**How to Make Minerva from Source**

These instructions will not tell you how to produce a Minerva EPROM, only the software to go on such an EPROM. The result should, however, run on Qemulator, uQLx and possibly other emulators without any further steps.

No assembler, linker, Make or cct programs are included with these sources. If you dont already have these programs installed, you need to acquire and install them first.

A free suite of programs may be found included with the SMSQ/E sources, from <www.wlenerz.com/smsqe/>. The instructions given below are for those programs. By convention the SMSQ/E sources (and hence Make & al) are installed under dev8\_

1. Unzip the file m198src.zip to win1\_. Unzip will create the directory win1\_M\_, if it doesnt already exist, and all the source files will appear in sub-directories under that.

2. Load the extensions required by Make, eg
LRESPR 'dev8\_extras\_source\_outptr\_bin'
LRESPR 'win1\_rxt\_QLib\_ext'

3. Point your program directory towards the Linker etc executables, eg
PROG\_USE 'dev8\_extras\_exe'

4. Fire up Make:
EX 'dev8\_extras\_exe\_Make'; 'win1\_M\_ROM\_link -l'

This should only take a minute or two, depending on your system, and produces a binary of 48,822 bytes, called win1\_M\_ROM\_exe.

5. Run the following program to pad the binary file to 48k (Needed for some emulators, like Qemulator.):
 100 adr = ALCHP(48 \* 1024)
 110 LBYTES 'win1\_M\_ROM\_exe', adr
 120 SBYTES 'win1\_M\_Minerva198\_rom', adr, 48 \* 1024
 130 RECHP adr

The above should work fine on a SMSQ/E system. However, to do the same under Minerva itself, some changes need to be made to get it to work:

The DEV\_rext 2.02 toolkit I have does not work under Qemulator, but may work with another emulator or a hardware QL (works fine in uQLx). Other (older or later) versions of DEV may also work. DEV is only required to make SMSQ/E, so the work-around is to use a real device instead, eg win3\_, or to copy the files

 dev8\_extras\_exe\_qmac
 dev8\_extras\_exe\_linker
 dev8\_extras\_exe\_cctf

and either (see \* below)

 dev8\_extras\_exe\_Make

or

 dev8\_extras\_source\_make\_bas

to a more convenient location and point prog dir in its direction.

\* I was not able (within a few minutes) to get the compiled version of Make to work despite adding toolkits such as

 LRESPR 'win2\_ptr\_gen'
 LRESPR 'win2\_wman'
 LRESPR 'win2\_hot\_rext'
 LRESPR 'win2\_QPtr'

The work-around is to load the toolkits etc, as described earlier, then load and the SuperBASIC program make\_bas, and modify line 230 to read:

 230 cmd$='win1\_M\_ROM\_link -l':INK #msgch,7

RUN the program. Do the padding afterwards, if required.

And that should be it! Happy QL-ing!

pjw, 2015

**Tests:**

1) Make on QPC2 with SMSQ/E ok.

2) Fired up Qemulator with the ROM file produced in (1) to Make itself from scratch:

3) Make on Qemulator with the output of (2) as ROM, ok. But modifications as described above required.

4) Used the output of (3) to run under uQLx. Both padded and unpadded versions worked fine. Even DEV works, so could probably Make from within uQLx as per instructions for QPC2/SMSQ, above.