

QPC1

This is a quick&dirty redacted version from the original 1996 manual. The original English was quite bad (not written by me, but frankly my English wasn't any better back then). I've fixed what I could find in the short time.

Prerequisites

QPC requires at least a PC with a 486 CPU. A 386 would be too slow and QPC uses the extended commands of a 486. The emulator has a very tricky and unconventional memory control, which basically enables such a fast emulation. By this QPC is not compatible with operating system running in protected mode such as Windows 3.xx, Windows 95, OS/2, Unix ... and with memory managers like EMM386, QEMM etc.. QPC runs perfectly under DOS up to version 7.0 (delivered with Windows 95) or compatible systems, but needs a special boot process.

MS-DOS configuration

Following is a short description of how to setup CONFIG.SYS and AUTOEXEC.BAT for QPC.

Also examples for a boot disk and a boot menu are given below. A boot disk must be formatted as a system disk, e.g. "FORMAT A: /S" or when it is already formatted "SYS A:". Then only the CONFIG.SYS and AUTOEXEC.BAT files must be copied to the disk.

Following an example to implement a boot menu in CONFIG.SYS and AUTOEXEC.BAT:

Old: CONFIG.SYS

```
LASTDRIVE=H
BUFFERS=15,0
FILES=50
STACKS=10,256
COUNTRY=049,,C:\DOS\COUNTRY.SYS
PATH=C:\DOS;C:\WINDOWS
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS HIGHSCAN
DOS=UMB,HIGH
DEVICEHIGH=C:\SOUND\CD\TOSHV210.SYS /D:MSCD001
INSTALLHIGH=C:\DOS\SHARE.EXE /I:100 /f:6144
```

Old: AUTOEXEC.BAT:

```
@ECHO OFF
PROMPT $P$G
PATH=C:\DOS;C:\WINDOWS
LH C:\DOS\KEYB GR
LH C:\MOUSE\MOUSE.EXE
LH C:\CD\MSCDEX.EXE /D:MSCD001 /M:12
C:\DOS\SMARTDRV /X
```

New: CONFIG.SYS

```
[MENU]
MENUITEM=STA,Standard
MENUITEM=QPC,QPC Emulator
MENUDEFAULT=STA,10
```

```
[COMMON]
LASTDRIVE=H
BUFFERS=0,15
FILES=50
STACKS=10,256
COUNTRY=049,,C:\DOS\COUNTRY.SYS
PATH=C:\DOS;C:\WINDOWS
```

```
[STA]
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS HIGHSCAN
DOS=UMB,HIGH
DEVICEHIGH=C:\CD\TOSHV210.SYS /D:MSCD001
INSTALLHIGH=C:\DOS\SHARE.EXE /I:100 /f:6144
```

```
[QPC]
DEVICE=C:\DOS\HIMEM.SYS /INT15=4096
DEVICEHIGH=C:\CD\TOSHV210.SYS /D:MSCD001
```

New: AUTOEXEC.BAT

```
@ECHO OFF
PROMPT $P$G
PATH=C:\DOS;C:\WINDOWS
LH C:\DOS\KEYB GR
LH C:\MOUSE\MOUSE.EXE LH C:\CD\MSCDEX.EXE /D:MSCD001 /M:12
C:\DOS\SMARTDRV /X
GOTO %CONFIG%
```

```
:QPC
CD QPC
QPC
```

```
:STA
```

For details of the boot menu definitions please refer to your MS-DOS manual.

Details of how the CONFIG.SYS should look like:

1. First all the standard things like

```
SWITCHES=/F
LASTDRIVE=H
COUNTRY=049,,C:\DOS\COUNTRY.SYS
```

...

should be present, this shall not be treated in details here.

2. As mentioned above, QPC does not work with Windows, OS/2,.. and memory managers like EMM386, QEMM,... , as these switch the processor from real mode to protected mode, which is not compatible with the QPC memory management. Nevertheless the emulator is kept compatible with HIMEM.SYS to allow the usage of SMARTDRV or similar disk caching software. These can, but must not be used.

e.g. `DEVICE=C:\DOS\HIMEM.SYS /INT15=4096`

The amount of memory at /INT15 is the size in kilobytes which shall be reserved for QPC. This size must be as large or larger than the configured size with SMSQE. One Megabyte is 1024 Kilobytes so the figure for 3 MB is 3096... SMSQE can be set to 16 MB maximum.

Attention: Never use DOS=HIGH, as then MS-DOS is loaded into the upper memory which makes QPC refuse to start.

3. In case you intend to use the CD-Audio functions of QPC, you should load the necessary drivers for your CD-ROM.

e.g. `DEVICE=C:\CD\CDROMDRV.SYS /D:MSCD001`

The driver name (here CDROMDRV.SYS) and the drive name (here MSCD001) may be different for your system. MSCDEX can be loaded in the AUTOEXEC.BAT as with your normal configuration, though it is not necessary with QPC. If it is not loaded, you must specify the drive name (here MSCD001) as a parameter with QPC.

The AUTOEXEC.BAT file might look like this:

```
Some quite usual things
@ECHO OFF
PROMPT $P$G
PATH=C:\DOS;C:\WINDOWS
KEYB GR
...
```

If the command line interpreter COMMAND.COM is not in the root directory of drive C:, the COMSPEC variable must be set that QPC can find it.

e.g. `SET COMSPEC=C:\DOS\COMMAND.COM`

To use the mouse with SMSQE, you must load a mouse driver:

e.g. `C:\MOUSE\MOUSE.COM`

If HIMEM.SYS was loaded in the CONFIG.SYS, SMARTDRV can be loaded here

e.g. `C:\DOS\SMRTDRV.EXE /X`

The parameter /X is available from DOS 6.1 and deactivates the write cache. It is recommended to use it, as otherwise when the machine crashes data might get lost.

QPC configuration

The SMSQE.Bln file contains a standard QJump v1 configuration block. It can be configured within QPC or by using the supplied CONFIG.EXE file to change the settings from MS-DOS.

The following options are available in the Config block:

Display size: here the screen resolution can be set.

Memory size (in Megs): this is the memory size in Megabytes that QPC shall use. If the number is higher than the available size, all free PC memory is used.

If floppy disk inserted boot from: Here the boot disk drive is set. If one is set QPC will try to find a BOOT file there first.

Otherwise boot from: This option sets the hard disk boot drive. QPC will try to find a BOOT file there if no disk is inserted (see above).

PAR printer port: Determines the port for the PAR device.

SER1 serial port: Determines the port for SER1. Normally COM1 is connected to IRQ4. If the mouse is connected to COM1 you must set the port to None, otherwise the mouse is not working in SMSQ/E.

SER2 serial port: Determines the port for SER2. Normally COM2 is connected to IRQ3. If the mouse is connected to COM2 you must set the port to None, otherwise the mouse is not working in SMSQ/E.

Country code: Sets the default language for the keyboard layout and the error messages. Possible values are the international telephone country codes (33: French, 44: English, 49: German)

Mode number for 800x600 graphics: The 800x600 graphics mode has never been standardised. If you encounter problems with the quite normal Mode 106 (\$6A) you should set the mode according to your graphics card (look in the manual of your card for the 16 colours 800x600 mode). If you can't find an appropriate information, try the values 88 (\$58), 41 (\$29), 84 (\$54), 22 (\$16) or 121 (\$79). Please enter the decimal number (the value without a \$).

Filename for WINx: Gives a PC-filename for each WIN device. With QPC in contrary to the QXL, which only can use the logical drives C: through J: on the PC side to generate a QXL.WIN file, the QL hard disk partition (which is simply a file on the PC side) can be mapped to individual file names at any location. So you can already have WIN1 through WIN8 with only one logical hard disk drive on your PC. Please notice that the structure of a QXL hard disk file QXL.WIN is the same as for QPC, so any QXL.WIN can be accessed from QPC and v.v.

QPC Command line

All options can also be set as command line parameters for QPC. Possible parameters are (instead of the hyphen '-' a slash '/' can be used too):

-R(run)	this parameter starts the emulation immediately without waiting for a key press
-M:x	set the memory size. X can be a value from 1 through 16
-V:x	set the screen mode. X can be set to values 0 through 3: 0 is 512x256, 1 is 640x350

2 is 640x480
 3 is 800x600
 -F:x set the boot disk device.
 0=None
 1=FLP1
 2=FLP2
 -W:x set the hard disk boot device. X can be 1 through 8
 -P:x set the printer port.
 0=None
 1=LPT1
 -CX:y set the SER port x (range 1 to 4). Where y is 0 for None, 3 or 4 for the IRQ.
 -CC:x set the default language. Possible values are the country codes

Example:

QPC -r -v:3 -m:4 -w:2

Start QPC without waiting for a key press, in 800x600 video mode, with 4MB RAM and boot from WIN2.

QPC /f:2 /v:2 /c1:3 /cc:33 /p:0

Start QPC in 640x480 mode, connect SMSQE SER1 to COM1/IRQ3 (which is not quite normal), don't use the printer port, boot from FLP2_ if a disk is inserted and speak French.

Please notice: all other values are taken from the config block!

QPC control

There are four special key combinations QPC reacts on. For safety with all of them at least three key are involved.

SHIFT+SysReq (=SHIFT+CTRL+PrtSc): Contrary to a normal warm reset (CTRL+ALT+SHIFT+TAB) the operating system is loaded anew and also restarted. That is quite useful if parts of the operating system were overwritten. The hardware is not initialised again.

SHIFT+CTRL+ScrLock: This key combination terminates the emulation. Unlike the QXL, which has its own memory and can be restarted from the actual stage, QPC is really terminated and the memory is released. Therefore you should be sure to have your work on the SMSQ side really finished, all files closed etc. For safety you should wait some seconds in case something is still in the drive caches. Attention: this key combination works only from within a working emulation. If QPC, by whatever reason, has crashed, it won't work.

SHIFT+Break (=SHIFT+CTRL+Pause): Does the same as the above SHIFT+CTRL+ScrLock but is a little bit more radical. This combination should always work if the PC is not completely crashed. QPC is terminated as legally as possible. For safety you should restart your PC after that.

SHIFT+CTRL+ALT+SCROLL: Here the emulator is deactivated temporarily and a DOS-Shell is started. The DOS-Shell is terminated by EXIT. Then the emulation should continue from the point it was left off. There are some limitations: It would be a too complicated task to save the whole status of QPC, especially the status of the hardware. Therefore from within the temporary DOS-Shell only programs which leave the system in the stage it was before should be used. Also be aware of programs that use the graphics, as it could lead to unexpected

results, especially when SMSQ is in 800x600 mode. The source of the problem is within the BIOS of the graphics adapter and not QPC. Programs switching to protected mode will either not start at all, crash or refuse to re-enter QPC. Simple actions with all DOS-commands should normally work without any problem.

Some technical explanations

Processor emulation

- QPC emulates the complete 68000 instruction set
- Nevertheless the SMSQ identification tells it is a 68010, as this prevents some C programs from trying to detect the processor type themselves and thinking they have a 68020 on their hand.
- All illegal instructions and all addressing modes are trapped.
- The F-line emulator works as usual, the A-line emulator is only used for the communication with the PC-hardware.
- Like the 68020 word and longword data can be read from and written to odd addresses. In contrary to all 68xxx processors that is also true for all processor instructions. A permanent control of odd addresses would slow down the emulation too much.

Screen emulation

- Instead of emulating the 512x256 mode by slow software, the VGA hardware is set to this PC-untypical resolution. The visible screen area is 640x350, only the screen memory is manipulated accordingly. This is tested on many graphics adapters and never did lead to a problem.
- The 800x600 mode unfortunately has never been standardised in the PC-world. The used 06Ah mode should normally work. For safety it is configurable.
- Only one screen page is supported.
- The screen is not updated periodically. QPC checks any write access for screen operations. This is not true for instructions which access the stack explicitly (JSR, BSR, PEA ...).
- The hardware register at address \$18063 is also actualised, but will only be checked on special demand.

Real time clock

The clock is emulated by re-programming the RTC-chip of your PC. The time used for this operation (some milliseconds each second) can be neglected. Unfortunately some Laptops seem to have a problem: if the computer switches to standby or another energy save mode, the clock can not be refreshed any more and restarts only when the system is woken up. To adjust for such problems, every 3 minutes the SMSQ clock is reset to the PC clock.

QPC Display

DISP_TYPE

The DISP_TYPE function is used to find the type of display. For QPC, this is an emulation of the standard QL display so DISP_TYPE always returns 0.

if DISP_TYPE : PRINT "This is not a QL display"

DISP_SIZE

DISP_SIZE (xpixels, ylines) is used to set the display size. The nearest feasible size will be selected by the driver. It is best not to change the display size when the pointer sprite is visible, or you may get some spurious blobs left on the display. There should be few other problems changing from a smaller size to a larger size. You should, however, avoid changing from a larger size to a smaller if there are any windows outside the smaller screen. Values that are well out of range are ignored.

DISP_SIZE 800,600 change to 800x600 (SVGA)
DISP_SIZE 1 ignored.

Serial (COM) Ports on the PC

Unlike the basic SMSQ serial port drivers, the SMSQ/E serial port drivers are dynamically buffered. There is, therefore, no need to use the PRT device.

The Baud rates supported by SMSQ/E on QPC are 57600 38400 19200 9600 4800 2400 1200 600 300

If one of the ports is already committed to a mouse, the BAUD command will not affect it.

BAUD 19200 set both ports to 19200
BAUD 2,1200 reset SER2 to 1200 baud

PC Printer Port

The PAR device drives the PC printer port. By default, output is dynamically buffered: the PRT device is not required.

PC Floppy Disks

SMSQ/E accesses the PC floppy disks via the BIOS calls. This, although it allows almost any PC to be used as a host for the QXL, is dependent on the efficiency of your BIOS. The efficiency can usually be greatly improved by using one of the public domain BIOS level cache utilities that are available for the PC.

Floppy Disk Driver Name

The default name of the floppy disk driver is FLP. A: is FLP1 and B: is FLP2.

FLP_USE

FLP_USE may be used to set the name of the FLP device. The name should be 3 characters long and in upper or lower case.

FLP_USE mdv	The FLP device is renamed MDV
FLP_USE FLP	The FLP device is restored to FLP
FLP_USE	The FLP device is restored to FLP

PC Hard Disks

SMSQ/E accesses the PC hard disks via the PCDOS calls (the BIOS calls do not appear to work). This, requires a file (called QXL.WIN) to be set up in the ROOT directory of any hard disk you wish to use as a QDOS format disk. This file is the QDOS format disk.

Hard Disk Driver Name

The default name of the hard disk driver is WIN. C:QXL.WIN is WIN1, and D:QXL.WIN is WIN2 etc.

WIN_USE

WIN_USE may be used to set the name of the WIN device. The name should be 3 characters long and in upper or lower case.

WIN_USE mdv	The WIN device is renamed MDV
WIN_USE WIN	The WIN device is restored to WIN
WIN_USE	The WIN device is restored to WIN

QPC Troubleshooting

Mouse and/or serial port does not work

Please note that the COM-device to which the mouse is connected has to be configured to "none" in SMSQ/E. Also, make sure that the interrupt which is used by the mouse is not used by any serial port (i.e. if the mouse uses INT4, neither SER1 nor SER2 must use INT4!).