Swift 45 for Sparo / dsPics [33FJ64GP802 and 33FJ128GP802]

This document describes Swift45, the increased performance, and the slight changes. The documents about the software (SPA-R/Hydrazoic) and hardware (Sparo) should be read as well, as a basis point [www.hydrazoic.info].

Swift45.

"Swift45" is an upgrade of SPA-R/Hydrazoic. The PLL of the dsPic is activated which greatly increases performance, for a moderate increase in power consumption. The environment, operation, and language remain almost unchanged. As before, it is installed by using the supplied hex file [verify the checksum before use : 9B99 or 3F0C] and ICSP, and runs standalone or via a USB/serial link.

Performance.

A fast clock and PLL combination is used to reach just under 40 MIPS. The interpreter will now process empty loop iterations (which are not parsed) at slightly over half a million per second. Ordinary commands (which have to be parsed) run at about 25000 lines per second. Math statements require more parsing again and are slower, albeit with the trade-off that they accomplish more per line.
The next step will be to parse the lines once in a first pass and use the saved parsed lines.

Changes.

The scope of FOR loops has been increased. The count upper limit has been increased to two machine words, ie 2^{32} which means simple delay routines can be extended to practical timespans. The initial count value is left as one word.

The examples used in the prior manual have been revised slightly to use the increased loops available. The revised examples are included in the download.

The dsPic 10 uF capacitor must have a low ESR; a tantalum tag capacitor may be adequate at the lower speed but not at the increased rate. The new capacitor used was a smd tantalum with a cited ESR of 0.3 ohms. Two short solid wire leads were soldered to it and used to attach it to the board. A slightly higher ESR would probably work as well.

The increased instruction rate increases the board current draw to approx. 60-70 mA or 70-80 mA with the USB active. This increases the regulator heat dissipation, so consideration should be given to installing a small heatsink for hot environments. Ordinary power regulators and electrolytic capacitors could also be used by drilling appropriate holes in the pad areas.

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