



Electromechanical Timer Replacements

Maxi Functions, Micro Chip

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This circuit allows fodder for several discussions, including efficient methods of using pins. A simple way to sense buttons with fewer pins than the classic cross-grid array does is one obvious derivative (5-lines for 8 push button, etc.). It also emphasizes the current driving capabilities of the Microchip family of parts in a fun environment.

DESCRIPTION

The application contains the kernel for several clever approaches for maximizing the use of the 8-pin family (even more can be done with A/D parts). It uses two 7-segment LED digits, a piezo noise maker and two push button to construct a simple game timer, and can be built with a minimum of components (could even be used like an alarm). This application shows how to drive 14 segments, a speaker and two push button with this 8-pin low-cost part.

To simplify understanding of the schematic, the displays are common anode type, and must have the driven cathode pulled low before the anode pin is pulled high to light any segment. The speaker is driven with all other pins low, and sleep is with all outputs low. The circuit is designed for 3 volts, and either push button should wake it from sleep.

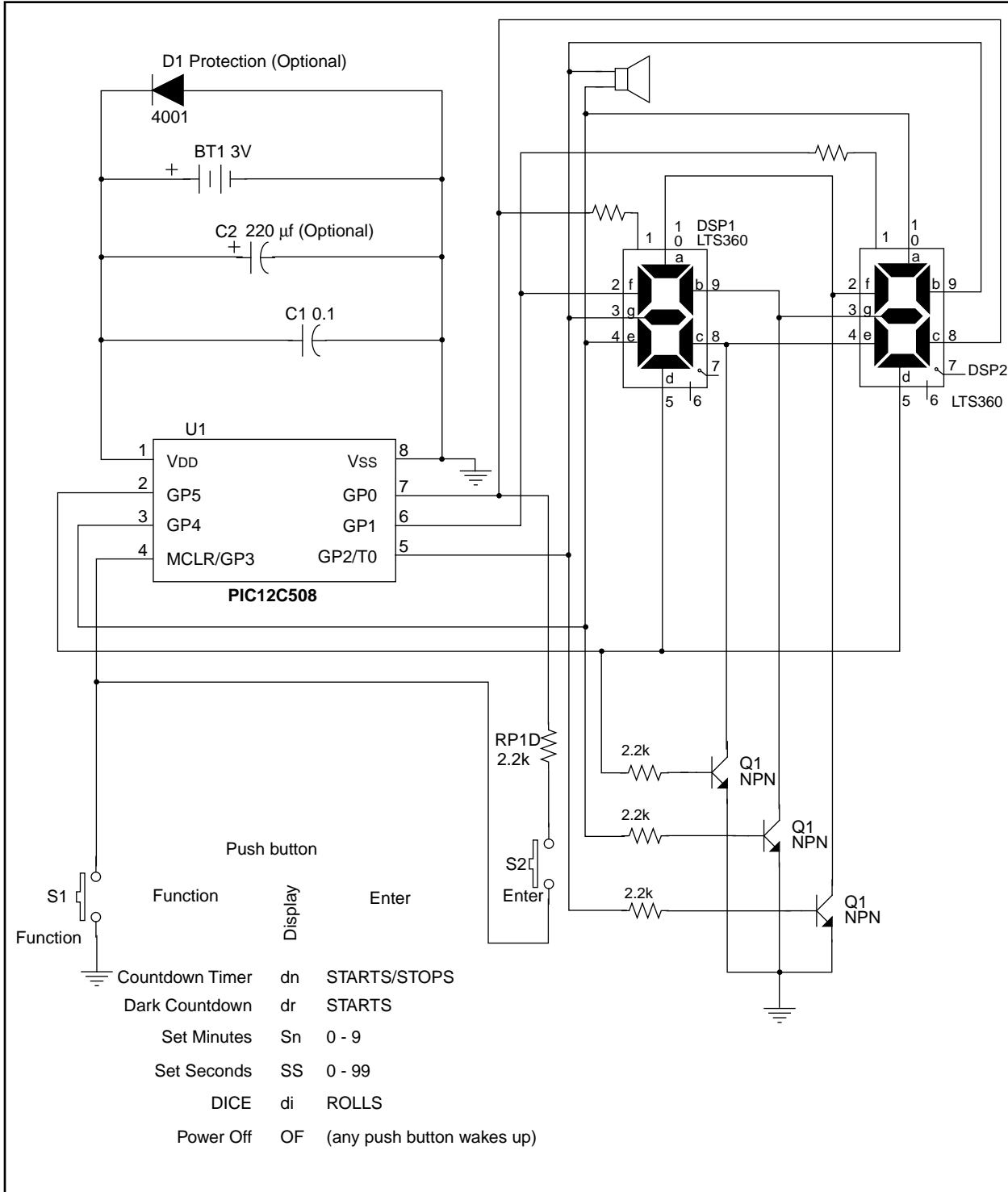
The functions mentioned on the schematic include a countdown timer, where the second button can start or stop the countdown, and a dark countdown timer, where the second button only starts the timer, with no visual hint as to when the time will run out (adds spice to some games). The minutes and seconds can be set and will be remembered between uses, until new values are entered. 9 minutes was selected as the maximum on that range because of the game nature of the circuit, and the less than perfect accuracy of the internal clock. 99 seconds was selected as a maximum on the set seconds function to maximize the functionality, so over 10 and a half minutes maximum is available. The dice mode is added for utility, and rolls new numbers every time the second button is pressed, (after a few beeps from the speaker) with first one digit popping up and then the other. The system goes to sleep after a bit of non-use and wakes up in the same place on any push. The OFF mode (OF) forces the unit to sleep with any button waking up and the unit starting at the top of the list.



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FIGURE 1: PIC12C508 GAME TIMER SCHEMATIC



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NOTES:



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