting files from accidental or unauthorised alteration or deletion but it does not stop them being loaded or programs from being run.

No Access stops all access to the drive, and you will have to enter the correct password when you click on the drive icon before you can access the drive.

Read/Write enables all normal drive access. As you need to know the old password in order to set a new one, if you set Read/Write protection this effectively stops anyone else (accidentally or deliberately) setting up protection to stop you getting access to your drive.

You must enter a password twice. This is to ensure you have typed it correctly as once a password is set up it will not be possible to unprotect the drive without using it.

When you set up a password it only takes effect the next time the computer is switched on.

Make sure you don't forget your password. If you do you will not be able to use the drive. It is possible to disable password protection but it is very difficult and can only be carried out by our engineers. If you forget your password we may be able to unprotect the drive for you but we reserve the right to charge for this service.

Use of Password Protection

As well as the more obvious uses this, in conjunction with partitioned drives, is especially useful in schools. If a drive is divided into two partitions and Read Only protection set on one and Read/Write on the other you can then put all your applications, fonts, and other fixed data onto the Read Only partition where it cannot be altered or deleted by pupils. !Scrap and any other data which needs to be changed or modified can then be placed on the other partition.

Unlike most protection systems this is very difficult to circumvent, but make sure your pupils don't know your password and that you don't forget it!

Simple Formatting on RISC OS 3.6 & later

Important. Before you attempt to format or re-format a disc please read the section Problems with older machines at the end of this manual.

Formatting a disc

The !PPortForm program is used to format discs. This is a non-desktop program and is based on the formatter for our IDE interface. This makes it extremely versatile and it has many more features than most users will ever need. It will be described in more detail later, but at this stage I shall briefly explain how to prepare a 'normal' removable media disc for use.

With a removable drive put the disc you want to format in the drive and wait until the green light stops flashing. Now run !PPortForm. When the Menu appears select Option 6 'Initialise all partitions'. You will be asked if you want to make the disc 'bootable', so press 'N' for No, then you will be asked to confirm that you actually DO want to initialise the disc, so just press 'Y' for Yes. When the disc has been initialised the menu will re-appear and you can select Option 9 to return to the desktop.

Discs are given a name based on time and date so it is most unlikely that you will find two discs with the same name. You can, of course, rename them from the Drive Menu, and most people will want to do this, but you should ensure that ALL discs are given a unique name, otherwise the filer could become confused when they are changed.

Checking for defects

Sometimes discs do develop defects. As discs used in removable media drives are not sealed they may sometimes imbibe small dust particles that can lead to a defect. The desktop multi-tasking Verify is OK for checking if a drive or partition has defects, but it is of no practical use, so it's best to do this from the command line rather than the desktop. Press F12 and type:

```
ParPortFS    Verify :4
```

to verify the first partition. The drive will be verified and any defective sectors will be shown. Sectors which required a retry will also be shown, and it is best to treat these as defects. The command to map out a defect is:

```
Defect <drive number> <address>
```

The verify command returns the disc address of any defects found so you can use this to map them out. To save typing the address (and possibly making a mistake) you can use the COPY key (marked 'End' on later machines) to 'split' the cursor and copy the address. If there is a file using the defective sector then it can't be mapped out, and you will be told the name of that file. If you can't move the file, and this should be possible if you are trying to map out a 'retry' but probably not if it's an actual defect, then you will have to delete it before you can map out the defect.

Formatting with Partitioning

This section describes more advanced use of the !PPortForm program, including partitioning drives.

What are Drive Partitions?

The ParPortFS system supports hard drive partitions. This is nothing to do with 'PC partitions' used by PC cards or emulators and alternative operating systems like ARM LINUX and RISC BSD but a way of dividing up a large 'physical' drive into several partitions or 'logical' drives. There are three reasons why you may want to do this.

1. With operating systems before RISC OS 3.6 the maximum drive size permitted is 512 Mb. Chopping up bigger drives into a series of partitions enables large drives to be used on earlier OS's.
2. Each partition can be protected by a password. This is useful if more than one person uses the computer or you have confidential data on your disc.

First you must understand the terms *physical drive* and *logical drive*.

A physical drive is an actual hard disc. A logical drive is a drive as it appears to the operating system and to the user. In the RISC OS desktop it's a drive icon on the icon bar. ParPortFS supports up to eight logical drives so you could have up to eight ParPortFS drive icons. This is far more than would normally be required but it does allow very large drives to be used with pre RISC OS 3.6 machines.

Partitions and removable drives

Because of the problems that partitioned removable discs can cause you are strongly advised NOT to partition removable discs under normal circumstances. A lot of confusion could be caused if you replace a disc with two (or three or four) partitions with a 'normal' disc with a single partition!

The obvious exception to this is if you want to use the system with a machine which has an OS before RISC-OS 3.6. With these machines the largest drive that can be used is 512Mb. You must therefore either format the disc to 512Mb or less (in fact, this means create a single partition of 512Mb) or split it into two partitions.

If you use just one partition then the disc will be readable (in theory) in a drive used under any other Acorn system, eg. a Cumana parallel port drive, or an IDE drive connected to any Acorn IDE interface. If you use more than one partition then only the FIRST partition will be visible to other filing systems. All partitions will be usable if you use the disc in an IDE drive connected to an APDL ideA interface, but to ensure they all appear it will probably be necessary to reset the computer after inserting the disc or to put the disc in the drive before switching on the machine.

Using the PPortForm program

Although it is called a formatting program modern drives are actually formatted by the manufacturers and all that is necessary is to write the Boot Block, Map, Root Directory structure and other essential data to the drive. This is called 'initialising' and takes only a couple of seconds.

When you run the program it will display the characteristics of the selected drive. You will then see a menu with the following options:

1. Add new partition to table
2. Delete partition from table
3. Edit drive parameters
4. Change drive interleave
5. Clear bad blocks
6. Initialise all drive partitions
7. Initialise ONE drive partition
8. End

Instead of describing these individually I will go through the process of initialising a new, unformatted, 1 GB disc drive with two partitions, one of 320Mb and one using up the rest of the available space.

First select Option 1. The program will inform you how much space you have available to allocate, and with a 1 GB drive this might be something like 988 Mb (drives sizes are nominal). Enter the size of the first partition, 320, and press RETURN. You will be told that you have 668 Mb available (988 minus 320). Enter 688 and press RETURN again. The program will now tell you that you have 0 mb left (it's all been used up) so just press RETURN and the menu will come back again.

Now select 6 to initialise the drive partitions. You will be asked if you want the drive to be 'bootable'. It is unlikely you would want to 'boot' from a parallel port drive, if you really want to do so it is possible, but you would normally enter 'N'.

You will next be asked if you want a RISC OS 4 style format with long filenames. If you are using the drive on any OS version less than 4.02 you should enter 'N', otherwise enter 'Y'.

You will see various messages as the partitions are initialised and then, when the menu re-appears, select 9 to finish.

In this example, as you have partitioned the drive it is best to quit the parallel port software and re-run it so that it can re-initialise itself with the correct drive icons.

As you can gather, if you had wanted to have just a single logical drive you would have entered the full drive size for the first partition.

Warning If your computer is fitted with an OS less than 3.6 do not attempt to create a partition greater than 511Mb. PPortForm may appear to create and initialise the partition but it is larger than the maximum permitted for these machines and will cause serious problems as the drive fills up with almost certain loss of data.

Drive names

As has already been described you can set the name of each drive or partition from the drive menu. Each drive must have a unique name or the computer will be unable to distinguish between them and you will constantly get 'Ambiguous disc name' errors.

The PPortForm program assigns default drive names based on the day and time of day rather like formatting a floppy disc. The name is in the form

<day><hour><minute>-<Partition number>

For example, a drive with three partitions formatted on Tuesday at 10.27 would have the partitions named -

**Tue1027-4
Tue1027-5
Tue1027-6**

This isn't particularly elegant but most users will want to rename them anyway. It does serve the main purpose which is to ensure that removable discs are given unique names.

Partitioned discs on other filing systems

The partitioning system used by ParPortFS is identical to that used by the APDL ideA IDE interface. Partitioned discs can therefore be moved between these two systems without problems. Unpartitioned discs have a 'standard' Acorn format and can therefore, in theory, be used with any other Acorn filing system. This will only be of interest if you have a SparQ internal IDE drive fitted to another computer.

If you do partition a disc then, should you move it to another filing system only the first partition will be visible. This can be used normally without problems.

Deleting a partition

This option is used to remove a partition. If a drive has been formatted and you wish to change the number or size of the partition(s) you will have to use this to remove the old partitions before you can install the new one(s). Note that altering the partition table normally means you will have to re initialise the drive and lose all the data on it.

Clear bad blocks

This will verify the drive and swap any blocks which return errors with spare blocks.

Edit drive parameters

This is used to change the drive parameters from the standard values for the drive. Unless you are sure of what you are doing you should not alter any of these.

Change drive interleave

Almost all modern drives are set to use a 1:1 interleave and this will be suitable for most computers. On older machines or with very old drives it may be possible to speed up data transfer by altering the interleave but unless performance is disappointingly slow it is unlikely that it will have any effect. With some drives this can completely wipe all data from the drive so you will need to repartition and initialise it.

Initialising a single partition

Normally you would only want to initialise partitions when you first install a drive, and you would then want to initialise them all. However, there may be times when you would want to initialise just a single partition, for example, if you no longer want any of the data on a partition then it is quicker to re-initialise it (wiping out all the files) rather than deleting them, or you may have a 'broken directory' which can be difficult to remove by other means.

When using this option be absolutely sure you are selecting the correct partition to initialise. If you choose the wrong one you will be unable to recover the data.

Partitions are identified by number, starting at 1. To equate this to the drive icon, partition number 1 would be the right hand icon, number 2 the next icon to the left, icon 3 the next, and so on.

Reading DOS format discs

Sometimes this feature doesn't work and a DOS format disc will appear unformatted, ie. the drive icon will be greyed out. This can usually be solved easily by dismounting the disc and then remounting it. Sometimes it's necessary to physically eject the disc from the drive after dismounting it. The disc should then read correctly.

Please note that you should not store RISC OS format applications or files on a DOS formatted disc because filenames can be truncated and RISC OS filetypes can be lost.

Problems with older machines

Drive Parameters on non RISC PC machines

On all machines other than RiscPCs there is often a problem reading the drive parameters when formatting a disc. This can cause the !PPFormat program to fail to work properly or to attempt to use the wrong parameters.

For this reason we strongly advise that you should check and, if necessary, alter these parameters *before* you actually try to initialise the disc, even if they appear correct.

To do this select Option 3, **Edit drive parameters** from the menu. This will offer the main parameters the program needs to know, one at a time. If these are correct, just press **RETURN**. They should be as shown below, if any are different then enter the correct value before pressing **RETURN**.

```
Logical block mode  0
Sectors per Track   63
Heads               16
Cylinders           1945
```

This should give a total capacity of 957 Megabytes

A3010, A3020 and A4000

The software normally works perfectly on these machines (though see note 'RISC OS 3.1 problems' below). We would normally suggest using the version from the 'Other' directory but most people experience no problems using the RiscPC version which is slightly faster.

A5000

On some machines it is not possible to format a disc, although once formatted on another machine they appear to work OK. This is a problem with the chip used to drive the parallel port. Acorn sourced these from different manufacturers and although they are (in theory) all to the same spec some appear not to be able to supply sufficient drive current for high speed data transfer. In fact some A5000 machines have trouble driving certain laser printers for the same reason.

Normally reading and writing to the disc is OK.

RISC OS 3.1 and 3.5

As these operating systems don't support hard drives larger than 512 MB it is obviously not possible to use a 1 GB disc in one 'chunk'. As the software supports partitioning if you want to use all the disc you will need to divide it into two partitions, both of which must be less than 512 MB.

There is also a problem with the desktop Verify application with RISC OS 3.1. This doesn't seem to work properly with these drives. However you can easily check a disc by verifying it from the command line. To do this you will have to use the method described on Page 6 under *Checking for defects*.

Here are just a few of the other products you will be able to
download from RISCOS.com free of charge
(You can make a donation to help support future product releases but this is entirely voluntary)



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