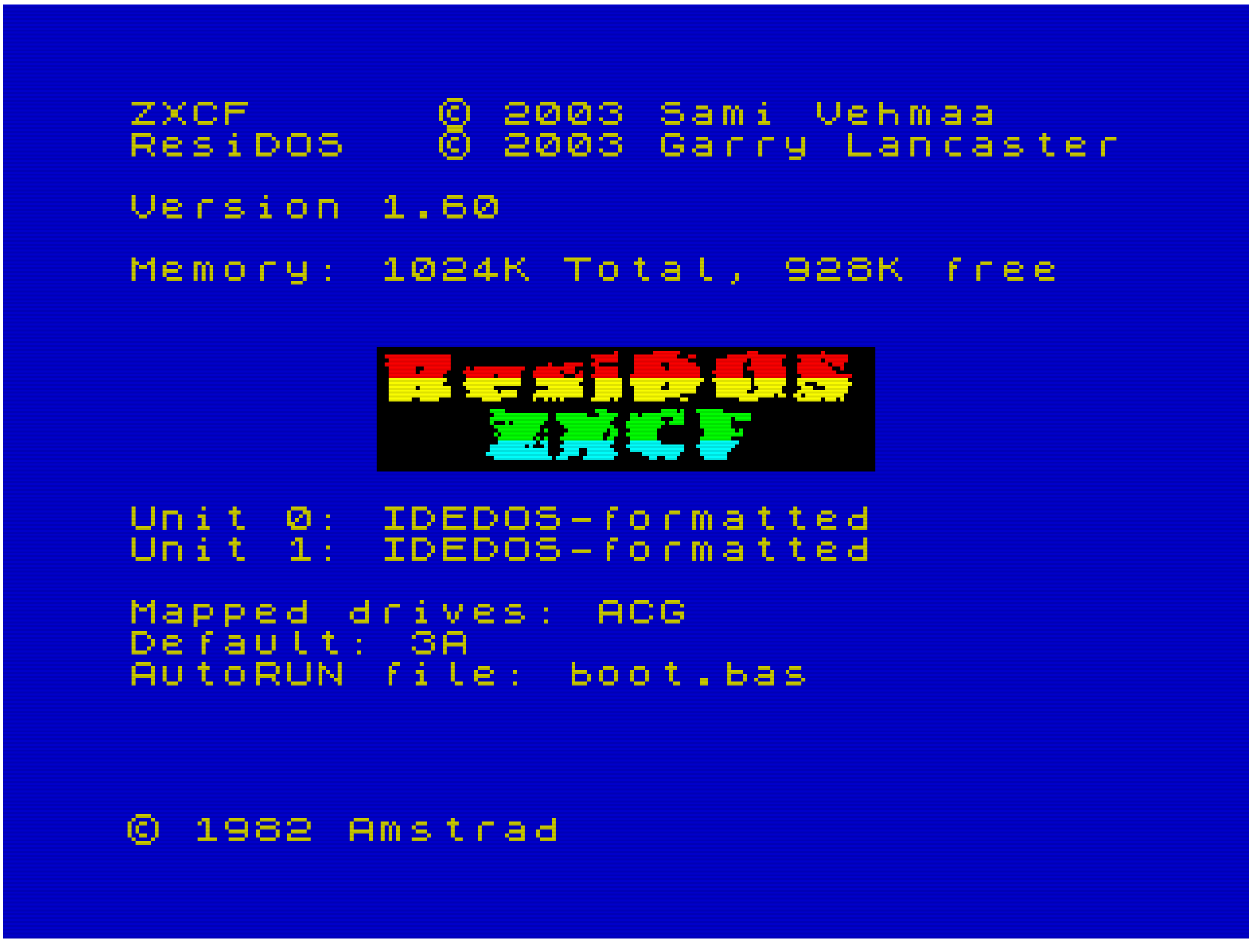
The ResiDOS User’s Manual



```
ZXCF        © 2003 Sami Vehmaa
ResiDOS     © 2003 Garry Lancaster

Version 1.60

Memory: 1024K Total, 928K free
```

```
Unit 0: IDEDOS-formatted
Unit 1: IDEDOS-formatted

Mapped drives: ACG
Default: 3A
AutoRUN file: boot.bas



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```

Introduction

ResiDOS is an extension to ZX Spectrum BASIC that operates with either the ZXATASP IDE/compactflash interface or the new ZXCF compactflash interface. Both interfaces were designed by Sami Vehmaa.

ResiDOS installs itself into your interface's onboard RAM together with a modified copy of the Spectrum ROM, and then provides you with extra BASIC commands for accessing files on the hard disk or compactflash card, and using the extra RAM on your interface. It also provides a comprehensive *task manager* which can be reached using the NMI button and allows you to instantly switch between a number of programs or games running on your Spectrum.

ResiDOS Installation

Installing for the first time

Installing *ResiDOS* is simple. First download the appropriate version of the installation software for your interface from the downloads page and load it into your Spectrum. The software is provided in the form of an emulator TAP or TZX file, so you will need to transfer it using software such as *playtzx* or an emulator. You'll find suitable software on the World Of Spectrum site. Once it's transferred, just LOAD it into your Spectrum and follow the simple on-screen instructions.

During installation, the program will confirm the size of your interface's RAM (usually 128K, 512K or 1024K) and give you two main options.

The first option is to use the standard ROM or an alternative one. Using the standard one means that your Spectrum's existing ROM will be copied into the interface RAM and modified. If you select an alternative ROM, you will be asked for a filename to LOAD in containing the ROM image. This allows your interface to start up with a different ROM; for example you might choose SE BASIC.

The second option allows you to decide whether the NMI button will have any effect. You should enable this unless you have a specific reason not to (if, for example, you are using an alternative ROM that has it's own NMI routine that you would prefer to use). If you enable the NMI, then you will be able to use the powerful ResiDOS Task Manager.

Once you have made your choices and changed the jumpers on your interface as instructed, the Spectrum will reset and you should see the *ResiDOS* boot screen appear!

Upgrading to a new version of ResiDOS

When a new version of *ResiDOS* becomes available, installation is even easier. Just load the installation program from tape as normal, and it will automatically detect your existing version. You can then choose to upgrade, and the system will be automatically updated, leaving all your installed ROMs and tasks still in the interface's memory.

If you choose to re-install, the normal installation procedure will occur. This will wipe all the ROMs and tasks from your interface's memory.

Note that the upgrade will only work if you already have *ResiDOS* version 1.20 or higher already installed, since earlier versions cannot be detected.

Setting up your hard disk or CompactFlash

Before you can use your hard disk or CompactFlash, it needs to be initialised with the IDEDOS system. ResiDOS can work with two different physical drives, normally known as the "master" and "slave" unit; in all the following commands, the first number given identifies the unit number, which is 0 for the master and 1 for the slave.

The first thing to do is make sure that *ResiDOS* understands the structure of your disk. Normally, it automatically detects this and displays the details on the boot screen. However, if for some reason this doesn't work, you can manually specify the parameters (shown on the drive itself, or to be found on the manufacturer's website) with the following command:

```
FORMAT %0,977,10,17
```

(The above command assumes your hard disk is the master drive (unit 0) and has 977 cylinders, 10 heads and 17 sectors). Once you have entered this command, the details are permanently stored in your interface's RAM.

You can re-enable auto-detection for the master drive (unit 0) with the command:

```
FORMAT %0
```

If you want to disable detection of a drive altogether, to save a bit of time on boot, you can do so with the following example command, which disables detection of the slave drive (unit 1):

```
FORMAT %1,0,0,0
```

When you're sure that *ResiDOS* knows the correct details, you need to initialise the disk. **Note that doing this erases everything currently stored on the disk**. The command to use is:

```
FORMAT % ERASE 0,15
```

This initialises the master drive (unit 0), allowing up to 15 partitions to be created. You can specify any number you like for the number of partitions, but note that the more you allow, the slower certain partition management commands will be. Each partition can be up to 16Mb in size; I'd recommend calculating the number you would need to completely fill the disk, and adding several more for a bit of elbow-room. So, a 1Gb disk could use about 1000/16=63 partitions, and you might wish to specify around 80.

Once the disk is initialised (you only ever need to do this once) you can use the partition management commands to add some partitions for storing your files.

Switching disks or CompactFlash cards

To switch to using a different hard disk or CompactFlash card, you can use the following command:

FORMAT %

This will unmap all existing drives and re-detect your disks/cards, automatically mapping any drives back again as it would do on boot. Your BASIC program and all other data will be unaffected by this process, so it's a very useful command for transferring files from one CompactFlash card to another.

Note that once your disk is initialised, *ResiDOS* stores its details (about cylinders, heads, sectors etc) on the disk itself, so when swapping disks or CompactFlash cards there is no need to set these details again.

Partition Management

The IDEDOS system used by *ResiDOS* allows you to divide your hard disk up into many separate *partitions*, which can each be assigned to a drive letter and used for storing files. You can have as many partitions as you like on your disk, but currently there are a maximum of 6 that can be assigned to drive letters at any one time.
Partitions can be one of two types: "data", for holding files; and "swap", for use as temporary workspace by programs or the operating system. Other types may be added in the future. Note that no programs currently require swap partitions, but there is no harm in creating one for future use.
Commands exist to allow you to create and delete partitions and assign them to drive letters. Unlike some inferior operating systems, this can all be done from BASIC, and there is no need to reset your Speccy at any point!

Creating, deleting and listing partitions

You can create a partition using one of the following commands, which create data and swap partitions respectively:

- **FORMAT % DATA "*name*",*size***
- **FORMAT % EXP "*name*",*size***

To identify which unit (master or slave) a partition is to be created on, the number can be included at the start of the name, followed by the unit number (eg "0>Documents" or "1>Games"). If you don't specify the unit, then the master drive is assumed. Names can be up to 16 characters long (this doesn't include the unit identifier) and are not case-sensitive.

The size for a partition can be given in kilobytes (K) or megabytes (MB), with a maximum size of 16 megabytes allowed. A number smaller than 256 is assumed to be a size in megabytes; a number larger or equal to 256 is assumed to be a size in kilobytes.

You can delete a partition, together with any files that are stored on it, using the command:

- **FORMAT % BIN "*name*"**

A partition can only be deleted if there are currently no drives mapped to it.

You may also rename a partition, using the following command:

- **MOVE % "*unit>name*" TO "*newname*"**

Note that you *must* include the unit identifier for this command, otherwise it will assume you want to rename a file, not a partition.

Finally, you may display a list of partitions, in a normal or expanded form, using the following commands:

- **CAT % TAB**
- **CAT % TAB EXP**

Mapping drives to partitions

Before you can access files on a data partition, you must *map* it to a drive letter. Up to 6 drive letters can be in use at a time, and you can use any drive from A: to P:. By default, *ResiDOS* saves and loads files to drive A:, so you may want to map your most frequently used drive to this letter (however, it is also possible to change the default drive to something other than A:).

When mapping a drive to a partition, you can make the assignment permanent, which means that *ResiDOS* will automatically make the same assignment every time the Spectrum starts up. This is done by adding the ASN keyword to the end of the mapping command.

The commands to map drives to partitions are:

- **MOVE % "*drive*:" IN "*name*"**
- **MOVE % "*drive*:" IN "*name*" ASN**

Similar commands are available to remove mappings from drives. Using the ASN keyword here means that any permanent assignment associated with the drive will also be removed:

- **MOVE % "*drive*:" OUT**
- **MOVE % "*drive*:" OUT ASN**

Finally, you can obtain a listing of the current drive mappings with the following command:

- **CAT % ASN**

Using files in ResiDOS

The filesystem used by *ResiDOS* is the same as that used by the *ZX Spectrum +3*, *ZX Spectrum +3e* and various *Amstrad* computers, and is a version of the popular CP/M filesystem. If you are using a +3e, then you can use the same disk and files with *ResiDOS* as with +3e BASIC.

Filenames

Filenames consist of an 8-character name, optionally followed by a full stop (**.**) and an extension of up to 3 characters. The characters allowed are:

- letters **A** to **Z** (upper- or lower-case; there is no distinction)
- numbers **0** to **9**
- the following characters: **" # $ ' @ ^ _ { } ~ `**

Although extensions are not needed by BASIC or *ResiDOS*, you may find it helpful to name files in a consistent way, so that all BASIC programs have an extension of **.BAS**, for example.

As well as the filename itself, you can specify a drive letter followed by a colon (**:**) to identify which drive the file is stored on (A: to P:); if this is not done, then the default drive will be assumed (this is drive **A:** unless you change it).

Finally, you can also specify a *user area* number just before the drive (if you don't, then the default user area - usually 0 - is assumed). The user area can be between 0 and 15. This facility allows you a sort of primitive directory system on each drive.

Some example filenames are:

- prog
- TEST.BAS
- c:puzzle
- 5e:screen.scr
- test21.z__

Wildcards

Some commands can have wildcards provided in their filenames. These are used to match multiple files. The following wildcard characters are allowed:

- ***** matches any sequence of characters
- **?** matches any single character

Wildcard characters can be used in either the name or extension part of the filename. Some examples are:

- *.*
- *.bas
- c:test.b??

Setting the default drive and/or user area

You can set the drive which is used by default to any you like; if you don't use this facility, then *ResiDOS* will use **A:** as the default drive, and **0** as the default user area. To set the default drive and/or user area, use the commands:

- **LOAD %"c:"**
- **LOAD %"3:"**
- **LOAD %"5d:"**

As these commands show, you can alter the default drive without affecting the default user area (and vice-versa), or you can set both together. You can use the **SAVE** keyword instead of **LOAD** if you like; it doesn't make any difference.

If you wish, you can make your preference permanent by adding the **ASN** keyword to the end of the command. For example, to make E: the default drive, and have *ResiDOS* remember this preference every time you switch on, use:

- **LOAD %"E:" ASN**

Note that it is not currently possible to change the default user area from 0, although this may be possible in future.

LOADing and SAVEing files

You can load and save files to and from the hard disk or CompactFlash card using the standard **LOAD** and **SAVE** syntax, but adding a **%** sign after the command name. For example:

- **SAVE %"hello.bas" LINE 10**
- **LOAD %"piccy" SCREEN$**

Note that *DATA* files are not currently supported, although BASIC programs, *CODE* files and *SCREEN$* are.

If you attempt to **SAVE** a file when one already exists with the same name, the existing file will be renamed by changing its extension to **.BAK**, before the new file is saved. If there was an existing **.BAK** file of the same name, it will be automatically deleted.

Additionally, snapshot files saved by the Task Manager can be reloaded using the command:

- **LOAD %"snapname" RESTORE**

Changing BASIC auto-run status

It is not possible to **MERGE** files in *ResiDOS*, but you can change whether or not a BASIC program auto-runs, using the **LINE** command:

- **LINE %"filename",line**

If you specify a line number of 0, then the BASIC program will no longer auto-run.

Cataloguing files

To show a list of all files on the current drive in the current user area, use:

- **CAT %**

You can also specify a string containing a drive, or a drive and user area, to see files in that particular location (otherwise the default drive and user area are assumed). The string can also contain a filename or wildcards, and will display only those files which match the string.

Additionally, you can add the **EXP** keyword at the end of the command to show all files (including system files, which are normally hidden) together with the attributes for each file. Some additional information is also given for BASIC and CODE files saved by *ResiDOS*.

Finally, you can specify a stream number, so that you can (for example) print the catalog listing. (This also applies to all other **CAT** commands in *ResiDOS*).

Some examples are:

- **CAT %"d:"**
- **CAT %"15C:"**
- **CAT %"*.bas"**
- **CAT %"e:test.*" EXP**
- **CAT % #3;"c:"**

Note that on some versions of BASIC (notably *SE BASIC*), the **CAT** command has been renamed to **DIR**.

Deleting files

To erase files from the hard disk, use:

- **ERASE %"filename"**

You can use wildcards in order to erase many files at the same time, but be careful if using this facility!

Note that in *SE BASIC*, the **ERASE** command has been renamed to **DEL**.

Copying files

You can make a copy of file to a new file with a different name, or copy one or more files (using wildcards) to a different drive and/or user area. Some examples are:

- **SAVE %"letter.doc" TO "letter2.doc"**
- **SAVE %"*.rom" TO "b:"**
- **SAVE %"0c:*.*" TO "3c:"**
- **SAVE %"manic.sna" TO "e:"**

You can use the **LOAD** keyword instead of **SAVE** if you prefer; the effect is exactly the same.

Renaming files

To rename a file, use:

- **MOVE %"filename" TO "newname"**

This must be a single file (you cannot use wildcards). It is possible to use this command to change the user area for a file (but not the drive), simply by specifying the same name with a different user area.

Changing file attributes

You can add or remove various file attributes from a file (or group of files, using wildcards). The possible attributes are:

- **P** (protected, or read-only)
- **S** (system, or hidden)
- **A** (archive - doesn't have any real use)

Protected files cannot be erased or changed, and system files cannot be copied and are not normally listed in catalogs (only in expanded catalogs). You can add or remove a single attribute at a time, by using a "+" or "-" character, as in the following examples:

- **MOVE %"*.*" TO "+p"**
- **MOVE %"*.sys" TO "+s"**
- **MOVE %"letter.doc" TO "-p"**

Accessing old ResiDOS filesystems

Before v1.40, *ResiDOS* used a very simplistic filesystem. If you have a disk containing this old filesystem, you can still access files on it, by using the **LOAD**, **SAVE**, **CAT** and **ERASE** commands, but adding an extra **%**. For example:

- **LOAD %%"Program"**
- **SAVE %%"screen" SCREEN$**
- **CAT %%**
- **ERASE %%"Jetpac"**

Note that this facility exists in v1.43 only, and is not present in current versions, so if you need to transfer files from an old filesystem please download v1.43 to do this, and then upgrade to the current version when you have transferred all your files onto the new filesystem.

Customising ResiDOS

As well as being able to configure *ResiDOS* to automatically set up drive mappings and default drives when you boot up, you can customise it in other ways.

Custom colours

You can choose custom colours which will be set every time the Spectrum starts up, rather than the usual boring old black on white. To do this, use the normal colour commands, but followed by "%". By using the percentage sign you specify that the current colour scheme (including the new colour you are just setting) will be used whenever you boot. Additionally, you can use the new **ATTR** command to specify all colours together (this is calculated as *ink+(paper*8)+(bright*64)+(flash*128)*). The commands are:

- **INK % n**
- **PAPER % n**
- **BRIGHT % n**
- **FLASH % n**
- **ATTR % n**

Note that because the % sets *all* the current scheme as default, the following examples have the same effect, and set a default colour scheme of yellow ink on blue paper:

- **INK % 6:PAPER % 1**
- **INK 6:PAPER % 1**

AutoRUN files

You can also set an "auto-run" file. This must be a BASIC program (which can do whatever you like) which will run automatically on boot, or just whenever you enter the special **RUN %** command.

To set an auto-run file, use one of the following commands:

- **RUN %"filename"**
- **RUN %"filename" ASN**

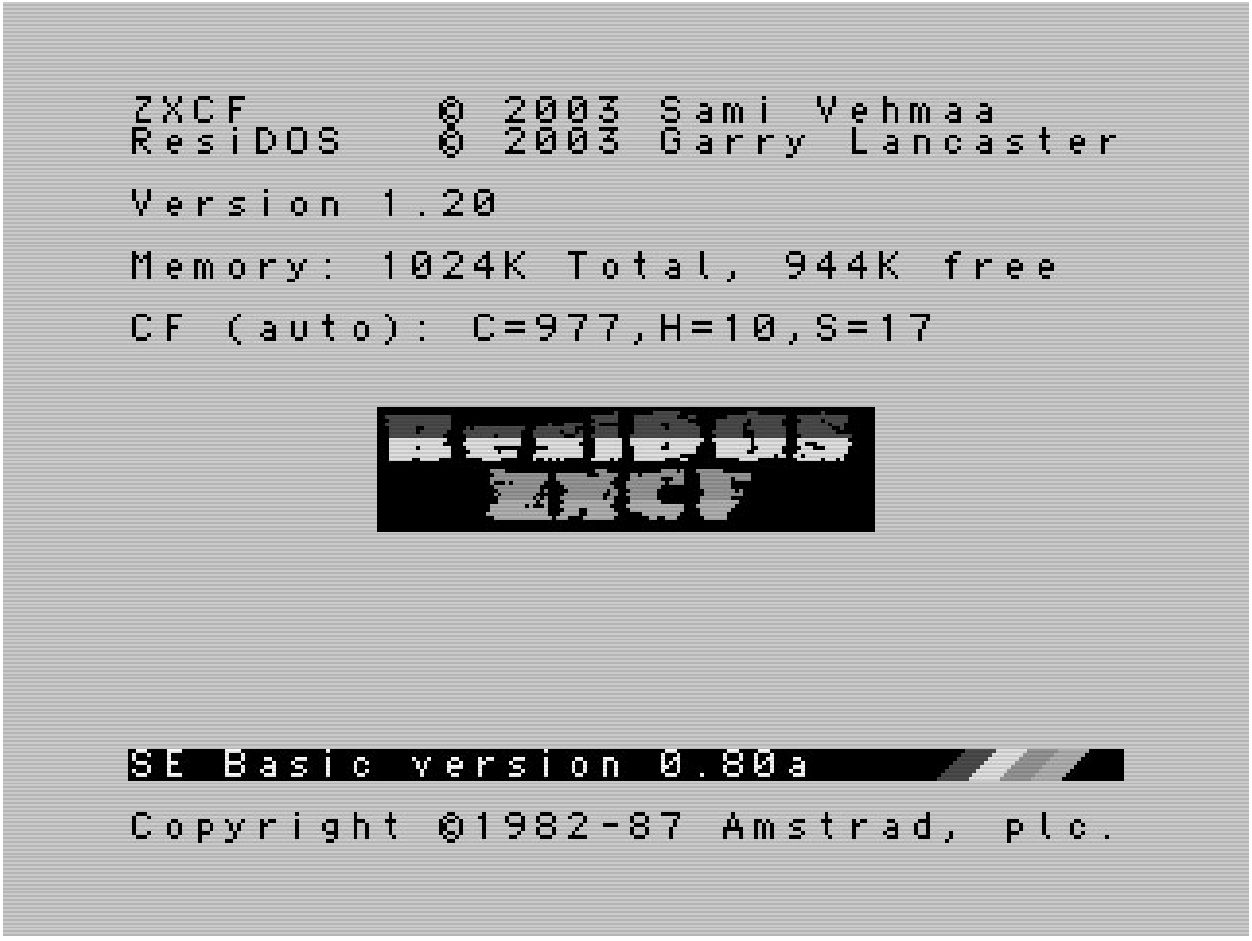
You may specify a drive and/or user area with the filename (otherwise the defaults will be assumed). These two commands differ, because with the second case, the auto-RUN file will automatically be loaded every time you reset (or NEW) your Spectrum. The first command stores the filename, but will not load it unless you enter the following command:

- **RUN %**

Note that you can hold the CAPS SHIFT key down when booting to stop drives from being automatically mapped, so any auto-RUN file will not be able to be loaded.

You can disable the auto-RUN file with the following command: **RUN % ""**

Using alternative ROMs in ResiDOS



```
ZXCF       © 2003 Sami Vehmaa
ResiDOS    © 2003 Garry Lancaster

Version 1.20

Memory: 1024K Total, 944K free

CF (auto): C=977,H=10,S=17
```

```
SE Basic version 0.80a

Copyright ©1982-87 Amstrad, plc.
```

The RAM in your **ZXCF** or **ZXATASP** interface can be used to store alternative versions of BASIC, or Interface II ROM images. Once they have been added, you can start them up at any time using a simple command.

Adding ROM images to the interface memory

The first stage is to transfer an image of the ROM (BASIC or Interface II) that you wish to use, and save it on the hard disk or CompactFlash card using the **SAVE %** command. You can get these ROMs from various places, but a good starting point is always World Of Spectrum.

Next, you must type the following command, which reserves memory space for the installation process:

CLEAR 29999

Now, install the ROM using the following command:

LOAD %"*filename*" FORMAT *n*

In this command, the parameter "n" is a number made by adding the following values together:

- 0: for an Interface II ROM (or any other ROM that does not require *ResiDOS* support)
- 1: for a BASIC ROM
- 16: to install the ROM into the writeable "RAM" part of the interface memory (the non-writeable "ROM" part is used by default)
- 32: to disable the NMI button for this ROM (only affects BASIC ROMs)

If you don't specify a value, then the default of 0 will be used. Note that it is generally advisable to only store BASIC ROMs only into the non-writeable "ROM" part of the memory, since unless they have been specifically patched they tend to overwrite themselves. However, if you are running short of ROM space on a **ZXATASP** interface, you may specify RAM instead. This is not a concern on **ZXCF** interfaces, since the memory can be configured automatically by *ResiDOS* to be ROM or RAM as required.

A couple of examples are:

```
LOAD %"SEBASIC.FMT" FORMAT 1

LOAD %"c:jetpac.rom" FORMAT 0
```

Managing alternative ROMs

You can see a list of all the installed formats in your interface by using the following commands (the second version includes "hidden" formats, used by the system but not selectable by the user):

```
CAT % FORMAT

CAT % FORMAT EXP
```

The names of the formats (except built-in system formats) will be the same as the filename used when loading them, except that any extension is ignored. For example, the formats loaded in the previous section would be named "SEBASIC" and "jetpac".

You can erase any installed format using the following command (this only erases it from the interface memory, not from the hard disk):

ERASE %"*formatname*" FORMAT

Remember that *SE BASIC* uses **DIR** instead of **CAT**, and **DEL** instead of **ERASE**.

Using alternative ROMs

Once you have installed some formats as described in the previous section, they are available for instant use whenever you switch on the Spectrum. To activate a particular format, use the command:

FORMAT %"*formatname*"

For example, having installed the ROMs in the previous section, we could use either of them like this:

FORMAT %"SEBASIC"

FORMAT %"jetpac"

If the format is an Interface II ROM, it will immediately start. Pressing the reset button will reset the ROM. To return to *ResiDOS* you will need to either reset your interface and the Spectrum together, or switch off the power completely and then switch the system back on.

If you are activating a BASIC format, the Spectrum will restart using that BASIC. You can then use *ResiDOS* commands as normal, and the additional features of the particular BASIC you have chosen.

The new BASIC will remain as the default one even if you switch off the Spectrum and turn back on again. To return to the original BASIC, you can simply select the "Standard" format (which is automatically created as part of the installation process), for example:

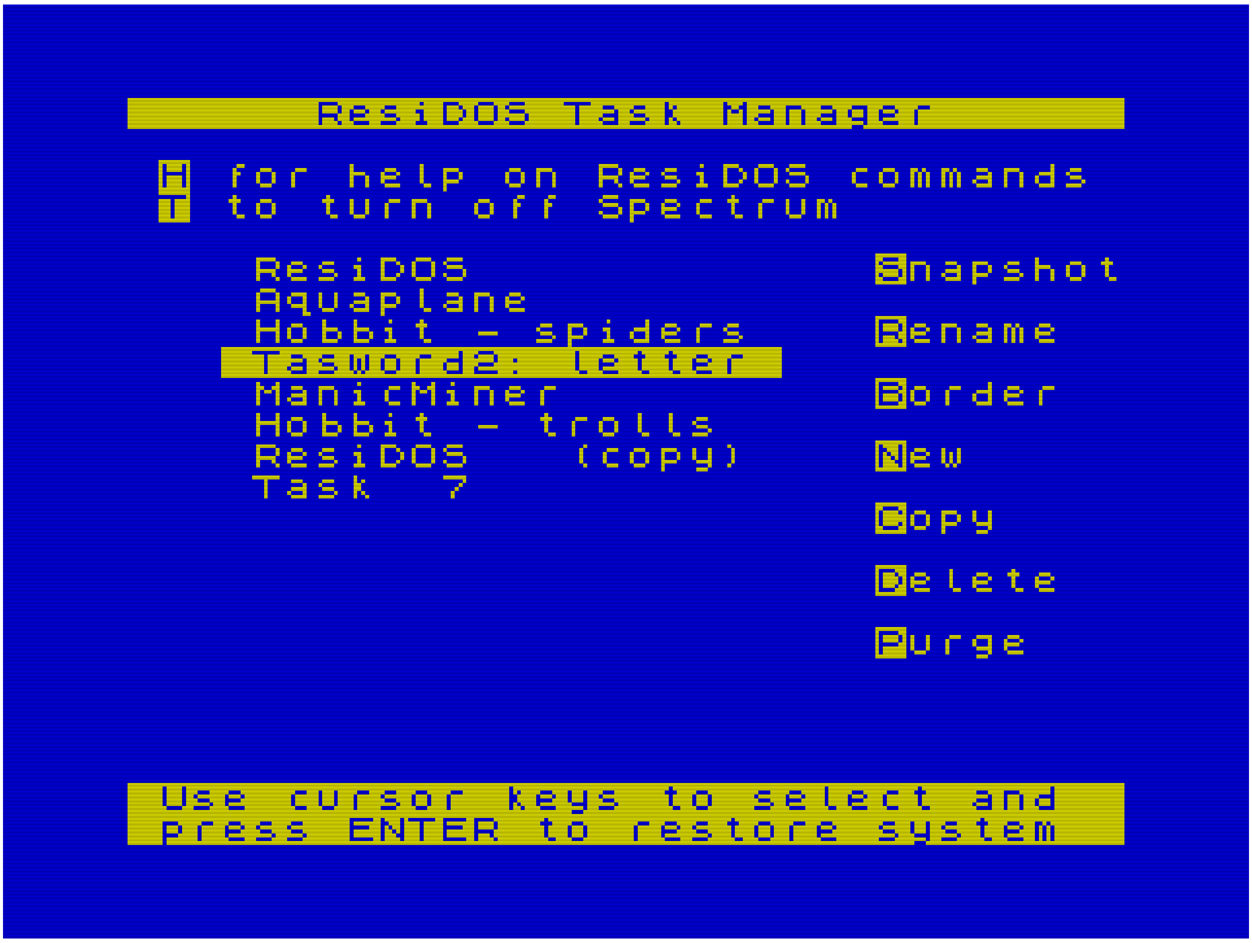
FORMAT %"Standard"

Alternatively, hold down the CAPS SHIFT key while the Speccy is booting up, and the standard format will be automatically re-selected.

One final feature is the ability to switch off the interface memory altogether and use your Spectrum's built-in ROM, without having to unplug the interface or set the upload or disable jumper (this is useful for 128K Spectrums and +3s). To do this, use the command:

FORMAT %""

The ResiDOS Task Manager



```
             ResiDOS Task Manager

 H for help on ResiDOS commands
 T to turn off Spectrum

     ResiDOS                      Snapshot
     Aquaplane
     Hobbit - spiders             Rename
     Tasword2: letter
     ManicMiner                   Border
     Hobbit - trolls
     ResiDOS   (copy)             New
     Task  7
                                  Copy

                                  Delete

                                  Purge



 Use cursor keys to select and
 press ENTER to restore system
```

The Task Manager

When you press the NMI button on your **ZXATASP** or **ZXCF** interface, the Spectrum immediately stops whatever it was doing (whether you were in BASIC, a word processor, a commercial game or whatever) and enters the *Task Manager*.

The *Task Manager* screen shows a list of the current tasks running on your Spectrum, together with the menu options that are available to you. When you first enter the task manager, the task list will consist of just a single task, named "Task 0", which is whatever you were doing at the time. To return to it, simply press ENTER.

Using the RAM in your **ZXCF** or **ZXATASP** interface, you can store several tasks at the same time, and switch between them instantly from the task manager screen. The number of tasks you can have running at once depends on the amount of RAM in your interface. Since **ZXATASP** interfaces have their memory strictly divided between ROM and RAM, they can only run about half the number of tasks as a **ZXCF** interface. With 512K memory, depending upon what else is using your RAM, you can have up to 10 tasks running at once on a **ZXCF** interface, or 5 on a **ZXATASP** interface. The maximum number of tasks allowable is 16 (this is only possible on a 1Mb **ZXCF** interface).

The menu options described below allow you to manage your tasks quickly and easily.

Managing Tasks

The options available are shown on the task manager screen. Simply press the highlighted letter to select the option.

Cursor keys (up and down)

Use these to move the highlight up and down the task list.

ENTER

Re-enters the highlighted task.

New

Creates a new task, activates it and resets the Spectrum into BASIC. (Don't worry, all the other tasks are still there!)

Copy

Makes a copy of the highlighted task.

Delete

Deletes the highlighted task.

Purge

Deletes all tasks *except* the highlighted task.

Rename

Renames the highlighted task. Task names are up to 16 characters long.

Border

Sets the border colour for the highlighted task. Since it isn't possible for *ResiDOS* to know the border colour, it makes a guess which is sometimes wrong. You can change that here before saving a snapshot.

Snapshot

Saves a snapshot of the highlighted task onto the hard disk. This can be reloaded later using the **LOAD %"filename" RESTORE** command.

Other options

Help

Shows a series of pages giving help on extra BASIC commands provided by *ResiDOS*. (NB: This feature is temporarily unavailable, due to a lack of space.)

Turn off Spectrum

This takes you to a special "shutdown" screen, from which you can turn off the Spectrum in safety. When you switch back on, the *Task Manager* will start up again, and you will be able to continue exactly where you were, with all your tasks still running.

ResiDOS Command Reference

The following is a complete list of commands currently provided by *ResiDOS*. "Hard disk" refers to CompactFlash cards for **ZXCF** interfaces, or **ZXATASP** interfaces with a compactflash adapter.

Note that in *SE BASIC* and some others, **CAT** is replaced by **DIR**, and **ERASE** is replaced by **DEL**.

All the **CAT**aloguing commands can send their listings to other streams by specifying a stream number. For example, if stream 3 is attached to your printer, you can use **CAT % #3;"e:*.bas"** to print a list of all the .BAS type files on drive E.

Disk management commands

FORMAT %*unit*, *cyl*, *head*, *sec*

Specifies the parameters (number of cylinders, heads and sectors) of your hard disk. "Unit" is 0 for the master drive, or 1 for the slave drive. Only needs to be done if the auto-detection fails to work.

FORMAT %*unit*, *0*, *0*, *0*

Disables any detection of "unit" altogether. This might help improve boot speed slightly if, for example, you never have a slave drive attached.

FORMAT %*unit*

Changes "unit" to use auto-detection again, rather than manually set parameters.

FORMAT %

Unmaps all current drives and re-initialises IDEDOS (causing disks to be re-detected, and drives mapped back again), without losing any of the program or data currently in memory. This is useful to allow swapping of compactflash cards while the Spectrum is still on.

FORMAT % ERASE *unit*, *maxpartition*

Completely erases the hard disk (unit=0 for master, 1 for slave) and initialises it with the IDEDOS structure. Following this, you will be able to use the partition management commands to add partitions for storing data on the disk. The *maxpartition* number is approximately the total number of partitions you will be able to create; don't make this too large (hundreds of partitions), or other disk management routines will be too slow. Don't make it too small, or you may not be able to create all the partitions you want (some partitions are used to keep track of free space, etc). Suggested values are between 15-63.

Partition management commands

CAT % TAB

Displays a list of all the partitions on your disk, also showing any permanent drive mappings.

CAT % TAB EXP

Displays an expanded listing of all the partitions on your disk, including their physical positions on the disk.

FORMAT % DATA "*name*",*size*

Creates a new data partition on your disk, for storing files. Partition names are not case-sensitive, and can be up to 16 characters long, and include a unit identifier ("0>" or "1>"). The maximum partition size is 16Mb. Sizes can be specified in kilobytes (numbers larger or equal to 256), or megabytes (numbers up to 255).

FORMAT % EXP "*name*",*size*

Creates a new swap partition on your disk, for temporary use by the Spectrum. These are not currently used by *ResiDOS* itself, but may be used by applications in the future. The maximum partition size is 16Mb. Sizes can be specified in kilobytes (numbers larger or equal to 256), or megabytes (numbers up to 255).

FORMAT % BIN "*name*"

Deletes a partition, together with all the files it contains. This can only be done if no drive is currently "mapped" to it.

MOVE % "*unit*>*name*" TO "*newname*"

Renames a partition. The unit identifier *must* be present in the original name in this command.

Drive mapping commands

CAT % ASN

Displays a list of the current drive mappings.

MOVE %"*drive*:" IN "*name*"

Maps a drive ("A:" to "P:") to the partition specified. A maximum of 6 drives can be mapped at any time.

MOVE %"*drive*:" IN "*name*" ASN

Maps a drive, and makes the assignment permanent, so it will automatically be restored each time you switch on.

MOVE %"*drive*:" OUT

Unmaps the drive ("A:" to "P:") specified.

MOVE %"*drive*:" OUT ASN

Unmaps a drive. Additionally, removes any permanent assignment for the drive.

LOAD %"*location*:"

Makes the specified location the default. The location can be a user area (0-15) or a drive (A-P), or both. If you only specify one of these, the current default for the other will be retained. Any filenames that don't include a drive letter or user area will now refer to this default. You can also use the **SAVE** keyword for this command.

LOAD %"*location*:" ASN

Makes the specified location the default, and makes this permanent so that it will also be the default on startup. Otherwise, user area 0 on drive "A:" will be the default drive when you switch on. You can also use the **SAVE** keyword for this command.

File management commands

CAT % Shows a list of all files on the default drive in the default user area.
CAT % EXP Shows an expanded listing of all files on the default drive in the default user area.
CAT %"*filespec*"
Shows a list of files that match the file specification provided. This can include a user area, drive, filename, extension and wildcard characters (* and ?).
CAT %"*filespec*" EXP
Shows an expanded listing of files that match the file specification provided.
LOAD %"*filename*"
Loads a BASIC program from hard disk.
LOAD %"*filename*" CODE
Loads a CODE file from hard disk.
LOAD %"*filename*" CODE *a*
Loads a CODE file from hard disk at a specific address.
LOAD %"*filename*" CODE *a*, *l*
Loads a CODE file from hard disk at a specific address, and with a specific length.
LOAD %"*filename*" SCREEN$
Loads a screen from hard disk.
LOAD %"*filename*" RESTORE
Loads a snapshot from hard disk.
SAVE %"*filename*"
Saves a BASIC program to hard disk.
SAVE %"*filename*" LINE *n*
Saves an auto-starting BASIC program to hard disk.
SAVE %"*filename*" CODE *a*, *l*
Saves a CODE file to hard disk.
SAVE %"*filename*" SCREEN$
Saves a screen to hard disk.
LINE %"*filename*", *line*
Changes the auto-run line number for a BASIC program. If the line provided is 0, auto-running is disabled for the program.
ERASE %"*filespec*"
Erases a file from the hard disk. The filespec can include wildcards to erase multiple files at once.
MOVE %"*filename*" TO "*newname*"
Renames a file (wildcards are not allowed). This command can be used to change the user area a file is located in (but not the drive).
MOVE %"*filespec*" TO "+*attrib*"
Adds the attribute (P=protected, S=system or A=archive) to the file (or group of files) specified.
MOVE %"*filespec*" TO "-*attrib*"
Removes the attribute (P=protected, S=system or A=archive) from the file (or group of files) specified.
SAVE %"*filename*" TO "*filename2*"
Copies a single file to a new file, which may be in the same location, or a different one. You can also use the **LOAD** keyword for this command.
SAVE %"*filespec*" TO "*location*:"
Copies one or more files (if using wildcards) to another location. You can also use the **LOAD** keyword for this command.

Customisation commands

INK % *n*
Sets ink colour to *n* and saves the current colour scheme as the default.

PAPER % *n*
Sets paper colour to *n* and saves the current colour scheme as the default.

BRIGHT % *n*
Sets bright to *n* and saves the current colour scheme as the default.

FLASH % *n*
Sets flash to *n* and saves the current colour scheme as the default.

ATTR % *n*
Sets attributes to *n* and saves them as the default colour scheme.

RUN %"*filename*"
Sets the auto-RUN file, which will only be executed with **RUN %**.

RUN %"*filename*" ASN
Sets the auto-RUN file, which will be executed automatically on boot, or with **RUN %**.

RUN %""
Removes any auto-RUN file setting.

RUN %
Loads and runs the auto-RUN file.

ROM management commands

LOAD %"*filename*" FORMAT
Loads a ROM image from the hard disk and installs to the interface as an Interface II-type ROM. NB: you must first CLEAR 29999 or lower.

LOAD %"*filename*" FORMAT *n*
Loads a ROM image from the hard disk and installs to the interface as a type "n" ROM. NB: you must first CLEAR 29999 or lower. Values for "n" are made as the sum of the following:

- 0: for an Interface II ROM (or any other ROM that does not require *ResiDOS* support)
- 1: for a BASIC ROM
- 16: to install the ROM into the writeable "RAM" part of the interface memory
- 32: to disable the NMI button for this ROM (only affects BASIC ROMs)

CAT % FORMAT
Shows a list of all installed ROM "formats", the location (ROM/RAM) and the type (Interface 2 / BASIC / System).

CAT % FORMAT EXP
Shows a list of all installed ROM "formats", the location (ROM/RAM) and the type (Interface 2 / BASIC / System), including "hidden" formats.

ERASE %"*formatname*" FORMAT
Erases format from ROM or RAM. You *do not* need to change write-protection for this command.

FORMAT %"*formatname*" Restarts computer using selected format.

FORMAT %"" Restarts computer using internal ROM.

ResiDOS Programming

From v1.40, it is possible to access some of the features of the operating system from machine-code programs, so that utility programs which access files can be written.

Calls are available in *ResiDOS* using *hook codes*, which are invoked using the RST 8 instruction followed by a hook code. There are two main hook codes available to programmers: the version information hook code, which detects which version of *ResiDOS* is available (if any), and the package call hook code, which is used to access all other facilities.

All the following pieces of code are provided in the format used by Interlogic's free *z80asm* assembler which is available for many platforms at Z88 Forever!. Binaries are provided for several platforms, and most others (including *MacOS X*) can compile the source package. Additionally, instead of using "magic numbers" for the various call IDs etc, these are defined as meaningful words. You should download the following file, which contains the necessary include files, together with an example utility program (assembly file and pre-built TAP/TZX):

- resitools.zip

Detecting ResiDOS

Any program which is going to use *ResiDOS* facilities must first check that it is installed, and that a suitable version number is available. Currently, you should check that at least v1.40 is available, since no packages or calls were available in previous versions. Some suitable code for testing the version follows. It can be called from BASIC, and returns the version number in BC (or 0 if not installed).

```
.residetect
         ld       hl,(ERR_SP)
         push     hl                          ; save the existing ERR_SP
         ld       hl,detect_error
         push     hl                          ; stack error-handler return address
         ld       hl,0
         add      hl,sp
         ld       (ERR_SP),hl                 ; set the error-handler SP
         rst      RST_HOOK          ; invoke the version info hook code
         defb     HOOK_VERSION
         pop      hl                          ; ResiDOS doesn't return, so if we get
         jr       noresidos         ; here, some other hardware is present
.detect_error
         pop      hl
         ld       (ERR_SP),hl                 ; restore the old ERR_SP
         ld       a,(ERR_NR)
         inc      a                           ; is the error code now "OK"?
         jr       nz,noresidos                ; if not, ResiDOS was not detected
         ex       de,hl                       ; get HL=ResiDOS version
         push     hl                          ; save the version
         ld       de,$0140          ; DE=minimum version to run with
         and      a
         sbc      hl,de
         pop      bc                          ; restore the version to BC
         ret      nc                          ; and return with it if at least v1.40
.noresidos
         ld       bc,0                        ; no ResiDOS
         ld       a,$ff
         ld       (ERR_NR),a                  ; clear error
         ret
```

Package calls

The facilities of *ResiDOS* are divided up into *packages*, each of which provides its own set of calls. Two packages are currently provided: the *ResiDOS* package itself, and the *IDEDOS* package. The first of these provides only one call at the moment (to cause a new *ResiDOS* error code in BASIC); the other provides all the useful calls for accessing partitions and files.

Making a package call involves the following steps:

- setting up registers required by the call
- switching to the alternate set, and loading B with the package ID and HL with the call ID
- invoking the package call hook code
- checking for errors if the carry flag is reset (Fc=0)
- examining the registers returned by the call

Here is some generic code to make a package call. Note that if you are intending to return to BASIC at any point, you should always preserve the alternate HL register pair (H'L') as this is required by BASIC:

```
; set up any entry parameters here
exx
ld        b,package_id
ld        hl,call_id
rst       RST_HOOK           ; invoke the package call hook code
defb      HOOK_PACKAGE
jr        nc,process_error   ; handle error if Fc=0
; handle any return values here
```

The ResiDOS Package

This package currently provides a single call, which takes a *ResiDOS* error code in A (such as returned by any call in the IDEDOS package) and generates a report message, returning to BASIC. Here is an example use of this call:

```
ld        a,rc_noswap                 ; "no swap partition"
exx                                   ; switch to alternate set
ld        b,PKG_RESIDOS               ; ResiDOS package
ld        hl,RESI_REPORT              ; ResiDOS call ID
rst       RST_HOOK           ; invoke the package call hook code
defb      HOOK_PACKAGE
```

The IDEDOS Package

This package provides many of the calls available in +3DOS (used on the +3 and +3e) and IDEDOS (used on the +3e). The calls all use the same input and output parameters, but there are some "gotchas":

- 128K memory configurations are not supported. You should always specify 0 for the page number in calls which expect it.
- Some calls return addresses "in page 7" (such as DOS_REF_HEAD). Data at these addresses cannot be accessed directly, since it is not in main memory. Instead, you must use the IDE_ACCESS_DATA call, detailed later.

+3DOS Calls

The following +3DOS calls may be used. Full details are in the +3 manual, which can be obtained from The World Of Spectrum. Calls marked with an asterisk probably won't work as expected, or be very useful.

- DOS_INITIALISE
- DOS_VERSION
- DOS_OPEN
- DOS_CLOSE
- DOS_ABANDON
- DOS_REF_HEAD
- DOS_READ
- DOS_WRITE
- DOS_BYTE_READ
- DOS_BYTE_WRITE
- DOS_CATALOG
- DOS_FREE_SPACE
- DOS_DELETE
- DOS_RENAME
- DOS_BOOT *
- DOS_SET_DRIVE
- DOS_SET_USER
- DOS_GET_POSITION
- DOS_SET_POSITION
- DOS_GET_EOF
- DOS_GET_1346 *
- DOS_SET_1346 *
- DOS_FLUSH
- DOS_SET_ACCESS
- DOS_SET_ATTRIBUTES
- DOS_OPEN_DRIVE
- DOS_SET_MESSAGE
- DOS_REF_XDPB
- DOS_MAP_B *
- DD_SET_RETRY
- DD_SEL_FORMAT *
- DD_ENCODE
- DD_L_XDPB *
- DD_L_DPB *

IDEDOS Calls

The following IDEDOS calls are provided. Documentation is provided at the +3e website.

- IDE_VERSION
- IDE_INTERFACE
- IDE_INIT
- IDE_DRIVE
- IDE_SECTOR_READ
- IDE_SECTOR_WRITE
- IDE_FORMAT
- IDE_PARTITION_FIND
- IDE_PARTITION_NEW
- IDE_PARTITION_INIT
- IDE_PARTITION_ERASE
- IDE_PARTITION_RENAME
- IDE_PARTITION_READ
- IDE_PARTITION_WRITE
- IDE_PARTITION_WINFO
- IDE_PARTITION_OPEN
- IDE_PARTITION_CLOSE
- IDE_PARTITION_GETINFO
- IDE_PARTITION_SETINFO
- IDE_SWAP_OPEN
- IDE_SWAP_CLOSE
- IDE_SWAP_OUT
- IDE_SWAP_IN
- IDE_SWAP_EX
- IDE_SWAP_POS
- IDE_SWAP_MOVE
- IDE_SWAP_RESIZE
- IDE_DOS_MAP
- IDE_DOS_UNMAP
- IDE_DOS_MAPPING
- IDE_DOS_UNPERMANENT

One slight difference is that for the IDE_DOS_MAP and IDE_DOS_UNMAP calls, the FLAGS3 variable is not used (it doesn't exist on all Spectrums). Instead, you can provide a drive letter as lower-case to make the mapping permanent.

Additional calls

An extra call, IDE_ACCESS_DATA, is provided so that data which exists in the *ResiDOS* memory can be read or written by programs. Such addresses are referred to in the +3DOS documentation as being "in page 7". Instead, use this call, with the provided address as the source or destination, and your own buffer as the other address:

```
; IDE_ACCESS_DATA
;       IN:     HL=source
;                   DE=destination
;                   BC=length
;       OUT(s): Fc=1
;
; Register status on return:
; ......../IX same
; AFBCDEHL/.. different
```

From IDEDOS v1.02 onwards (available in ResiDOS v1.60+), the following additional calls are available:

IDE_PARTITIONS returns the number of open partitions (excluding the system partition, which is always open) on the unit specified:

```
; IDE_PARTITIONS
;        IN:       A=unit (0 or 1)
;        OUT(s):   A=number of open partitions, excluding system
;                  HL=free partition handle, or 0
;                  Fc=1
;
; Register status on return:
; ......../.. same
; AFBCDEHL/IX different
```

IDE_IDENTIFY reads the 512-byte drive identity information, which can be examined to determine the drive type and manufacturer, as well as other information:

```
; IDE_IDENTIFY
; Low-level IDE 512-byte "drive identity" read
;        IN:       B=page for transfer
;                  C=unit (0 or 1)
;                  HL=address
;        OUT(s):   Fc=1
;                  HL=end address+1 (in segment 3)
;        OUT(f):   Fc=0
;                  A=RC_READY, drive not ready
;                  A=RC_SEEK, seek fail
;                  A=RC_UNKNOWN, unknown disk error
;
; Register status on return:
; ..BCDE../IX same
; AF....HL/.. different
```