# DSP-93 Watchdog Timer

The DSP-93 lacks a hardware watchdog timer that will reset the hardware if the PTT lines get stuck on due to the processor getting lost. This could happen during brownout situations, RF leaking into the DSP-93, or software bugs that leave the PTT lines active. The watchdog timer was designed so that if either PTT1 or PTT2 get stuck in the active state for over about a minute, the DSP-93 box will be reset.

Features:

- Simple one chip timer circuit.
- Can easily be built using perfboard or with single sided PCB.
- Looks at jumper settings to automatically select active high or low PTT's.

## Construction

The circuit can be built on a small perfboard or a single sided PCB could be made. The only critical part is the HC86 quad XOR gate. A CMOS part must be used in order to get the correct time-out value.(An LS or other bipolar chip will not work correctly)

## Installation

The watchdog timer can be mounted anywhere inside the DSP-93 box. I used hotglue and stuck it on the top of the 40 pin UART chip. Those more mechanically inclined could drill some holes and mount it more securely to the case. The +5 and GND can be obtained from the test points on the board. The signal wires can be tack soldered directly to the IC pins if one is careful not to get over zealous with the soldering iron.

## Testing

There's no real simple way to test the circuit once it is installed without modifying one of the DSP-93 programs to force the PTT lines active continuously and see if the box resets after a minute or so. One way would be to test the board out of the DSP-93 by tying connector P1 pins 3 and 5 HIGH and 4 and 6 LOW. Monitor the voltage on pin 11 of U1. After about a minute it should go HIGH. Monitoring the voltage across C1 should show it rise from 0 to about 2.5 volts where the U1 output should transition to HIGH and then the voltage across C1 will continue on to +5 volts.

## Known Problems

- This circuit is not able to directly reset the hardware latches that control the PTT lines. It requires the DSP chip to be reset and it will initialize the PTT lines from the monitor program. This is all well and good unless the processor itself has problems and won't be able to reset the PTT's.

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