StickOS BASIC, an MCU-resident Interactive SW Development Environment for chipKIT...

Have you ever wished you could examine and manipulate the pins and peripherals of your MCU interactively, while it was live and connected to your embedded circuit, rather than using just "reset and run" debugging? Have you every wished you could just crawl inside your MCU in action, take a peak around, tweak the code a bit, and then keep running? If so, StickOS BASIC may be for you!

With StickOS BASIC, you can log in to your MCU using nothing but a terminal emulator, and then take full control of the MCU, just as if you had an In-Circuit Emulator. StickOS can run either in "slave" mode, tethered to and controlled by a host computer as a glorified intelligent I/O port, or it can run in "master" mode, programmed in BASIC, interactively debugged, and even configured to autorun its BASIC program autonomously.

In StickOS BASIC, it is trivial to examine and manipulate I/O pins. I/O pins can be configured for digital input or output, analog input or output, servo output, or frequency output. Once a pin is configured, it can be bound to a BASIC variable, and from then on examining or manipulating the pin is as simple as examining or manipulating the bound variable. For example, to configure pin 3 for servo output, bind it to the variable "motor1", and then set it up for a 1ms (1000us) PWM pulse width is as easy as:

dim motor1 as pin 3 for servo output  
 let motor1=1000

In StickOS BASIC, it is equally trivial to use timers, UARTs, advanced I2C or SPI peripherals, as well as HD44780-compatible LCDs and simple scanned keypads.

And most importantly, it can all be done interactively -- the days of guessing what your MCU is up to are over! The StickOS debugger supports command-line program interruption, breakpoints, assertions, watchpoints, live variable (and pin) manipulation and examination, execution tracing and single-stepping, sampling profiling, and even edit-and-continue!

When you're ready to move up, you can then port your BASIC program to C using the MPLAB X StickOS Skeleton project, and take advantage of all the same pin/peripheral configuration, flash manipulation, etc., used by StickOS BASIC.

More information and downloads for the chipKIT boards are available here: http://www.cpustick.com/downloads.htm

The StickOS BASIC Quick Reference overview guide is here: http://www.cpustick.com/downloads/quickref.v1.82.pdf

And the full online StickOS BASIC User's Guide is here: http://www.cpustick.com/stickos.htm

For an older video introduction, start with part 1 here: http://www.youtube.com/watch?v=nSgha8qjB3E  
Then part 2: http://www.youtube.com/watch?v=UOhN\_rzwi80  
Then part 3: http://www.youtube.com/watch?v=XLat-YqMUV4

Have fun!

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