FW01-NAP: Routine For Extended Sleep Delays

Description

NAP is a routine we wrote to sleep the PIC for an extended period of time to conserve battery life.

What's Included

NAP.INC	The sleeping routine
NAP_DEMO.ASM	Demo program
WAIT.INC	1mS delay routine
P16F84.INC	PIC16F84 definitions
NAP_DEMO.HEX	Assembled demo program
NAP.PDF	This file
31026A.PDF	Microchip paper on WDT and SLEEP

Operation/Usage

NAP uses the watchdog timer (WDT) to wake up the PIC from a SLEEP command. The duration of these little pauses is dependent on the postscaler value assigned to the WDT. The default WDT timeout is 18mS; this can be extended to a maximum value of approx. 2.3 seconds with a postscaler value of 1:128 (18mS x 128 = 2.3S).

To extend this to a useful sleep delay, we have a defined a 16 bit counter NAPHI:NAPLO which is decremented each time the WDT wakes up the PIC. If NAPHI:NAPLO = zero then the MAIN loop is executed; if not zero then the PIC is just put back to sleep.

To set the duration of the extended sleep, the user sets the value of NAPHI:NAPLO in **NAP.INC**. This number times the WDT timeout period (set by WDT postscaler) defines the total time spent asleep. You can see that a very long sleep delay can be defined in this manner.

NAP is invoked by: **GOTO NAP**

Testing

NAP_DEMO.ASM is a program that demonstrates the NAP routine. It switches on RB0 for 250mS (delay set by **WAIT.INC** routine), back off, then branches to **NAP.INC** where a 5 count sleep duration is setup in NAPHI:NAPLO defining an approx.11.5S extended sleep (2.3S x 5 = 11.5S). MAIN repeats thereafter.

A Rapid18 PCB was used to test this program. RB0 was attached to BUZZ to activate the buzzer on the board when RB0 was high. A PIC16F84 was programmed with **NAP_DEMO.HEX** and installed on the PCB.

When power was applied to the PCB the buzzer approximately every 15S. Not the 11.5S we had predicted, but close. Note that the WDT RC oscillator is temperature sensitive and timing calculations will be approximate--a bit of experimentation may be in order to get the precise sleep delay you desire.

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