

The HP48/49 Emulator on the HP Jornada 540 Series Handhelds

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For the past five or so years, I've toted a handheld electronic organizer in my shirt pocket. The first two were Casio models with 32 and 64K of RAM, and the third was a 1-meg Psion Sienna. Late last year when the Psion's keyboard began to give out, I thought it was time to consider one of the more popular models utilizing either the Palm or MS Windows CE operating systems. Due to the compatibility with MS Office applications, I chose a Pocket PC model, namely the 32-meg HP Jornada 548. One additional perk for choosing WinCE was that Sebastien Carlier's popular Emu48 (HP48/49 emulator for the PC) had been ported to run on a couple of the Pocket PC CPUs, and the chip in HP's model, the Hitachi SH-3, was included. After getting somewhat familiar with the Jornada, I downloaded all the Emu files I needed from Leo Bueno Castillo's site (<http://www.activex.jet.es/leobueno/emu48.htm>) plus Eric Rechlin's website (<http://www.hpcalc.org/hp49/pc/emulators>) and was up and running.

Both HP48 and HP49 are successfully emulated with this suite of files. Leo Castillo's keyboard images and keyboard-mapping-language (KML) files do an adequate job of providing access to all the keys on each machine, but the keys are extremely small and difficult to read on the Jornada's small color LCD. (See figures 1a and 1b for two of his samples.) One improvement is Chris Roper's "Jornada 49G" keyboard layout which was found at Eric Rechlin's site. This one takes advantage of just about all the available space on the Jornada display. The layout (shown in figure 2a) is fairly close to that of the HP49 keyboard. Since the emulated calculator LCD occupies a 131-by-64 matrix of the Jornada screen, there is room to the side for the "A" through "F" keys. This also allows more vertical space for keyboard rows 2 through 10.

Since the KML file enables placing keyboard keys in any display location and occupying any size, it seemed like an opportunity existed here to "improve" on the HP49 keyboard layout. Many of us RPN chauvinists prefer the HP48 key layout to the HP49. With a bit of manipulation to the image file inside a graphics editing application and corresponding updates to the KML file, a facelift was successfully performed. First, a three-way modification was done: (1) the ENTER key was moved up from the right end of the bottom row to the leftmost position of the row just above the numeric keypad; (2) the arithmetic keys were shifted downward by one row to fill the newly-vacated spot left by the ENTER key; and (3) the ENTER key was stretched double wide and the remaining keys on the same row made slightly narrower in order to fit. Next, the "J49G" logo was removed and the four cursor keys were stretched to fill out the full width available. I have gotten so used to this layout, that it has been difficult to return to the actual HP49 without making mistakes.

By the same logic, since KML is so flexible and since the HP48 keyboards that were available at the time contained keys that were too small, I considered upgrading the HP48 image file as well. This time it seemed logical that perhaps the best choice would be to use a scanned image of an actual HP48. (See figure 3a.) The image was cropped to include rows 2 through 9 below the display and display keys. An additional

improvement over the HP49 file was to center the emulated calculator display between the two columns of row-1 keys.

Since the emulator supports loading of libraries from external sources, the HP16C Emulator Library for the HP48 was successfully loaded and run from Emu48 on the Jornada. A natural companion to this was created using a scanned image of the calculator with the HP16C Emulator Library keyboard overlay in place. (See figure 3b.) Just recently, a new HP48 image file and corresponding KML file was posted by "Calculon" and is shown here in figure 4.

Lastly, I had been playing around with HrastProgrammer's HP41 Microcode Emulator for the HP49 and thought it might be interesting to port this over to the Jornada as well. It worked like a champ, however this program maps HP41 functions to HP49 keys all over the keyboard. It was felt that a KML file that would map the HP41 functions to a scanned image of the HP41 would be a great improvement. Unfortunately, due to the limitations of KML, the result (as shown in figure 5) turned out to be a less-than-perfect solution. Since the emulator was written to run on the HP49 keyboard, the HP41 ALPHA keys were mapped to HP49 letter keys. These keys are not in the same positions as in the HP41. Thus, most of the ALPHA HP41 keys turned out to either be inaccessible or in the wrong places at best. What is required (however, as far as I can determine, which KML cannot provide) is a way for a new keyboard-mapping matrix to be enabled when the shift key is pressed. Other avenues are being considered, but a busy schedule has yet to permit those to be fully researched. The fight is not over yet.



Figure 1a (left): Leo Castillo's Emu48 image file. Figure 1b (right): Leo's Emu49 image file.



Figure 2a (left): Chris Roper’s original “Jornada 49G” image file. Figure 2b (right): Modified image file with wide cursor keys, widened ENTER key and downshifted arithmetic keys.



Figure 3a (left): HP48GX image file created from scanned image of actual HP48GX calculator keyboard. Figure 3b (right): HP48 image file created from scanned image of HP48GX with HP16C Emulator Library keyboard overlay installed.



Figure 4: Recently posted HP48 image file for running Emu48 on Pocket PC handhelds.



Figure 5: Image file created from scanned image of actual HP41CX calculator keyboard attached to HP49 display, to be used with HrastProgrammer's HP41 Emulator for the HP49.