

QSpread 2003

Spreadsheet program

for the Pointer Environment
under QDOS and SMSQ

7th Edition

Software and Documentation by

Oliver Fink
Jochen Merz
Bernd Reinhardt

©1992 - 2005 Jochen Merz Software

Contents

1. Introduction	4
1.1 A history lesson	4
1.2 The background	5
1.3 The idea	6
1.4 Preface to the current version	6
2. Basics	7
2.1 What is a spreadsheet program?	7
2.2 Installation	8
2.2.1 What the files do	8
2.2.2 Making a working copy	9
2.2.3 Harddisk installation	10
2.3 Starting Qspread	10
3. The program	11
3.1 The Main window	11
3.1.1 Toolbar	12
3.1.2 Item explanation	13
3.2 Window related commands	13
3.3 Commands	14
3.4 The grid	15
3.4.1 Sections in the grid	16
3.4.2 Shortcut keystrokes	17
3.4.3 Other special keystrokes	18
3.5 The current cell (and current range)	18
4. Formulae and Data	19
4.1 Entering numbers	19
4.1.1 Entering lists of data	19
4.1.2 Multiple cell entry	20
4.2 Entering formulae	20
4.2.1 Percentage	21
4.2.2 Variables	21
4.2.3 Relative and absolute variables	22
4.3 Entering text	22
4.3.1 Special treatment of text	22
4.3.2 Simple text entry	22
4.3.3 Text functions	23
4.4 Special keys during entry	23
4.5 User defined functions	23
4.5.1 The date-function	24
4.5.2 The sum-function	24
4.5.3 The line-function	24
4.5.4 Special treatment in user defined functions	24

5. Value representation	25
5.1 Formatting numbers	25
5.1.1 Justification	25
5.1.2 Units	25
5.1.3 Monetary symbol	25
5.2 Rounding numbers	25
7. Driver and Filter	26
7.1 Printer driver	26
7.2 Import filter	27
7.2.1 Data - Numeric data import	27
7.2.2 NewSize - load a table into a different sheet	27
7.2.3 Merge - merge existing file into current sheet	27
7.2.4 PsionImport - load prepared Psion Export files	27
7.3 Export filter	28
8. Examples	29
8.1 The example table	29
8.2 The multiplication table	31
9. Command reference	33
9.1 Help (F1)	33
9.2 File (F2)	33
9.3 Grid (F3)	35
9.4 Cell (F4)	36
9.5 Status (F5)	37
10. Configuration	39
11. Command line switches	39
Appendix A - Formula parser functions	40
A.1 Numeric functions	40
A.2 Numeric constants	42
A.3 Text functions	42
A.4 Numeric operators	43
A.5 Comparisons	43
Appendix B - Technical background	44
B.1 Memory	44
Appendix C - File format	45
Appendix D - Writing im- and export filter programs	47
QSpread 2001 Additions	48

1. Introduction

I know for myself that manuals are usually hard to read and understand, and are furthermore quite boring. Having bought a new program you certainly want to see it running on your system, you want to get grips to it.

If you can not tempt your impatience any longer, you can flip directly to chapter 2. Later, if you have some spare time, sitting with a good cup of coffee in your comfortable armchair, not knowing for sure what to do next to spend that boring sunday evening, please remember to read this introduction.

Note: this is the second edition of the manual, which became necessary because most readers felt a bit lost in the old edition, as I took several topics for granted that were obvious to me. But please understand that I cannot start from scratch again, explaining how to use QDOS and the Pointer Environment; there are enough manuals for these topics available already.

1.1 A history lesson

About fifteen years ago, the QL running under QDOS saw the light of day. Historically speaking, the (computer) world was quite young and had just recently left the stone age of CP/M and started to relate to new technological steps.

This new technology was called DOS, and only the privileged ones could call a PC with DOS their own. New and for the future, as it expanded the only a few years ago as unreachable declared memory limit of 64KBytes to gigantic 640KBytes.

In another room, some highly paid developers of a business firm named after a delicious fruit, banged their heads together to get a graphical user interface, that could really bring the real world into the computer, ... or was meant to do something quite like that.

About that time, a company known to bring revolving technologies on the market, released its new kid. After a rather bad start on the search for a new operating system (a task where a well known developer failed), QDOS was developed in a hurry under their own flag and fitted into the QL. Even at that time, QDOS had an unexpected and unfortunately often ignored feature, called multitasking.

Whoever worked with the QL at that time didn't get much of it to see, though, because most software developers weren't able to exploit that technology. But in spite of the commercial bad luck ending in the takeover by Amstrad, not all users changed to other systems. QDOS would have died, if there hadn't been Tony Tebby, the writer of QDOS, who put all his effort into his child, giving it functions now well known as Pointer Environment, Hotkey System or Thing System. All these new features are today well ahead of their time.

Just recently, the fruit company started, admittedly without much success, to bring multitasking into their system. And DOS is completely incapable and has

to be replaced by OS/2.

1.2 The background

You are probably asking yourself, "what has all this to do in a spreadsheet manual?"

Well, at that time there existed the four standard applications for the QL, which every QL buyer got for free, and which had a fairly high quality, as they came from the Psion software house well known to Sinclair users. They used their experience from other computers very well on QDOS, but unfortunately without paying attention to the facilities offered by the QL.

After the takeover of Sinclair, Psion also cut off the support for their programs, as the QLs share of the computer market was officially declared dead. The only major change, that entered the QL market rather unofficially, was the integrated package XChange, bundled with a pseudo multitasking system.

A lot has changed now, not only for QDOS users, but the whole computer market has shifted too. Since the introduction of QJumps Pointer Environment (which was intensively tested to run all Psion applications) the QDOS world never looked the same.

The front end has become user friendly, and most operations can be invoked by a click of the mouse. Multitasking with less than twenty programs become more seldom. But at least since the appearance of new hardware like the Extended4-emulator for the ATARI or the Winchester drivers, most users wish to see programs running that they need to use. But no help can be expected from Psion.

An additional problem is that there are no real applications available actually using the Pointer Environment. Of what use is a good operating system, if there aren't any programs around to work with. Is QDOS really finally destined to die, just because there are no applications coming..?

1.3 The idea

The idea was to write modern, user-friendly programs based on graphic user interface. I think, everyone knowing the QL scene will understand, that the expenditure of writing professional applications is in no way related to the commercial success.

I think it can not be expected from one single programmer, to perform the actions the way big software companies achieve by paying teams of writers lots of money. Therefore another way has to be taken.

QSpread is a new approach in software development, the attempt to finally get to a program, that fits to your wishes. It is planned as a development in stages, and it took me about half a year of constant daily development work to get to the current result, version 1.xx. In principle, it is no problem to clutter a program with lots of useless features, but it is always a question of time and usage. I think it is more sensible to have a program that provides the facilities the user (i.e. you) really needs. Therefore you are welcome to make suggestions to the program, because it is a program that you want to work with.

This is a chance, that can only be offered in small marked like the QDOS one. It is impossible to get a new enhanced version of ABACUS, and it is very very unlikely to see the implementation of a special function into an hundreds of pounds expensive program like EXCEL on so called professional computers. But QSpread will be developed further and changed to your needs.

1.4 Preface to the current version

This is the second major release of QSpread. It contains all important facilities to enter, change and print data. Some functions are not in the performance one can imagine, but optimising takes a lot of time, too.

It became evident that the Window Manager routines are limited to a maximum of 32K (32768) of objects, i.e. cells. This means, that QSpread won't be able to provide sheets with more than that number of cells.

2. Basics

2.1 What is a spreadsheet program?

First of all, I think I should explain some of the terms and concepts, that are commonly used when working with spreadsheet programs. If you don't understand some terms first time, it can make sense to play around with the program for a while and to read this section again.

A spreadsheet program can be imagined as a crossing between a typewriter and a calculation,... well, not quite, but comes quite near to the real thing. Or better imagine it as a calculator with a gigantic memory space, that can store numbers, formulae or even lines of text. Because of this, it is ideal for preparing tables and columns of data.

This gigantic memory can be thought of as sheet of paper, with boxes for each entry. These boxes are called cells (since they are the smallest entities which can't be split any more). Each cell is completely independent and has the ability to remember and show exactly one thing, either a number, or a formula or a bit of text.

But the single cells can not just float around in space as they like, there has to be an order to make it possible to identify a special cell. Though they are arranged in "rows" and "columns", which all together make up the sheet. To identify the one cell you are looking for, it needs to get a simple and easy to remember name, which has to be unambiguous since in a tiny sheet of 20 columns by 20 rows you will already find some 400 cells.

The rows are numbered in the usual way, starting from one. The columns are a bit more complicated, as they are numbered alphabetically, meaning from A to Z. Wait a minute, you say, does that mean I can only use 26 columns at a time? As this is obviously not desirable, and as it is not quite easy to invent some more characters, the following 27th column is numbered as AA, followed by AB, AC, etc. and the next column after AZ is, yes... congratulations.. BA!

Since each cell is always found at the fixed position, where one column and one row fall together, its name (professional users are speaking of reference) is derived by combining the column and the row name, say D for the column and 3 for the row, for example, will result in D3 for the name of the cell. Please note that there is no difference if you use upper or lower case for the column name. QSpread itself uses the upper case characters, as I think they are more readable (you might have a different opinion on this, but I am not going to change anything on this respect, am I?) But please remember that no other characters (or spaces!) are allowed between the column and the row name, so B 3 is WRONG!

To solve more complicated tasks, which probably will require more than one cell, it is possible to collect a set of cells in a "range" or block. The only requirement for this block is, that is a rectangle. This sort of block is described by its top left as well as its bottom right hand cell, both names separated by a colon (:). The range of B3:D6 represents a block of three cell width and four cells height, a collection of 3*4=12 cells. The form of a block can not be changed, meaning it is not possible to copy for example this block into a block 1*12=12 cells.

In QSpread, there is always a current cell (working cell) or a current range, respectively. This current range is highlighted, as most operations are dealing with that part of the sheet only.

2.2 Installation

2.2.1 What the files do?

First of all, you are hereby advised to produce a backup copy of your QSpread Master Disk. Everybody has his own ideas of how to do this, I prefer QPac2, which seems most stylish! But commands work as well (please don't blame me if I am only explain this procedure with Toolkit II commands, as file handling on a "dumb" QL is a nightmare... whoever hasn't got it yet.. get it!)

In the event that you are not (yet?) the proud owner of a harddisk system, you can use your working to work with it (yes!). Harddisk owners probably like to install QSpread there, but it isn't also a bad idea to make a backup first.

On the Master Disk are the following files:

BOOT a short SuperBASIC start program, that loads all system extensions required as starts the (german) program.

The following files are resident system extension required for the use of QSpread (in one language only, of course!). They are installed in the given order using the LRESPR command. SMSQ/E needs the Menu Extension only!

PTR_GEN the Pointer Interface
WMAN the Window Manager
HOT_rext_english the english Hotkey System II
MENU_rext_english the english Menu Extensions

The QSpread program itself is a simple executable file. You may need the help text and some examples:

QSpread_english the english
QSpread_Help_xxx the english help files
Example_xxx_tab some example files

QSpread uses for im- and export, as well as for printing, external filter programs, which allow easy modification and update without changing the whole program.

Printer filters:

driver_EPSON_bas	for Epson compatible printers (SMSQ)
driver_EPSON_obj	for Epson compatible printers (non-SMSQ)

Import filters:

Filter_PsionImport	Abacus filter for (prepared) import
Filter_Data	for numeric data lists
Filter_Merge	for importing existing sheets
Filter_NewSize	for tables of different sheet sizes

MenuConfig_english The English pointer based configuration program

2.2.2 Making a working copy

In case you have two disk stations, it is quite easy. Insert your Master Disk into drive flp1_ and a formatted(!) and empty(!) disk into drive flp2_:

WCOPY flp1_,flp2_	copy files from flp1_ to flp2_
.... Y/N/A/Q? A	all files available

If you have only one drive, it is a bit more complicated. The files are temporarily held on the memory drive (RAM-Disk, available in most floppy controller software!). First insert the Master Disk into your Drive (flp1_)

WCOPY flp1_,ram1_	copy all files from flp1_ to ram1_
.... Y/N/A/Q? A	all files available

(now insert a formatted(!) and empty(!) disk into the drive)

WCOPY ram1_,flp1_	copy all files from ram1_ to flp1_
.... Y/N/A/Q? A	all files available

You should now keep your QSpread Master Disk in a save place, because updates of QSpread are only valid with this disk. So keep it save!

2.2.3 Harddisk installation

Every harddisk owner has his own theory of how to order and arrange the medium the best and most efficient way. I prefer a sub-directory for the QSpread files, one for the filters, and one for the Help files.

MAKE_DIR win1_QSpread_	sub-dir for QSpread
(MAKE_DIR win1_QSpread_Filter_	sub-dir for the filter, if you like)
(MAKE_DIR win1_QSpread_Filter_	sub-dir for help-files, if you like)

Now copy the program and help files as well as the required filters into these directories, as well as the example files, if you like.

I assume that you already a place where you hold your system extensions. Please actualise the respective files there, and alter your BOOT file according.

From now on, if I you the term xxxx_ in a drive specification, that means win1_QSpread_ for you. Please use a configuration program to change the name of the filenames in QSpread for help file or filters.

2.3 How to start QSpread

Now it becomes quite interesting. First of all, you should reset you computer to make sure all system extensions required are present.

Now simply start the program from wherever you placed it, using the QPac2 Files Execute menu, or from SuperBASIC with the command:

EX xxxx_QSpread	where xxxx is the name of your drive, eg. flp1_ for floppy, or win1_QSpread_ for harddisk
-----------------	---

To play around the controls of QSpread, to get a feel for the program, and to follow some examples, now start QSpread with as follows:

```
EX xxxx_QSpread;'f xxxx_example_tab'
```

This command starts QSpread and loads an example file.

We also recommend that you read the file readme_txt on the master disk, as it may contain useful update-information not reflected in this manual. If the file does not exist, then there are probably no updates.

3. The program

3.1 The main window

After QSpread has started, you will see the main window. If you had any experience with standard pointer programs, like QPac2 or QD, before, you will find yourself in an environment you are used to, and probably like to skip the rest of this section.

On execution, the QSpread main window is drawn with the maximum screen size available (unless you configured it to behave otherwise). You will identify four main areas with different function.

First and most obvious is the grid, the area where a part of the sheet will be shown. Surrounding this window are the names of the columns or rows, which help to identify the cells.

Above its top edge is the entry line, which looks rather unsuspecting right now (it is where TAB is given as keyboard selection). This is where later all important data is presented and entered into a cell. It is possible to enter formulae which are longer than the visible line. Press SHIFT TAB and a window pops up which allows you to enter much longer lines. If you DO on the formula which is shown next to TAB then you get this window too.

Above the entry line is the Toolbar, a representation of some of the most often used command in cartoon-like pictures (called "icons") for quick access (see below).

Then there is a list of commands (F1-F10), and a small, curious looking little command item, that will all be explained later.

And at last, in the top row of the window, the program name (now this is really important... isn't it?), the name of the current file that you know what you are working on, and the window related commands, with which I start to explain.

3.1.1 The Toolbar

The symbols in the toolbar will activate the following actions (from left to right):

- Help (question mark symbol). HIT calls the help texts, DO shows information about QSpread.
- Load (disk with arrow). HIT loads a sheet, DO imports.
- Save (arrow pointing to disk). HIT saves current sheet, DO allows specification of a new filename.
- Print (printer). HIT prints a page starting from current cell.
- Search (magnifying glass). HIT pops up the search menu.
- Repeat last search (magnifying glass with dots).
- Echo cell over range.
- Copy range.
- Move range.
- Delete range (cell with trashbin).
- Protect or unprotect range (cell with padlock). HIT protects, DO unprotects the selected range.
- Overwrite scrap with current range (arrow pointing to clipboard symbol).
- Number representation (digits).
- Currency symbol.
- Left-justify cell or range.
- Right-justify cell or range.
- Column width. HIT will pop up the column width menu, DO will set the perfect column width over the selected range.

To the very right, you will find a calculator symbol which will recalculate the grid.

All functions are available via menus as well, and more details on the various functions can be found there.

3.1.2 Item Explanation

You can get explanatory help about menu items in the main menu (including the icons). Move the pointer over the desired item and wait a few seconds. A small text will pop up, explaining the function of this item. If it has two different functions for the two different mouse buttons, it will explain both functions (left button first, then right button). Of course, [SPACE] is the same as the left mouse button, [ENTER] or [RETURN] the same as the right mouse button.

The small window disappears as soon as you move the mouse or press any key.

You can disable this feature by typing the following line into BASIC before you start QSpread:

```
SET_DEFAULT 97, "-1"
```

Any other value instead of "-1" sets the delay. "50" is one second. Please note that the quotes are mandatory!

You can also configure MENU_REXT to make the change permanent. Use the program Menuconfig (see further on in the manual) but configure MENU_REXT instead of QSpread!

3.2 Window related commands

Now, there are three standard window command, that are present in most pointer based programs (or, at least, should be). The commands are represented in visual form, ie. little pictures or icons.

In the top left hand edge of the window is an icon of two overlapping squares. This is the window move command, that allows you to move the window, as it is, to a different screen position. When you HIT this picture (ie. press the left mouse button, or the SPACE key), the pointer will take its form, and you can now move this symbol around. If you HIT a second time, the window is moved to this position (if there is enough screen space left to move it actually there).

As you probably noticed, there is no point in moving a window that actually has the maximum screen size (yes.. you won't notice any great difference).

The second window related command, that is situated right of the move command icon and looks like two joined squares, is the window resize command. If you move the resize pointer (after an initial HIT) away from the window (ie. to the left and/or up) the window will be enlarged; if you move the pointer towards the window (ie. right and/or down) the window will shrink. Needless to say that there is no way of making a window bigger than the actual screen size, and only that small that all other windows fit inside. Please note: to bring the window into its full-sized state, simply perform a DO (right mouse button, or ENTER) on the resize item.

The last window command looks like a visualised sort of comic-like sleep, and that is exactly what it does: it put's the program to sleep. Now what the hell does that mean, again? Well, it temporarily removes the window from the screen, replacing it by a small button, which will hurt nobody (in case you have QPac2, the button is put into the frame). If you decide you like to continue working with the program, just DO the button, and there is your window again, as you left it.

There one item which is not actually a window related item, but it is one of the items of the standard suite now. The About .. item provides a nice way to check your version number of the application.

3.3 Commands

This is just a short overview of the commands, which are quite complex. To keep track of the commands, they are help in menus according to their function. More detailed information for each command can be found in the reference part of this manual.

The Help command (F1) provides you with instant information. You are presented with another menu, which allows you to choose the one topic of interest for you. Of course, the help files have to be installed on your system.

The File command (F2) collects all commands that are related to file or printer operations. This is where you can create a new sheet as well as change parameters for the printer.

The Grid command (F3) contains all commands, that affect the sheet as a whole. This is where you also find the Quit command, to finally leave the program.

The Cell command (F4) is responsible for all commands dealing with the changing of the current cell or current range.

The Status command (F5) allows to fine-tune the QSpread working environment, which will obviously affect most other operations.

The Functions or Fn's menu (F6) contains a list short list of formulae often needed. It's a sort of a scrap for these in case you are quite as lazy as I am, and reluctant to entering the same thing over and over again.

The All command (F8) is a special short command, that determines if just one cell or all cells in a selected range are affected by an entry.

The Again command (F9) repeats the last search as determined in the find function of the Grid Menu.

On the right and side of this line is the Goto command (F10). It will normally show the name of the current range. Furthermore this is where, during time consuming tasks, the cell where QSpread is currently working on, will be shown, to keep you informed. When you execute this command item, you can either enter the name of the cell you want to see next in the top left corner of the grid, or press just enter to see the current cell, or press the cursor-up or cursor-down key to move to the first or the last cell in used the grid. This allows you to move quite fast over the whole sheet.

Below this, you will see three small icons. The leftmost will insert the current date into a cell which you may select - details how this works will be given later.

There is another curious looking command (scientists will certain recognise it as the symbol for the sum). It is a single function (ie. no menu), that contains the sum-formula, which will be explained later on.

Furthermore there is the line-function (right to the sum-function, and can be activated by the underscore keypress), which brings a dividing line of the length of the current block into a cell... but as I said, more of this in later section.

3.4 Grid

The most space in the main window is taken up by the grid. It always shows a part of the whole sheet (unless the sheet is as tiny to fit completely into the grid).

On the edges on the grid window, you will find small arrows in all directions. The arrows enable you to move the a previously hidden part of the sheet. That part of the sheet will be shown, that can be found in the direction of the arrows. When you HIT a line of arrows, the following row or column will be displayed, whereas when you DO the arrow line, a new page of columns or rows is shown, which is a lot faster.

The numbers of the lines currently shown in the grid can be found on the left hand side outside the grid, the names of the columns are shown on top of it. From this information it is possible to derive the name of a cell just shown. This information if updated, of course, when you move the grid around on the sheet, so that you can really rely on this.

Below and on the right edge of the window you will see a horizontal as well as vertical bar, where each contains another bar inside. These are the "thermometer bars" (called so after their breathtaking look-alikes), which serve as indicators (not unlike a map) of where compared to the whole sheets the grid can be found (and how large if approximately is).

The thermometers have, in addition to their informational value, a nicely practical use, that allows you to zip through the grid as you like. If you want to, for example, go directly to the bottom of the sheet (and you have no idea what number the last line has) you HIT the right hand bar in its bottom part. I think this is the fastest way to get anywhere, if you have a slight idea where that might be. You can also hold the HIT-button pressed when you move up and down, and the bar will follow your moves.

3.4.1 Sections in the grid

But that's not all you can do with the thermometer bars! But I have to warn all beginners, that it might become quite confusing right now, but as time comes, you will also like this function, I am sure.

The grid can be split, horizontally as well as vertically, into independent sections. This makes it possible to look and work at different parts of the sheet at the same time. QSpread supports up to nine sections (three horizontal and three vertical sections). But that looks quite confusing, indeed.

To split the grid window at a selected position, ie. creating a new window that can be controlled in the same way the old window, you move the pointer to the position in the bar, where the split in the window has to be carried out, and press the DO button. Now the split should be shown, as well as a new pair of arrows in the window at the splitting position.

To join two windows back to one, it is in fact the same procedure. Move to the position of the split in the bar, and make a DO.

There are some functions that automatically rejoin the splits and restore the normal grid window. These are the window resize and sleeping functions, most of the file commands as well as changing column sizes.

3.4.2 Shortcut keystrokes

In some pulldown-menus you will find red characters (e.g. ^L) after the menu entry. This means, that you can select this item by pressing CTRL L in the main menu without going through the F2/F3/F4/F5 sub-menu. This is called a shortcut keystroke. Shortcuts are possible when the pointer is inside the grid. Here is a complete list of all short selection keystrokes available in QSpread:

CTRL A	is the same as HIT (same as left mouse button) - will move the current cell to the pointer position.
CTRL B	is the same as DO (same as right mouse button) - marks a range.
CTRL C	switch to next job (QDOS function).
CTRL D	gives Help (same as F1).
CTRL E	Window Move (same as CTRL F4).
CTRL F	Window Resize (same as CTRL F3).
CTRL G	puts QSpread to sleep (same as CTRL F1).
CTRL I	same as pressing the TAB key.
CTRL J	same as pressing RETURN or ENTER (but NOT the same as DO).
CTRL K	turns pointer into Insert Column mode (found in F3).
CTRL L	brings up Load sheet (found in F2).
CTRL N	brings up Save with new Filename (found in F2).
CTRL O	turns pointer into Delete Row mode (found in F3).
CTRL P	brings up Print menu (found in F2).
CTRL R	recalculates the grid.
CTRL S	brings up the Search menu (found in F3).
CTRL T	brings up the Justification menu (found in F4).
CTRL U	activates the Move Range cursor (found in F4).
CTRL V	saves the current sheet (found in F2).
CTRL W	turns pointer into Insert Row mode (found in F3).
CTRL X	quits QSpread (found in F3).
CTRL Y	activates the Copy Range cursor (found in F4).
CTRL Z	activates the Echo Cell cursor (found in F4).

3.4.3 Other special keystrokes

We have introduced some special keystrokes for owners without a mouse. You can simulate the mouse keypresses by pressing SPACE for a HIT and RETURN or ENTER for a DO, if you are outside the grid. Inside the grid, you can use CTRL A and CTRL B to simulate the mouse buttons.

You will find that it is impossible to leave the grid with the cursor keys once you are inside. At least it is quite fiddly. Here are some useful keystrokes:

TAB selects the normal entry line.

SHIFT TAB brings up the long entry window.

ALT TAB brings you into the toolbar area.

CTRL F10 brings you next to the scroll and pan bars when you are inside the grid, otherwise moves the pointer back into the grid.

ESC puts QSpread to sleep.

3.5 The current cell (and current range)

As I said before, the highlighted cells are treated specially in QSpread. The highlighting will help you to identify the cells in the sheet, where action takes place, although these cells need not to be visible in the part of the sheets shown in the grid. Additionally, the current cell or range is shown as a name in the Goto command item. Note: to display the current cell in the grid, just hit the F10 item once, and press ENTER again.

To make any other cell in the grid the current cell, move your pointer to this cell and make a HIT. Now this cell is highlighted and its name is shown in... yes, you're right, in the Goto command.

Pressing ENTER without entering anything will move to the next cell.

It is possible to specify whether QSpread should move to the next cell to the right or below after any input, or whether it should remain over the current cell. You can set this in the F5 - Status menu or configure it permanently using the configuration program.

But there is also the current range, which is, as I said, the collection of a number of cells that are to be changed together. This collection has to be a block. To mark this block, you first select the top left hand cell with a HIT and make it to the current cell.

Now move the pointer to the cell, that it at the bottom right hand corner of your block and DO it. The whole block is now selected and the range shown in the Goto command.

4. Formulae and Data

Now that you are used to the basics of controlling the window, let's dig a bit deeper into the spreadsheet stuff. This sections covers the way of entering information into cells.

Well, one cell can contain exactly one item of information. This item can either be

- a number
- a line of text
- a formula
- or a user defined function

Please don't take this to seriously, as there is, in the mathematical sense, no difference between numbers or formulae, although QSpread offers different ways of entry, that are in fact interchangeable.

Don't get confused now, just put the pointer into the grid window and type in as you like. QSpread is intelligent and tries to interpret your entry right.

4.1 Entering numbers

Let's start with the easy task of entering a number into a cell, say for example, 42. First of all, select an empty cell as the current cell. As you certainly remember, entries are made in the entry line, on top of the grid. All numbers can be entered directly when the pointer is in the grid window, ie. without selecting the entry line explicitly.

That means for you that you just have to press the digits 4 followed by 2. When first digit is entered, QSpread recognises that you wish to enter a number and activates the entry line itself. To confirm the entry, press ENTER. Now you will see that the number 42.00 is in the current cell. (If someone is interested: the fractional part of the number is just a display format that can be changed. Details follow.)

4.1.1 Entering lists of data

As it is a usual procedure to enter columns of data into some following cells, there is an easy way in QSpread to enter lists of data (numbers, text or formulae) without having to select each cell on its own.

First select the block, as described above, as the current block. After the first number is entered, QSpread prepares the next cell and requests entry in the entry line. In case you made up your mind not to enter any more data, just press the ESCape key. (Interested readers will think about which the next cell in the block actually is? Well, in QSpread there is an entry order that can be changed in the Status menu, that determines that either the rows or the columns in the block have to be filled first, before the next is taken.)

4.1.2 Multiple cell entry

Sometimes it is quite useful to enter the same data (numbers, text or formulae) in more cells (ie. in a block). That's what the All command (F8) is for. When it is active, the one data entered will be used for all cells in the current block. This is interesting when making use of special functions like col() or row(), that result in different values according where they are used in the grid.

Note: Please don't forget to deactivate the All command when you don't need it any more.

4.2 Entering formulae

You can not only enter number starting with digits directly, but formulae and text alike, where QSpread was made intelligent in the way that it recognises automatically, whether the entry is a number, a formula or text, you don't even need to start text with an quotation mark. Just type in the word you like and QSpread does the rest. In fact at first, QSpread tries if it can get any value out of your entry. If this fails, it assumes that it is a text and inserts a quotation mark automatically. This means also, that errors in formulae like eg. sqrt(-1) appear as text and can be easily edited. Of course, you can still force QSpread to take your entry directly as text if you start as usual with a leading quotation mark.

What are formulae? Formulae are mathematical ideas represented by numbers or functions and operators (+,- etc.). Functions have no fixed value (these are constants like PI), but a value that changes according to their parameter. And what are parameters now? In a nutshell, parameters are values (that are placed in QSpread in parenthesis after the function name) that determine the actual value of the function. If you are interested more deeply in parameters and their influence on the meaning of life, I can only advise you to take some mathematics courses on a university of your choice... but for QSpread enough to know that functions are identified by a name, that they get values passed that are placed in brackets after that name. If a function needs no parameters, the brackets must be given, eg. col().

A list of the supported functions and operations in QSpread is given in in appendix A of this manual, or in the Help-Command. In general, formulae are build as in SuperBASIC, with operators in the following order:

- power (^) is processed first of all
- then multiplication (*) and divide (/)
- followed by add (+) and sub (-)

So the formula $3+5*7$ equals not 56, but 38. If you wish to change the inbuilt rules, you have to put the necessary parts in brackets, then $(3+5)*7$ equals 56.

4.2.1 Percentage

Strictly speaking, taking percentages is no operation in the mathematical sense. Generally speaking, it is in the form:

$$z = x + y\%$$

ie. eg. $120 + 14\%$ equals 136.8 and is in fact calculated like this:

$$y = x + y * (x/100)$$

But I think the concept of percentages is well known to the public since the introduction of taxes. It is only important that percentage calculations will only work together with another value, where the percentages are taken from, that must be found before the number of the percentages taken, ie. $14\%+120$ doesn't make any sense. Of course it can be any of the other operators instead of +.

4.2.2 Variables

Variables is the mathematical expressions for unknown values, where only the name is known. There is something quite like it in QSpread. A variable here is simply the name of a cell, referring to the value contained in the cell with this name... did I lost you?

Example: assuming we have the value 42 in the cell B3, then you can use the expression B3 in any calculation to refer to the value 42, say in cell C3 is the formula $b3*5$. The result 210 is found in cell C3. The cell B3 is said to be a variable, because you can change it any time to say 50, and C3 results automatically (after a calculation, eg. command F3-R) to 250 without changing the formula in C3.

For specialists: there are position dependent (what I described above) and position independent variables (relative and absolute are different names). This becomes interesting when using the ECHO command. Anyway, position independent variables are put in square brackets, like $[B3]*5$ and will refer to B3 even after an echo.

Another note: if you use variable names of cells, that have no or only text content, the value in calculations will be used as 0.

4.2.3 Relative and absolute variables

An absolute variable, as stated above, has to be enclosed in square brackets, relative references are entered as usual.

Relative references can be thought of as a distance from the cell they are used in, to the cell they refer to. For example we have in cell A1 the formula $B2*10$. This is a relative reference to the cell, that is found one column to the right and one row to the bottom of that cell. This relative reference is kept during copy and echo etc.

If you have the following formula:

$B1+10*[A1]$

it means that B1 is a relative cell reference, that is adjusted during copy etc., but [A1] is an absolute reference that always points to A1.

Relative references are getting really interesting in combination with the commands (F4) copy, move and echo, because they are changed there.

4.3 Entering text

4.3.1 Special treatment of text

Text can be used to label values, columns or whatever in a table needs to be labelled. Text is treated a bit different to values, because text may overflow from its home cell into cells following to its right, when not all characters fit into the column width. Text does not overflow if the next cell already contains some data. Non-overflowing text can be either left (default) or right justified inside the cell.

First of all, there are again two ways that enter text information into cells. The simple way of entering words etc. and the way via text functions.

4.3.2 Simple text entry

To enter a simple text into a cell, you simply type in the characters, but make sure your pointer is inside the grid window. QSpread tries to interpret it, and, if it finds out that it was meant to be text, it precedes it with an quotation mark. If you want to force QSpread to assume text, this is done by a leading quotation mark that is followed by the actual text. As you see, it is not necessary to activate the entry line explicitly, you just type in the " and the QSpread knows what to do. The text has an open end, ie. a closing quotation mark is not required. Any quotation marks inside the text will not be affected, they count like characters. As usual, the entry has to be confirmed by enter.

4.3.3 Text functions

There are some functions in QSpread that result in text for the cell contents. These functions (like eg. Day\$() or Month\$()) are entered like their mathematical counterparts, and may have also no, one or more parameters as arguments. Text functions are identified by the dollar sign as the last character, that has no other purpose.

Example: The text function Month\$(1) will result in January for the cell content.

4.4 Special keys during entry

The cursor in the entry line can be used like in just any other pointer based program. SMSQ/E owners have some more extended functions during editing.

The ESCape key breaks out of the entry mode and will not change the contents of the current cell. In list entry mode, the complete entry is stopped, although values that are already entered are kept.

The cursor key up has a special meaning in the QSpread entry line. When it is pressed, QSpread temporarily stops entry mode and presents a special pointer, the question mark. This reminds you that you have to identify a cell, the name of it will be appended to the current entry line and entry mode is resumed. For example, if you have the following in you entry line:

12+3* (the cursor follows the *)

and press the cursor-up key now, you see the question mark pointer in the grid. Now move the pointer to any cell with a value and HIT it. Now you will see in the entry line:

12+3*E6 (if E6 was the cell you just HIT)

Editing continues as normal.

4.5 User defined functions

There are always formulae that are used quite often, and it is unpleasant work to enter it all over again. The QSpread Fn's menu provides a way of storing the often used formulae. When this menu is activated, you see a list of (at present) 5 lines where formulae may be stored. To enter a formulae in a slot, just select it with a DO. Now you can enter the formula as usual (please remember that there is no question mark pointer available here).

To activate a formula found in the functions menu, select it with a HIT or press the according number key. When you move the pointer into the grid window now, you see that it changed to an cross pointer. This pointer shows you that a formula is brought into the next cell selected with a HIT. To get back to the normal pointer without entering a user defined function, just press the right mouse button.

4.5.1 The date-function

The date-function is the small icon next to the entry line which looks like two calendar sheets "1" and "2". It will insert the current date in the default format (which is configurable, see configuration section).

4.5.2 The sum-function

The sum-function, you remember, is the funny looking item in the command line (and it can be selected by the + key). This is a special form of a user defined function, because it is one all users need quite often.

To add up a selected range into a cell is so easy: select the block you want to add (that it is the current block and highlighted) and now activate the sum-function. Now you get the same pointer as during the user defined functions, that puts the sum of the range in the cell that is HIT next.

4.5.3 The Line-function

This function allows you to put a line of the length of the current select range into a cell (preferably the first cell of the range). That is quite useful, if you want to put separation lines in your table, you just select the length of the line as the current range and bring this formula in the first cell.

4.5.4 Special treatment in user defined functions

When QSpread encounters the character sequence `\r` somewhere in the user defined function, it replaces it with the current range when the formula is transferred to the sheet.

That is the way the sum-function is programmed internally, the same as following user defined function:

```
sum(\r)
```

During transfer, the macro `\r` is replaced by the name of the current range, as shown in the Goto command. This provides the basis for interesting combinations.

5 Value representation

5.1 Formatting numbers

Numerical values may get assigned a certain format. This does not change their value, but just changes the way the number is shown. It can be preselected in the Status menu (F5), or fixed using a configuration program.

The Cell menu affects the format of the current range of cells. Please note that when a value is entered in a cell that is already formatted, then this format is used.

If the column is too small for the number to fit it, it is replaced by a number of stars (***) that you realise that something went wrong.

5.1.1 Justification

Values can be justified inside the cell either left or right, meaning that it starts printing from the left or the right hand side of the cell.

5.1.2 Units

The format of numbers is determined in the Units menu. Here you can select the number of decimal places shown. If a values has more decimal places, remaining digits are cut off. If it has less decimal places than specified, they are filled with zeros until the requested length is reached. Possible values are 0 to 8 decimal places.

Negative numbers are usually represented by a leading minus sign, positive number are shown as they are. The function "sign number always" puts a plus sign in front of positive numbers.

Alternatively, the function "brackets when negative" put negative values in brackets whereas positive values are left as they are.

The function "insert separators" splits the integer part of a number into blocks of three digits each separated by a comma (,) for enhanced readability. A configuration program can change the comma to an (').

The german speaking community requires a special numeric format, because there is no decimal point, but a decimal comma, and digit separation is done via points. The function "german representation" takes care of that.

5.1.3 Monetary symbol

The formatted number can be started with one out of six monetary symbols. The usual currencies are held in the list. All symbols can be changed with the configuration program.

5.2 Rounding numbers

The Status menu determines how exact the calculations are to be performed, and when numbers are to be rounded. Rounding affects the results of calculations and I should mention that from 0.5 incl. is rounded to the nearest upward

number.

7 Filter

Filter are small utility programs, that are executed by QSpread during file import or export, as well as during printing, which perform the task of converting data for QSpread or for other programs or the printer.

7.1 Printer filter

The current version of QSpread allows you to print via printer driver. "Another printer driver", you may think!? Yes, but we tried to make it as flexible and as easy at the same time. And, you don't have to use it if you don't like it.

The printer driver can be a simple SBASIC program (called "filter"), which just translates a few characters or reacts on simple codes like "Bold" or "Italics". It can be very complex, if you like - you just do it yourself. It can also be compiled BASIC, and, of course, a filter written in C or assembler. Please note that plain BASIC programs can only be used in SMSQ, not under QDOS or Minerva. On the latter systems, you have to QLiberate the BASIC.

The concept of a filter is very easy to understand: When QSpread prints without a filter specified, it prints directly to an output channel, e.g. PAR or SER or a file. When a filter is activated, the output is sent to the filter. It arrives in channel #0 of the filter, and it is up to the filter what to do with it. It can just forget about it, modify it or send something completely different. The filter prints to #1, from where it goes to the output device (as before, PAR, SER, or file).

You will find sample filters on the QSpread disk which give you an idea what a filter can look like. If you're not familiar with assembler, forget about the assembler filter. Have a look at the BASIC filter instead. It is designed for EPSON compatible printers. If you don't have an EPSON compatible printer, edit the control codes.

QSpread sends codes which are easily identifiable. If the filter does not "know" the code, it should just forget about it. This makes sure, that old filters can cope with more recent versions of the program, and that old programs can use new filters.

The codes start with CHR\$(1), followed by a single-character key, optional parameters, and end with CHR\$(2). The easiest filter you can think of, therefore, ignores everything between CHR\$(1) and CHR\$(2).

We have defined the following keys with the following parameters:

- + Preamble. No parameter. Supported by QSpread.
- Postamble. No parameter. Supported by QSpread.

f Filename of current file: parameter is complete filename Supported by QSpread.
P select Pica (10cpi). Supported by QSpread.
E select Elite (12cpi). Supported by QSpread.
C select Condensed (20cpi). Supported by QSpread.
D set Draft (or economy printing): 1 is on, 0 is off. Supported by QSpread.
H set Highlight: 1 is on, 0 is off.
I set Italics: 1 is on, 0 is off
B set Bold: 1 is on, 0 is off
U set Underline: 1 is on, 0 is off

For cell-based applications (like QSpread, every cell is preceded:

T Text-contents
N Numerical contents
E empty

7.2 Import filter

7.2.1 Data - Numerical data import

This filter is ideal for importing data obtained by a physical measurement unit producing long listings of ascii data.

The Data import filter allows to import plain ascii texts containing numbers separated by space or tab etc. The data is imported by line and for each line the values found is placed in a column. Control sequences (FF,CR, etc.) and alphabetic text is ignored. Scientific notation (1e-5) is also converted.

7.2.2 NewSize - load a table into a different sheet

One of the restrictions imposed by the use of the window manager is that the current sheet size cannot be easily expanded. To allow you to load old data into a sheet of a new size, the filter Filter_NewSize can be used.

The NewSize filter asks for the new size of the sheet and requires a normal QSpread file as import file (strictly speaking it is not a real import of an alien format!). It then builds up a sheet with the new size and the old data in it.

7.2.3 Merge - merge a QSpread file into existing table

The filter_merge allows to merge standard QSpread files into existing tables. First load your sheet, then select the Merge-Filter in the Files Options Menu as your Import Filter, and then Import the sheet you want to add to your existing sheet.

7.2.4 PsionImport - load prepared Psion Export files

Although it would be much nicer to load Psion Abacus (_aba) files directly into QSpread, this is not possible at the current stage and with the current filters supplied. This is mainly because the internal file structure of Abacus files is not

documented by Psion. Nevertheless I am working to get to a suitable filter soon.

The current way of getting your Abacus data into QSpread is via the Psion Export Files. It has to be pointed out that when you are exporting your data from Abacus, you will lose any formulae and only get the current values. Furthermore a trick has to be used in order to get the widths of the columns, which are normally not part of the export information, as well as to force Abacus to export all required columns, because Abacus expects a certain format of the way the columns are organised. (If anyone is interested: see chapter Information - Rules in the QL Manual)

To export your data from Abacus, you take the following actions. For all columns which should be exported, there has to be a text item in the first row of the according column, followed by a blank cell in next row, followed by the width of the current column in the next row.

To simplify your work there is the PsionExport program (which can be normally EXECuted), which installs a Hotkey definition. PsionExport needs to know the key on which the definition has to be put, as well as the name of the last column of the table to be exported (eg. S for 19th column). Then a Hotkey is defined, which you have to activate in Abacus with your table loaded. This hotkey performs all the necessary key presses for export format preparation, the only thing you have to do is to enter the actual filename for export.

The following Abacus commands are used for preparation:

```
F3 - Grid - Insert - Rows - at 1 - number of rows: 3
F5 Goto - A1
A1="x
F3 - Echo - A1 - over range A1:??1
F5 Goto - A3
A3=width()
F3 - Echo - A3 - over range A3:??3
F3 - Files - Export - Abacus/Archive - range - Columns - tofile
```

To load your data into QSpread, you start it as usual, and then execute the function Import from file in the Files menu (F2). After confirmation that you are aware that all your current data will be removed from memory, QSpread expects you to enter the filter name, ie. the name of the program that does the actual conversion work. For Psion Export files, this is the xxx1_Filter_PsionImport program.

You are then presented with the File Selection menu to select the file you wish to import to QSpread. Please make sure that you only select real export files as the filter will not check on the format. Finally, you are asked to enter the size of the new sheet required to hold your data.

7.3 Export filter

The export file format consists of several lines, where the first one contains the widths of the columns separated by <TAB> codes (\$09). The following lines hold the rows of the select block, where the cell contents of the selected columns are also separated by <TAB>'s. This filter format quite handy, in fact it can be

used as an export of ASCII-Tables for text87, when no export filter name is given.

8 Examples

8.1 The example table

This is a short lesson, explaining how the functions of QSpread are efficiently used. Assuming you wish to produce a table of monthly expenses, that should look like this:

Household budget 1991							
	Rent	Water	Telephone	Clothing	Food	Heating	Petrol
January	130.00	60.00	20.00	35.00	100.00	60.00	25.00
February	130.00	55.00	26.00	40.00	80.00	40.00	30.00
March	130.00	62.00	25.00	20.00	95.00	25.00	28.00
April	130.00	49.00	18.00	15.00	86.00	0.00	24.00
May	130.00	64.00	22.00	40.00	65.00	0.00	32.00
June	130.00	65.00	21.00	10.00	120.00	0.00	22.00
July	130.00	50.00	22.00	35.00	40.00	0.00	39.00
August	130.00	52.00	19.00	15.00	50.00	0.00	40.00
September	130.00	60.00	25.00	60.00	20.00	20.00	42.00
October	130.00	48.00	23.00	22.00	85.00	46.00	33.00
November	130.00	45.00	21.00	17.00	75.00	50.00	20.00
December	130.00	48.00	22.20	30.00	87.00	45.00	25.00
	£ 1560.00	£ 658.00	£ 264.20	£ 339.00	£ 903.00	£ 286.00	£ 360.00

First of all, start QSpread (a sheetsize of about 20x20 should be fairly enough).

Now move the pointer into the grid onto cell D1 and select it with a HIT. You just made cell D1 the current cell, and it is displayed in the top right hand corner of the window. Now let's start by entering the headline of the table. Type in the following: "Household budget 1991

The entry line should now show this text. Press the [ENTER] key, in case you didn't do so already, to confirm that this text should be put into the sheet.

If you have misspelled a word, or forgot something like you only entered "Household budget instead of "Household budget 1991 it is easy to correct this. Just press the [TAB] key, and edit the cell contents in the entry line by entering 1991. Press the [ENTER] when you have finished. You see that the text is longer than the text of the cell. In such a case the text overflows into the next cells (E1/F1).

Now the table: The most left column should hold the name each month. To achieve this, select cell B5 as the current cell (with a HIT) and then mark the whole range B5:B16 with a DO in cell B16. The range in column B from row 5 to 16 is highlighted now.

To enter the names of the months, it is possible, but not very wise to enter each name as a text as we did before, like

"January [ENTER] "February [ENTER] etc.

QSpread offers a more helpful function called month\$(x), which puts the name of the month x into the cell. Nevertheless it takes about the same time to enter the functions

month\$(1) [ENTER] month\$(2)[ENTER] etc. so there has to be an easier way.

Activate the all function (F8). From now on, the entered cell will be used for each cell in the selected range. The only formula you have to enter now is:

month\$(row()-4)

The current range should now display each name of the month. The function **row()** returns the number of the current row (or line), and because our selected range starts in column 5, but we want the month names to start with the first, we have to subtract another 4.

In column on the right of the month names, there should be a vertical line to separate the data. Now select the range C5:C16 and ensure that the all function is still activated. Now enter

"|

As you see, the column now hold the vertical line. But the column should only hold this line, so it is a bit too wide.

To change the width of this column, you activate the function **change column width** in the Grid menu (F3). This pops up another window where you can enter the width of column C in characters. Please enter now the value 1 at the new width item and leave this menu via OK. The grid is now redrawn with column C changed to 1.

Now select range D3:J3 and deselect the all function. Enter the column headings:

"Rent [ENTER] "Water [ENTER] "Telephone [ENTER] ...

Now it is time to enter the values into the range D5:D16. Because the values appear in monthly order, it makes sense to enter all values for one months, then the next month etc.

Now enter the Status menu (F5) and select the Calculation/Entry-order by **row**, because the values should be entered row by row. Now leave this menu and enter the values for January:

130 [ENTER] 20 [ENTER] ...
25 [ENTER]

You probably noticed that rent is constant during the whole year. Then why enter it all over again? So select the column **rent** in the range D5:D16, activate the all function, select with [TAB] the first value and press [ENTER]. This value has now been taken over in all rows. Deselect the all function again.

Now enter two or three column of data by yourself.

Now let's draw the two lines on top and on the bottom of the table. To draw lines easy and comfortable, it is nice to use the inbuilt functions. First of all, select the range where the line has to be drawn, say B4:J4.

Activate the line function. If you move the pointer into the grid, you recognise the function pointer (cross), that asks you to mark the cell where the function has to be put into. In our case it is cell B4, i.e. the most left cell in the current range.

QSpread now draws a line over the current range. Because the same line appears also at the bottom of the table, you can use the same function and put the formula into cell B17. Now try yourself the put the double line (equal signs) into the bottom most line of the table. (Hint: do the same, and change the formula)

To get the sums in the total line, select the columns holding the values you want to add, then activate the sum-function (+) and put the formula into the corresponding cell.

To adjust the totals line so that it also displays the pounds symbol, you just select this line as the current range, and then activate the function **monetary symbol** in the Cell menu (F4). Now select the pounds symbol from list of symbols shown.

8.2 The multiplication table

Here is a simple example to explain the rather confusing echo function as well as absolute and relative references:

Factor:	13.00
1.00	13.00
2.00	26.00
3.00	39.00
4.00	52.00
5.00	65.00
6.00	78.00
7.00	91.00
8.00	104.00
9.00	117.00
10.00	130.00

Enter the text "Factor in cell A1, and the value of that factor, say 13, in cell B1.

Now select the range A3:A12, activate the F8 All function, and enter row()-2 to be the formula for that range. This creates a list of numbers from 1 to 10. Now deselect the All function again.

To get the results, you have to multiply the value in column A with a factor of 13. Select cell B3 now. It would be possible to enter A3*13 as the formula, but as we want to be as flexible as possible, we give the cell containing the factor.

So enter the formula

A3*[B1]

A3 is a relative reference, because we don't always want to have the value 1, but the value in the current row. [B1] on the other hand, has to be an absolute reference, because we want to access the factor and not always the value in the cell two rows above the current cell.

The last thing to do is to activate the echo function for the rest of cells in the table. Select the range B3:B12, activate the echo function (via F4 Z, or CTRL-Z in the grid). Now select cell B3 with the echo pointer and you see that the remaining part of the table is filled in.

To get any other multiplication table, you simply have to change the value in cell B1 and recalculate the whole sheet. That's it.

9 Command reference

9.1 Help (F1)

This command shows a help text. The name of the help file can be configured.

9.2 File (F2)

- Forget sheet

This command removes the current sheet from memory and provides a new, empty one. The size of the new sheet can be adjusted by selecting the required number and entering the new size. The default number can be changed with a configuration program. If you want to create a new grid of a different size, CURSOR UP and DOWN brings you from row to column and vv. You don't have to select each separately. Furthermore, these settings are retained for the next "forget".

- Load sheet ..

With this function a new sheet can be loaded from a medium into the memory of QSpread. Selection of the filename is done through the File Select window of the menu extensions. Only files ending with _tab are displayed. The old sheet will be removed with this operation and can not be retrieved. The file ending can be changed with a configuration program. Shortcut keystroke is CTRL L.

- Save current sheet

This saves the current sheet into a file using the QSpread file format. If the sheet is unnamed, the current data default drive is suggested. In case the file name does not end in the ending _tab, it is appended. If the file already exists, and if the backup facility is selected (Status menu), a copy of the old file is made. Otherwise you are asked if you want to overwrite the old version. If there is already a file connected to the sheet, this name is used. The file ending can be changed with a configuration program. Shortcut keystroke is CTRL V.

- Save with new filename ..

This performs the same actions as Save current sheet, but you are always asked to select a filename for the sheet, even if there is already one connected. Shortcut keystroke is CTRL N.

- Import from file ..

This command can import files which are not in the QSpread file format. You have to name an import filterjob which does the conversion.

- Export to file ..

Like the import functions, it is the QSpread file format which gets converted by an export filter into a different file format. The filter and the destination file have to be selected, and the data is stored in the changed format in the file. If the file already exists, it is asked to allow overwriting it.

- Block into scrap

The current range is brought as text into the scrap, and can, from there, be used in other programs which have scrap support (like QD). Data already in the scrap will be overwritten.

- Mark page

Selects the current page according to the printer settings.

- Print current page

One page is printed in the given size starting from the current cell. Printing is done through the printer filter to the given port. All values can be changed in the change-printer-options menu. Shortcut keystroke is CTRL P.

- Print current block

The current range is printed through the printer filter to the selected printer port.

- Formulae report

This prints (!) all formulae in the selected range to your printer, separated by tabs. You probably won't need this, but for those who know what to do, it is now there. Never mind.

- Change print/filter options

QSpread does not put the data directly into the port, where the printer is connected, but uses a "printer driver" to convert the internal format into real control sequences. The advantage of the approach is that a great variety of printer can be supported without changing the program, you have just to select the right driver, which have to take care of the right printer format. This allows the support even exotic printers or multiple printers. See section "printer drivers" below. If there is not filtername given, text output will be plain ASCII. You can also change the name of the printer port in this menu, as well as the number of lines and characters per page. All these values can be changed with the configuration program. It is also possible to select different printout widths. Pica is 10cpi, Elite 12 and condensed 20. Draft mode can be selected. Form Feed enables or disables a formfeed at the end of a page.

You can also change the import and export filters in this menu.

9.3 Grid (F3)

- Recalculate grid

This menu entry recalculates the complete sheet. This is important for formulae having cell references, whose result is determined by other cell values. Calculation is either done by column or by row according to the selections in the status menu). Shortcut keystroke is CTRL R.

- Change column width

With this the width of a column can be changed. This function operates on all column in the current range. The maximum width is 60 characters, the minimum is 1 character. If there are any numeric results, which wouldn't fit into the column, this cell is filled with stars (*). Text is automatically adjusted. The initial column width can be changed with a configuration program.

- Perfect column width

This command adjust the size of all selected columns to suit its longest entry. This command is available through the toolbar by DO'ing the change width icon.

- Select column

This function marks the column where the current cell is in as the new current range.

- Insert columns

This function puts QSpread in the insert column mode. The insert-pointer appears and after a hit QSpread asks for the number of columns to be inserted. Everything that war right of the starting column is moved by the requested number of column to the right, producing new empty columns there. Because the sheets size is fixed, the last column in the sheet is removed. References in formulae are updated to refer to the correct cell. Shortcut keystroke is CTRL K.

- Delete columns

The delete-column-pointer appears after the selection of this function and when the according column is hit QSpread requests the number of columns to be deleted. After a confirmation (see Status) the cells will be removed from the grid and everything that was on their right will be moved to the now empty position. At the end the sheet, a blank columns will be inserted. References in formulae are updated to refer to the correct cell.

- Select row

This function marks the row where the current cell is in as the new current range.

- Insert rows

This function puts QSpread in the insert row mode. The insert-pointer appears and after a hit QSpread asks for the number of rows to be inserted. Everything that war below the starting row is moved down by the requested number of rows, producing new empty rows there. Because the sheets size is fixed, the last column in the sheet is removed. References in formulae are updated to refer to the correct cell. Shortcut keystroke is CTRL W.

- Delete rows

The delete-row-pointer appears after the selection of this function and when the according row is hit QSpread requests the number of rows to be deleted. After a confirmation (see status) the cells will be removed from the grid and everything that was on below will be moved up to the now empty position. At the end a the sheet, blank rows will be inserted. References in formulae are updated to refer to the correct cell. Shortcut keystroke is CTRL O.

- Search ..

This function allows to search for specific cell data, or parts of the formulae. The search can be upwards or downwards, where the actual order in which the cells are scanned depends on the order given for entry and recalculation in the Status menu. The F9 Again function repeats the last search. Shortcut keystroke is CTRL S.

- Quit QSpread

This finally removes QSpread and the current sheet from memory. Shortcut keystroke is CTRL X.

9.4 Cell (F4)

- Erase range

The current range will be cleared after confirmation. The confirmation request state can be changed with a configuration program. Shortcut keystroke is DEL.

- Copy range

The copy-pointer appears and, after a hit, copies the current range to the new position, which top left hand corner has been select. It is important to know that the formulae are copied, which means that relative cell references using functions like col() etc. are also relative to their new position, whereas absolute references (eg. [C8]) are kept. Normal reference are adjusted. Be careful with overlapping regions, because copying is done cell by cell. Shortcut keystroke is CTRL Y.

- Move range

This function works the same way as the copy range functions, but it clear the cell where the formula came from. Shortcut keystroke is CTRL U.

- Units ..

This allows you to change the number format in the current range. Details can be found in section 5.1.2.

- Currency symbol ..

This allows to introduce a numeric value in the current range with a new monetary symbol. All symbols can be configured. Details can be found in section 5.1.3.

- Justification

This allows to display numeric values in the current range to be left- or right justified. Details can be found in section 5.1.2. Shortcut keystroke is CTRL T.

- Echo over range

The echo function takes the content of one cell and uses this formula for the whole selected range. Thereby any relative references are adjusted accordingly. First of all, select the range over which the echo should be performed. Then you activate the echo function. If you move the pointer into the grid, you identify the echo-mode pointer. Use this pointer to select the cell which should be used for echo, with a hit. Shortcut keystroke is CTRL Z.

- Protect range

It is possible to protect a cell or a range of cells against modification. Select the cell or the range and then select Protect range. To unprotect, select cell or range and then Unprotect range from the menu or the toolbar.

- Unprotect range

Unprotects a selected cell or range (see above).

9.5 Status (F5)

- Calculation/Entry order

The order for entering data or calculations can be switched between column and row. The default value can be changed with a configuration program.

- Auto-calculation on input

When on, the complete sheet is recalculated after each entry. c.f.: Grid-Recalculate The default value can be changed with a configuration program.

- Cursor-move after input

Possible settings can leave the cursor over the current cell, move it downwards or to the right.

- Backup file on save

When activated, an existing file with the same filename is copied into a backup file ending in _bak. An existing backup file is replaced. The default value can be changed with a configuration program.

- Confirmation request

If selected, QSpread will ask before it continues with "destructive" actions, like erasing a large range of cells, file overwrite etc.

- Local directories

A local directory for data storage is supported. This is configurable, and can be changed in the status menu (F5). This directory is presented when loading, and is suggested by the save sheet command. Any changes of the local directory in the load file selection window will be used by the main program.

Here you can also change the local directories for filters, printer drivers and help files.

- Toolbar

This options allows you to switch the Toolbar off (and back on again, of course), if you think your grid area is too small and you are desperately determined to use the space required by the toolbar.

- Global units ..

This allows you to change the number format in the current range. Details can be found in section 5.1.2. The default value can be changed with a configuration program.

- Global currency symbol ..

This allows to introduce a numeric value in the current range with a new monetary symbol. All symbols can be configured. Details can be found in section 5.1.3.

- Global number justification ..

This allows to display numeric values in the current range to be left- or right justified. Details can be found in section 5.1.2. The default value can be changed with a configuration program.

- Format numbers

If selected, numbers will be formatted under the current global settings, otherwise kept as entered.

- Round decimal places

The number of decimal places can be entered here. Details can be found in section 5.2. The default value can be changed with a configuration program.

- Empty if zero

A cell with the numeric value zero can be left blank. This does not affect the numeric value. The default value can be changed with a configuration program.

- Empty if same as above

A cell with the numeric value of the cell above can be left blank. This function has been included for long columns of data, where only values are listed if they differ from the previous value. This does not affect the numeric value. The default value can be changed with a configuration program.

- Set digit names ..

This function pulls down another window, where you can determine the names used in the digit spelling function digit\$. This allows you eg. translations into other languages.

10 Configuration

QSpread can be intensively adjusted to your special need. To do this you simply have to start the Menuconfig_english program by simply EX/EXEC from SuperBASIC or execute from QPac2 files menu.

Please **ONLY CONFIGURE YOUR BACKUP COPY** and **NEVER THE ORIGINAL DISK**.

There are three separate configuration blocks in QSpread: the **GENERAL** block, which anyone should check to set the information needed to get the program running properly on your system. The **NUMBERS** blocks contains all data that is related to numbers and their representation in general. And finally the **SPECIAL** block, which can be used to change the special behaviour of some QSpread functions.

11 Command line switches

QSpread can be started with an options command line (from SuperBASIC or QPac2 etc.). On startup, the following parameters can be passed to the program:

```
\f filename   load the given QSpread file directly after initialisation
\h directory set the directory for help texts
\d directory set the directory for filter jobs
\e extension set the filename extension for QSpread files
```

Appendix A - Formula parser functions

c : cell reference eg. E5 (rel.) or [E5] (abs.)
x : a number, result of
function, or c eg. -12.34
r : range as c:c eg. B2:F6 or [B2]:[F6]
a : one character eg. -

A.1 Numerical functions

abs(x)

results in the absolute value of x, ie. the value without a possible minus sign.

abs(5) = 5
abs(-6) = 6

sgn(value)

Returns -1 if value is negative, 0 for 0 and +1 for any positive value.

cos(x)

calculates the cosine of x (x is in radians)

sin(x)

calculates the sine of x (x is in radians)

tan(x)

calculates the tangent of x (x is in radians)

cot(x)

calculates the cotangent of x (x is in radians)

asin(x)

calculates the value in radians, whose sine is x

acos(x)

calculates the value in radians, whose cosine is x

atan(x)

calculates the value in radians, whose tangent is x

acot(x)

calculates the value in radians, whose cotangent is x

sqrt(x)

calculates the square root of x; x must be positive!

ln(x)

calculates the natural logarithm of x (base e)

log(x)

calculates the logarithm of x (base 10)

`exp(x)`
calculates e to the power of x

`rint(x)`
rounds x to the nearest integer
 $\text{rint}(0.3) = 0$
 $\text{rint}(2.6) = 3$

`int(x)`
calculates the integer value of x
 $\text{int}(0.3) = 0$
 $\text{int}(2.6) = 2$

`col()`
calculates the number of the columns where the formula is found

`row()`
calculates the number of the columns where the formula is found

`sum(r)`
calculates the sum in the range r
 $\text{sum}(a3:e4) = 42$ (just a value)

`avg(r)`
calculates the average in the range r
 $\text{avg}(a3:e4) = 4.2$ (just a value)

`width(r)`
calculates the column width in the range r
 $\text{width}(a3:e4) = 60$
 $\text{width}(a1) = 10$

`len(c)`
calculates the length of the string in the cell c
 $\text{len}(a3) = 27$ (or something else)

`cnta(r)`
calculates the number of cell in the range r

`cnt(r)`
calculates the number of cell in the range r, that are not equal to zero

`cntnum(r)`
calculates the number of cells which contain numerical contents in the range r

date()

This is a numeric function that takes no parameters. It returns the current date and time, in seconds from Jan 01, 1961. It uses the QL real time clock, so be sure that it is set to reasonable date.

if(cond;true;false)

This function tests the first parameter (the condition). True means not zero, false means zero. If the result is true, the second parameter is returned, if false, the third parameter. All parameters must be given.

A.2 Numeric constants

PI

results to the value of pi (=3.1415...)

A.3 Text functions

rept\$(a,x)

results to a textline, containing the character a, repeated x-times.

rept\$(-,4) = ----

month\$(x)

results to the name of the month x

month\$(4) = April

day\$(x)

results to the day name of x

day\$(3) = Wednesday

digit\$(x)

spells the digits of the integer part of x

digit\$(42) = four two

date\$(sec)

This text function returns the date given in seconds from Jan 01, 1961 in the format dd/mm/yy. This means the date of today will be date\$(date()) and result in eg. 19/09/93. An optional second parameter specifies the output format:

0 returns dd/mm/yy

1 returns dd/mm/yyyy

2 returns mm/dd/yy

3 returns mm/dd/yyyy

You can configure the default representation and separation character.

time\$(sec)

This is another text function that returns the time of the date given in seconds from Jan 01, 1961 in the format hh:mm. This way the current time will be presented with time\$(date()) as eg. 19:48

A.4 Numerical operators

$x + y$
add x to y

$x - y$
subtract y from x

$x * y$
take x y-times

x / y
divide x into y

$x ^ y$
take x to the power of y

(and)
open a new or close the most recent bracket level (up to 16 levels are allowed)

$x + y \%$
add y-percent of x to x itself (other operators are allowed of course)

$x \& y$
returns 1 if x and y are $\langle \rangle 0$

$x | y$
returns 1 if x or y are $\langle \rangle 0$

A.5 Comparisons

$x = y$
returns 1 (true) if x equals y, otherwise 0 (false)

$x \langle \rangle y$
returns 1 (true) if x is not equal to y, otherwise 0 (false)

$x > y$
returns 1 (true) if x is greater than y, otherwise 0 (false)

$x < y$
returns 1 (true) if x is less than y, otherwise 0 (false)

$x \geq y$
returns 1 (true) if x is greater than or equals y, otherwise 0

$x \leq y$
returns 1 (true) if x is less than or equals y, otherwise 0

Appendix B - Technical background

B.1 Memory

QSpread heavily relies on the Window Manager and its window handling routines. These are written in the way, that an application menu (here: the grid) is completely in memory. For each cell then, WMAN expects for display reasons a block of information. Because these information have to be available, even if the cell is not used in QSpread, there is a fixed memory requirement of about 26 Bytes per cell. Formulae and display information are stored dynamically.

Because of the way WMAN works, the cell information are present in memory at least two, sometimes even three times. First of all the formula, then the display information and at last the numeric value, if any. Because every recalculation of the sheet has to provide WMAN with all display information that might be required, this results in longer recalculation times compared to Abacus, as it only needs to supply the display information currently visible. There are some ideas to change this in the future...

Appendix C - File format

This is the format of a spreadsheet file saved with QSpread. The same format has to be provided the QSpread when loading through import filters.

```
*
* fixed format (file header)
*
sfh_init      equ      $00      ; w initialisation code
sfh.init      equ      $4afc
sfh_id        equ      $02      ; l application id
sfh.id        equ      'SPRD'
sfh_vers      equ      $06      ; l version of file format
sfh.vers      equ      '1.01'
sfh_cols      equ      $0a      ; w nr of columns (or 0)
sfh_rows      equ      $0c      ; w nr of rows (or 0)
sfh.len       equ      $0e      ; header length
```

If the spreadsheet size is given as -1/-1, the current layout size will be used when loading. This is only used when importing through filters, to free the filter job from the work to find out the size of the imported file. Any cells which will fall out of the current size will therefore not be loaded.

```
*
* column width format
sfw_wdth      equ      $00      ; b column width in characters
```

The file header information is immediately followed with list of the column width. There must be an entry for each column in the sheet. Entries are allowed to have a minimum of 1 and a maximum of 60 chars. If the size of the sheet was given as -1/-1, these information have to be omitted.

```
*
* cell format
sfc_cnr       equ      $00      ; l cell number (col|row)
sfc_fwr       equ      $04      ; w cell format word
sfc_form      equ      $06      ; s formula standard string
```

The column width information is followed by the cell information. The format word is defined below. The order at loading time is not important, at saving time it is always by row.

```

*
* format word (numeric) definition
fw..dp      equ      0      bit 0..4 decimal places
fw..germ    equ      4      german representation
fw..sign    equ      5      always sign number
fw..brac    equ      6      parenthesis, when negative
fw..sepr    equ      7      insert separators
fw..just    equ     10      clear right just./ set left just.
fw..strg    equ     11      exclusively set for string
fw..msym    equ     12      bit 12..16 monetary symbol

*
* reserved bits in string format (currently not supported)
fw..cont    equ      0      set for continuation string
fw..bold    equ      1      set if bold on output
fw..ital    equ      2      set if italic on output
fw..undl    equ      3      set if underlined on output

*
* environment codes
sfe_id      equ     $00      ; w environment code id
sfe.id      equ     -1
sfe_code    equ     $02      ; w environment code word
sfe.nfmt    equ     $02      ; global numeric format
sfe.sfmt    equ     $04      ; global string format
sfe.fmtn    equ     $06      ; format numbers on/off
sfe.ordr    equ     $08      ; entry order
sfe.auto    equ     $0a      ; auto calculation
sfe.zero    equ     $0c      ; empty when zero
sfe.same    equ     $0e      ; empty if same as above
sfe_val     equ     $04      ; w environment value

*
* macro information
sfm_id      equ     $00      ; w macro code id (=environment code
id)
sfm_code    equ     $02      ; w negative macro number (-1 to -5)
sfm_macr    equ     $04      ; s macro string (max. 2+78 characters)

```

Cell and environment format can be freely mixed, and the most recent entry is the one action taken.

Appendix D - Writing Im- and export filter

The filterjobs that are responsible for the conversion of the file formats are normal QDOS jobs. These jobs get two channels passed in the standard way, one input channel and one output channel.

Because of their definition, it is possible to write filter program in any language capable of producing QDOS jobs which allow channels to be passed. Apart from assembler, QLiberated SuperBASIC or C68 may be used.

It is important that the filterjob closes both channel it got passed after finishing all conversions! It may be possible for a filter job to open windows of its own to ask for specific information required.

QSpread 2001 - Additional features

Formula Parsing

We have improved the parsing. Now, all expressions which do not properly evaluate into a number or numerical expression are automatically treated as a string.

Password

It is possible to protect access to a QSpread sheet with a password. This does not mean that the saved file on the storage device is scrambled etc. As the saved sheets are unreadable anyway, this is not a problem. The protection is not strong, but it will prevent people who you do not want to look at your sheets to do so. Actually, the use of QDOS or SMSQ/E nowadays is a pretty good protection on its own, but if your system is running, people will not be able to view your sheets by loading the files (or starting them through other systems like FileInfo II) without entering the right password.

If you want to protect a sheet: you find a padlock icon next to the filename. Click it, and you will be asked to enter the password. Type it in, and you will be asked to repeat it. You can press ESC at any time to abort this process. As soon as you entered the same password twice, the padlock symbol will invert and signal that the sheet is password protected. When you save it, the (scrambled) password is stored inside the file.

If you want to change or remove protection, click on the padlock icon and type in the current password. Then repeat the new password twice (or press ENTER or RETURN twice for no password). If you ESC, the old password remains set.

When you try to load, merge or import a password-protected file, a window will pop up and request the password.

Please note that the password is not displayed. For every character you type in, an asterisk is displayed to hide it from the views of other people. It is not possible to edit the password (as you do not reliably see what you are doing), you can only delete characters.

PRINT Icon

The action of the Print Icon has changed: if you left-click it, it prints the currently marked block. If you right-click it, it will print a page. You can still access the print options menu through F2.

Units menu

The Units Menu allows you to set the number of decimal places to 0 (no, for integer), 1, 2 or 3. Just press the number or click on the items below the text "Decimal places:". The number in the editable field to the right will reflect the selection. As these are the most commonly used values for the number of decimal places, it will save your time, we hope.

Context Menu

We have added a context menu which you can pop up when you right-click onto a cell of the sheet. The default action under the pointer will be "mark end of the block" so that you can use the mouse for selecting the end of the block with one additional click (but we have added a much neater way of marking the end of the block to compensate for this - now you have three choices - see below).

The other menu items are extracts from the grid and cell menu and very useful at this position (especially the insert and delete row and column items). They allow you to use QSpread with far less mouse moving.

The action of the context menu for block action (Units, justification, column width) will work on the current block provided there is a block marked and you right-clicked onto a cell inside the block. If you right-clicked onto a cell outside the current block, the block highlight is removed and the action will work on the currently right-clicked cell. You will find this very useful once you got used to it.

Mark End of Block

This is the nice, new feature we mentioned in the paragraph above. If you left-click onto a cell, you mark the start of a block (as before). Hold the SHIFT key down while you click and you mark the end of the block. How long are we missing this feature?

Filters

We had to change the filters to cope with the new file format (which incorporates the password). All filters are Version 3 filters and you should only use these for QSpread 2001. When we modified the filters, we discovered that the first designer of QSpread (Oliver Fink) has not put proper checks into the filters. Old filters will not warn you but can lead to crashes. We have fixed this in V3 filters.

In order to help you identifying what is what, we have added new filename extensions to the filters. `_imf` is used for import filters, `_exf` is used for export filters. Once again, please use ONLY Version 3 filters.

Other Improvements

You will probably notice other changes which you will find more convenient. We have also fixed some minor bugs, which you hopefully have not noticed in the past. New features are:

- Export suggests a constructed filename instead of nothing.
- Import does not clear suggested filenames anymore.
- Security checks on file versions.
- Filename parameter (and others) can now have full QDOS length (41 characters).
- QSpread file format 1.02, 1.03 and 1.04 supported.
- String input requests do not pull cursor/pointer away from current position.