Emu41p: Emu41 for the HP Portable Plus - notes

This document only describes specific Emu41p operations. Refer to the regular Emu41 documentation for more information on general Emu41 operations.

Minimum configuration

The Portable Plus must have **256kb minimum RAM**. It must be configured to provide at least 192kb of Main RAM for the default configuration. Of course, the Portable Plus must be **equiped with the Software Drawer with 2 adjacent free sockets** to hold the EPROM set.
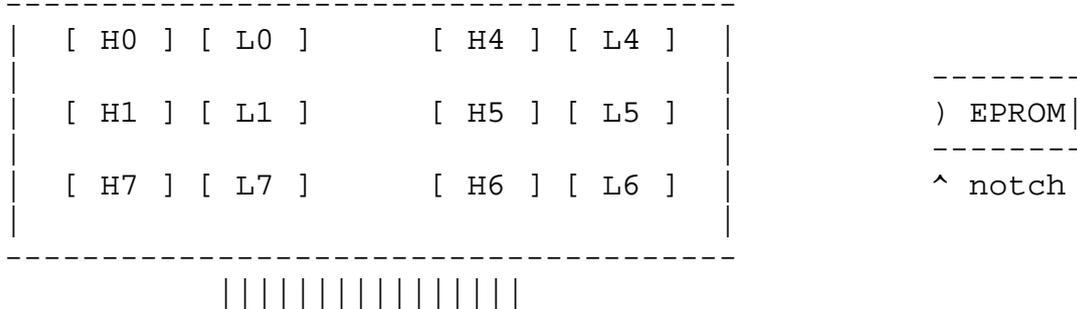
More RAM memory will be needed if you install more ROM images (each 4kword page uses 8kb main RAM). A confortable configuration is 512kb RAM configured as 256kb main RAM and 256kb for Edisc A.

EPROM installation

The two Emu41 EPROM must be installed in the Software Drawer. Pay attention that EPROM are electronic parts that are sensitive to electrostatic discharges, it's a good practice to touch a metallic ground to discharge oneself before handling the parts.

Here is the procedure:
- Open the Software Drawer (2 screws to remove, on the bottom face of the Portable Plus):

```
  ----------------------------------------
 |   [ H0 ] [ L0 ]        [ H4 ] [ L4 ]   |
 |                                        |           --------
 |   [ H1 ] [ L1 ]        [ H5 ] [ L5 ]   |           ) EPROM|
 |                                        |           --------
 |   [ H7 ] [ L7 ]        [ H6 ] [ L6 ]   |           ^ notch
 |                                        |
  ----------------------------------------
            | | | | | | | | | | | | | | | |
```

- Insert the EPROM set in one of the 6 banks (labelled 0, 1, 4, 5, 6, 7) on 2 free adjacent sockets respectively for the H and L parts.
  Press the EPROM very gently into their socket, take care not to blend the pins!
  Make sure to install the H and L parts in their respective sockets!
  Make sure to orient the EPROM notch according to the PCB mark! On above schematic, the notch is on the left side of the sockets.
- **Jumper settings**: the Emu41 EPROM set uses the default configuration, however it is recommended to check the jumper settings:
  - if you are using bank 0 or bank 1, check the XW1 jumper is in A position,
  - if you are using one of the banks 4 to 7, check all XW2 to XW6 jumpers are in A position.
- After installation of the Software Drawer back in the Portable Plus, you will have to press the contrast key to wake up the Portable.

Software installation

Emu41p is PAM compliant, and will appear in the PAM menu.
Before running Emu41p for the first time, or after the drive A: is formated, a short installation is needed: Emu41p needs a emu41 directory on A: drive, and a emu41.ini file in it. If either is missing, Emu41p will display an error message.
A batch file is provided to do it, just do:
- from PAM menu, start the DOS Command Line,
- type "emu41ins"
That's all, you can then go back to PAM.
FYI, the emu41ins.bat file just creates the emu41 directory and copies the default emu41.ini file:

```
a:
md \emu41
cd \emu41
copy b:\emu41\emu41.ini
```

Use with an external HP41:

An external HP41 can access the internal "virtual" HPIL devices (DISPLAY, HDRIVE1, DOSLINK, SERIAL1) from the HPIL port.
It is recommended to set the option "Power Save Mode" to off in the System Configuration menu. Otherwise, the HPIL communication will be quite slow, because the Portable Plus has to wake up at each HPIL frame, then returns to sleep. Setting Power Save Mode off sligthly increases the power consumption, so use it only when a HP41 is connected.

Emu41p vs Emu41 operations

Some functions of Emu41p for the Portable Plus are slightly different from Emu41 for PC.
Some Emu41 features are not included in Emu41p due to memory space limitation:
- HPIL devices: Emu41p only includes: DISPLAY, HDRIVE1, DOSLINK and SERIAL1. XIL is supported for external HPIL communication. HDRIVE2, FDRIVE1, LPRTER1 and SERIAL2 are not supported.
- The Emu41p monitor doesn't support ROM entry symbolic labels, some monitor functions are not supported, there is no inline help, and some advanced disassembler functions are not available.
- there is no fast/slow speeds, Emu41p always runs at full speed, which is similar to a slightly accelerated HP41.
- the TAB key is used to change the printer mode (OFF/MAN/NOR/TRA), when using the HP82143 Printer ROM (PRTER1E.BIN file).

Serial port operation

The serial port is declared as
```
SERIAL1
```
in the emu41.ini file.

Emu41p uses the default serial setting, as configured in the Datacom configuration menu. Check it before trying to transfer data through the serial port under Emu41p control.
Contrary to Emu41 for PC, the Portable Plus serial port uses I/O buffers, and is much more safe and reliable than the standard PC BIOS routines.
Note that the Portable Plus serial port pinout is not standard (see below).

Content of the Emu41 EPROM set

```
Volume in drive B has no label
 Directory of  B:\emu41

.               <DIR>      27-03-06  19h04
..              <DIR>      27-03-06  19h04
EMU41P   EXE    52692  27-03-06  16h14
EMU41    INI      420  27-03-06  16h44
PAM      MNU       18  27-03-06  19h16
EMU41INS BAT       51   4-11-05  16h44
ROM41CX  BIN    15360   1-02-97  12h48
CXFCN    BIN     5120   1-02-97  12h49
CXTIME   BIN    10240  13-03-97  18h06
PRTER1E  BIN     5120  29-12-97  19h05
PRTER2E  BIN     5120  17-07-97  22h34
HPIL1H   BIN     5120  17-07-97  22h34
XIO1A    BIN     5120  15-02-97   9h18
CCD_OSX  BIN     5120  21-11-04  18h13
ADV41B   BIN    15360  16-02-98  22h50
TERM71   COM      628   1-01-86  12h14
        16 File(s)   2359296 bytes free
```

Note: the Term71 utility is provided as a free bonus. If you launched it by mistake, press the 'Halt' key to exit.Visit http://membres.lycos.fr/jeffcalc/hpplus.html for more details.

Default Emu41.ini file

```
; emu41.ini init file
[MODULES]
; page(0-15) size(Kword) file
; *** built-in system ***
0 12 b:\emu41\rom41cx.bin
3  4 b:\emu41\cxfcn.bin
5  8 b:\emu41\cxtime.bin
; --- system extension ---
6  4 b:\emu41\prter1e.bin
7  4 b:\emu41\hpil1h.bin
; --- "plug-in" modules ---
8  4 b:\emu41\xio1a.bin
9  4 b:\emu41\ccd_osx.bin
10 12 b:\emu41\adv41b.bin
```

```
[DEVICES]
DISPLAY
HDRIVE1
DOSLINK
SERIAL1
XIL
```

Note that the default emu41.ini uses the prter1e.bin file (HP82143 printer emulation).
You can change it to prter2e.bin file (HPIL printer emulation).

Adding modules

You can add modules by editing the emu41.ini file.
There are two ways to load new modules:
-   add a ROM image file in the a:\emu41 directory and declare it in the [modules] section of emu41.ini (absolute path or relative path to A:\emu41 can be used), This means that you have to edit emu41.ini each time you want to change the module configuration,
-   use the MLDL RAM support of emu41 to load ROM images from the emu41 environment. To do that, add the line:

        14 8 mldlram.dat

    in the [modules] section of emu41.ini, then use the CCD-OSX GETROM function to load ROM images into page 14 and/or 15 from a mass storage device. This mass storage can be an external device such as the HP9114 drive, or the internal HDRIVE1 (you can download a hdrive1.dat file built with the regular emu41 for PC with all the ROM images you need).

Downloading ROM images or LIF disc images from PC

Emu41p includes a built-in utility to transfer extra ROM images from PC. with X-Modem protocol. On PC with Windows, you can use HyperTerminal to download files.
From the DOS Command line on the Portable Plus, type:

    emu41p /r

Emu41p is then ready to receive a file through the serial port with X-Modem protocol.
Initiate the transfer on Hyperterminal (make sure to use regular X-Modem only!), then press any key (except ESC) on the Portable Plus to effectively start the file transfer.
The received file is named filein.dat in the current directory.

Notes:
-   the Portable Plus serial port pinout is not standard, use a suitable adapter (see below),
-   the Emu41p X-Modem utility does very little error checking (no block or checksum control).
-   Due to the limited disc space of the Portable Plus, it is recommended to use the packed 'bin' format for ROM images. If needed, use the clbin41 utility (provided with the free Emu41 PC package) to convert 'rom' format to 'bin' format, e.g.:

        CLBIN41 xio.rom xio.bin /r

-   if you don't have any convenient text editor on your Portable Plus, you can download an emu41.ini file created on PC.
-   Emu41p /r can be used to download *any* files from the PC, not only ROM images...

Memory requirement

If you are using advanced modules such as the Hepax, RAMBOX or ERAMCO RSU, you may need more memory, for instance:
- the Hepax needs 48kb main RAM and 30kb disc space for its 16kword ROM and its two 4kword pages,
- the 64k RAMBOX needs 128kb main RAM and 80kb disc space,
- the 128k RSU will need 208kb main RAM and 130kb disc space. It is not recommended for most Portable Plus configurations,

If you are using the HDRIVE1 device, it will use up to 128kb disc space, or more if you are using the mass storage functions of the Extended IL module.

Portable Plus serial port pinout

```
pin  signal
1    Data Terminal Ready
2    Transmitted Data Out
3    Received Data In
4    Request To Send
5    Clear To Send
6    Data Set Ready
7    Ground Reference
8    Received Line Signal Detect
9    Ring Detect
```

Portable Plus to PC serial cable

```
Portable Plus            PC
SUBD-9 male              SUBD-9 femelle
DTR 1 -------->--------  6 DSR
TxD 2 -------->--------  2 RxD **
RxD 3 --------<--------  3 TxD **
RTS 4 -------->--------  8 CTS
CTS 5 --------<--------  7 RTS
DSR 6 --------<-------   4 DTR
GND 7 ----------------   5 GND **
```
  ** mandatory wires. Other wires are optional, depending on application software.

J-F Garnier, March 2006.