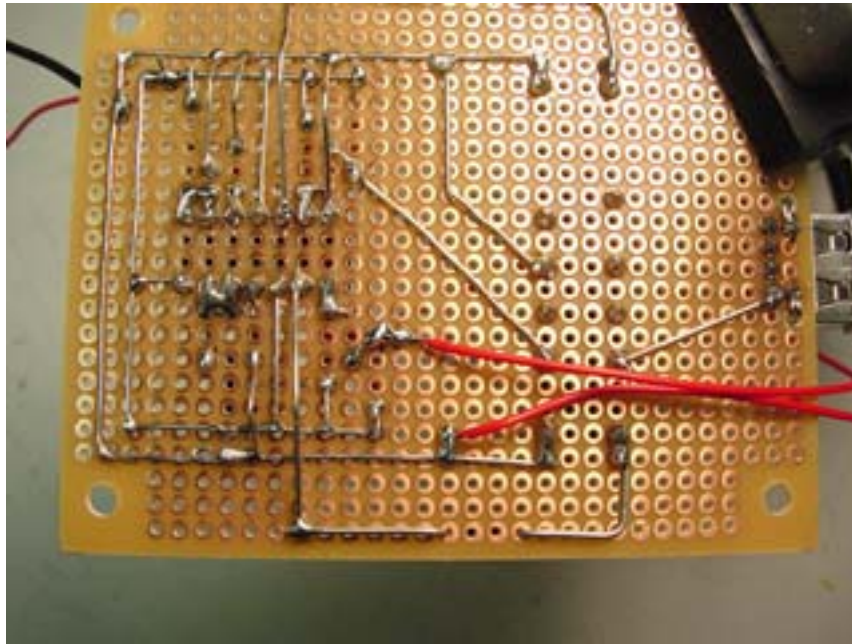


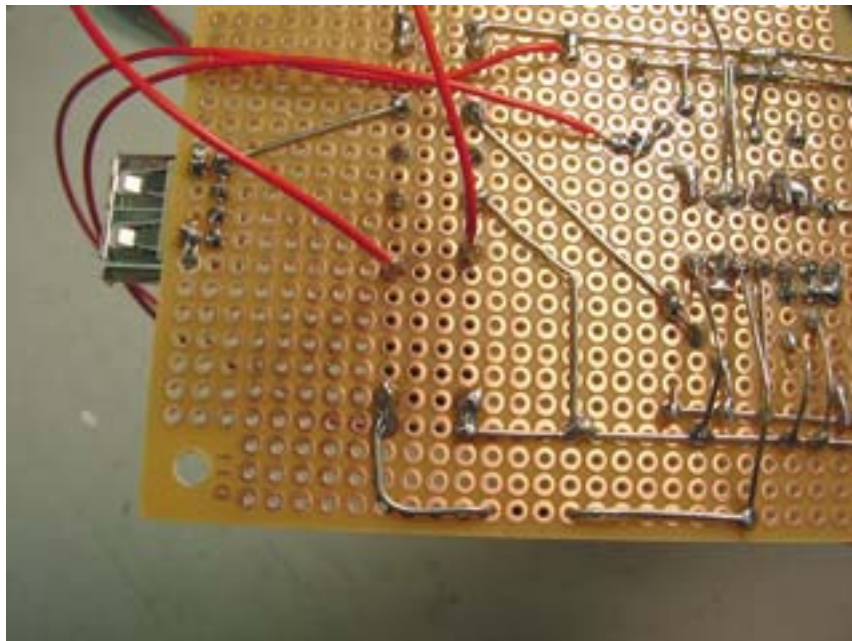
MP3 Player Timer Board Assembly – Part 3

As always, read this entire instruction before starting.

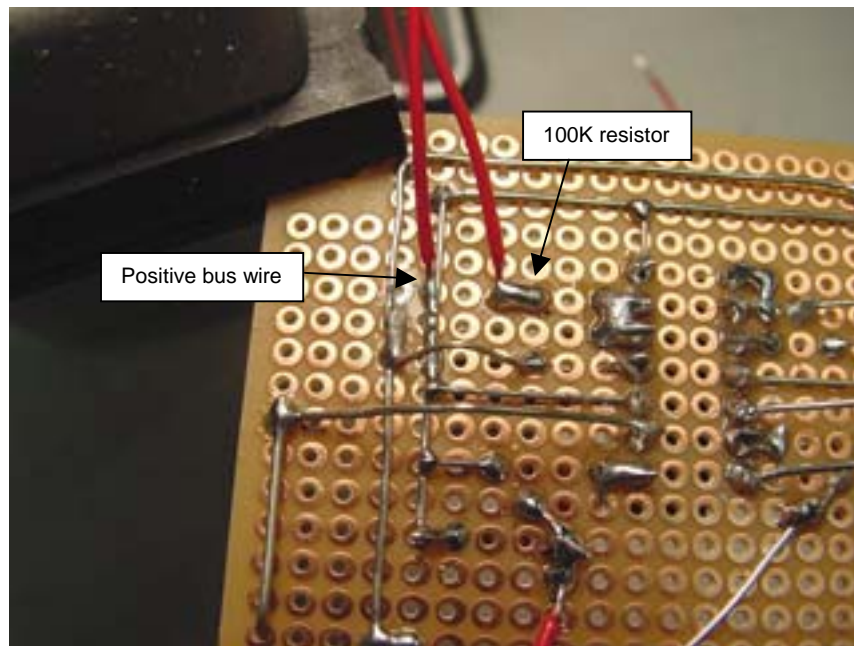
1. Now for the easy stuff. Locate the trigger point as shown, and solder a wire in the hole next to it. Make a solder bridge to the wire. Solder another wire to a point on the negative bus wire. When these two wires are shorted, the timers will activate. Make the wires about 10" long – you can trim them later if needed.



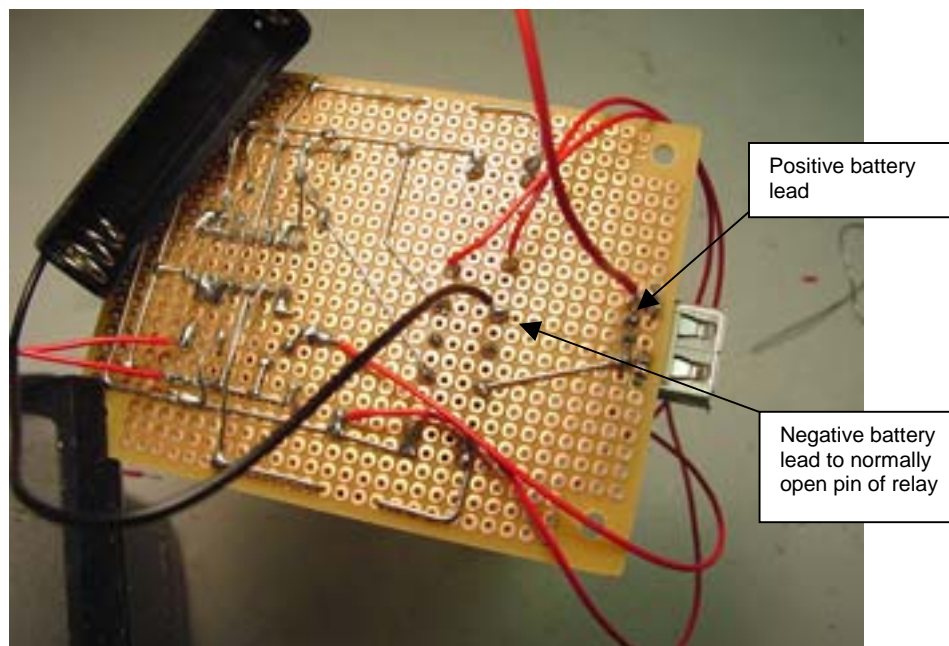
2. Solder two wires to the SPST relay as shown. These wires will connect to the MP3 player switch wires. Make them about 6"-8".



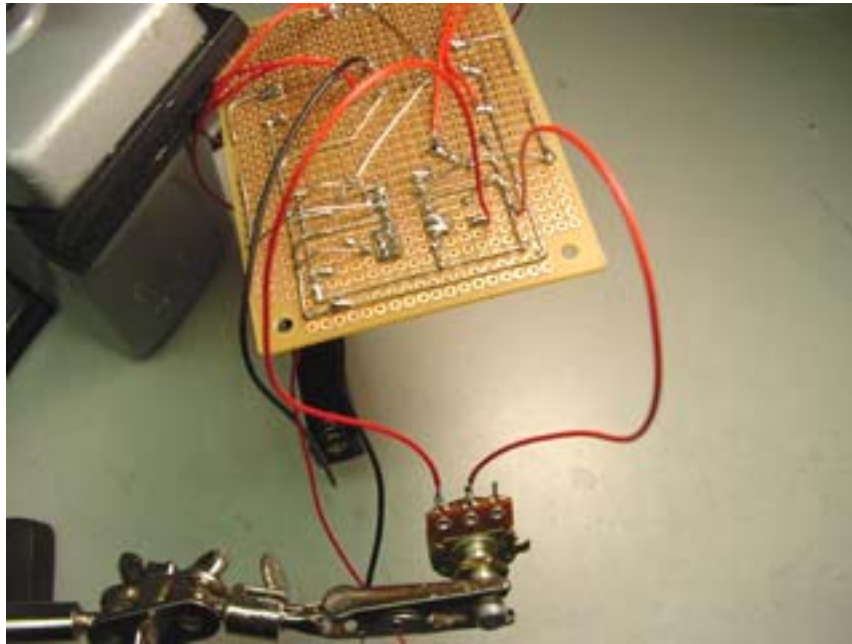
3. Solder two 6" wires as shown. These will connect to the 1Mohm potentiometer. The 100K resistor (pin 13) is the one that's next to the large 220 uF cap.



4. Solder the AAA battery holder to the remaining normally open pin on the DPDT relay and the pin shown on the USB connector. Note: If you plan to place this circuit in a project box, you may want to wait until the box is ready and the wire holes are drilled before making this connection.



5. Solder the wires from the 100K resistor and the positive bus wire to the potentiometer. One wire must go to the center pin.



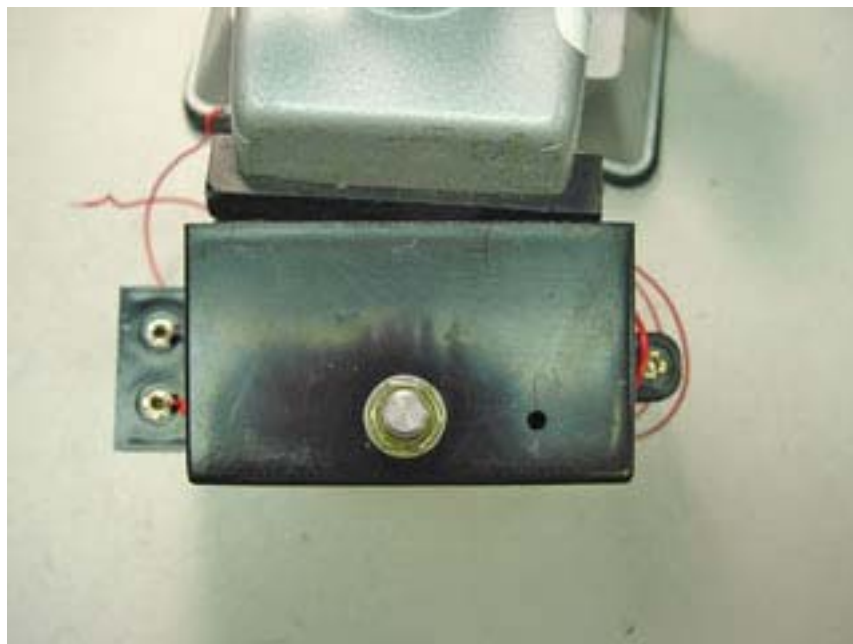
Note: At this time I recommend testing the board. Attach a 9 volt source to the power leads. **Make sure you have the polarity correct or you'll kill the 556 chip.** Insert a AAA battery and plug in the player. Connect the player switch wires as shown in Step 11. Touch the two trigger wires together while watching the player. The red light should come on and then start blinking. If it doesn't, press and hold the Play button on the player. If the player is working right, the light will come on and blink when you release the button. I also recommend testing ALL of the MP3 players you have with all the boards you build. There may be some variation in the time required to put them in Play mode.

If the player is working but doesn't light up when triggered by the timer, you'll need to increase the relay "on" time a bit. Email me at adamsgd@aol.com and we'll discuss what to do. Don't worry – it's easy.

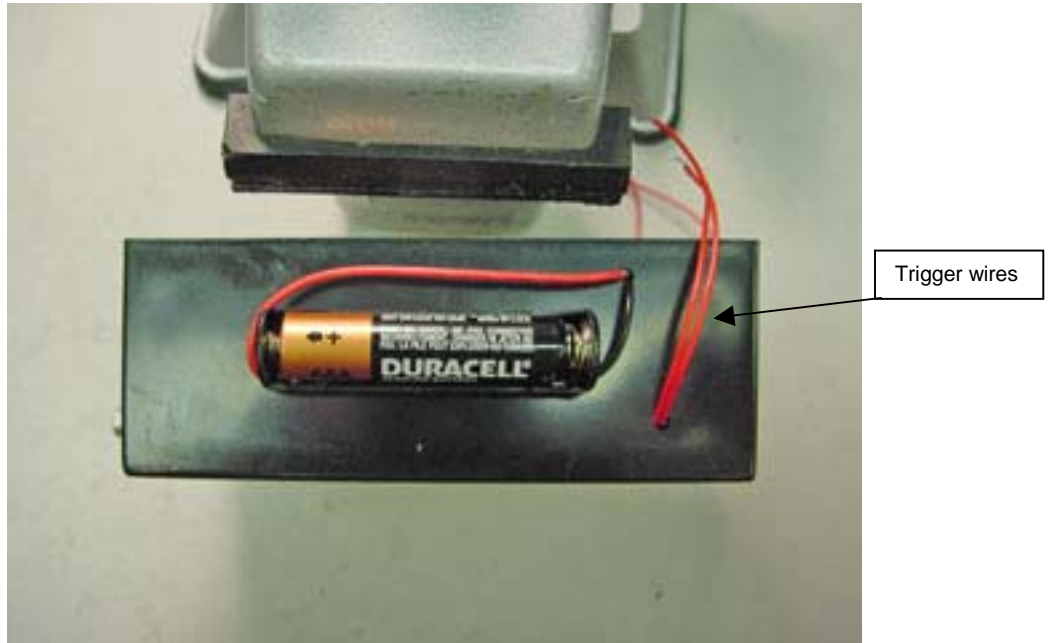
6. That's all the wiring. Here are some pix of how I installed the board into a TB-3 project box from All Electronics. The box is matched to fit the PC-3 perf board. Drill holes in the appropriate places to run the wires out. Do the drilling before you place the board in the box. I used foam tape to attach the 9 volt battery holder to the box.



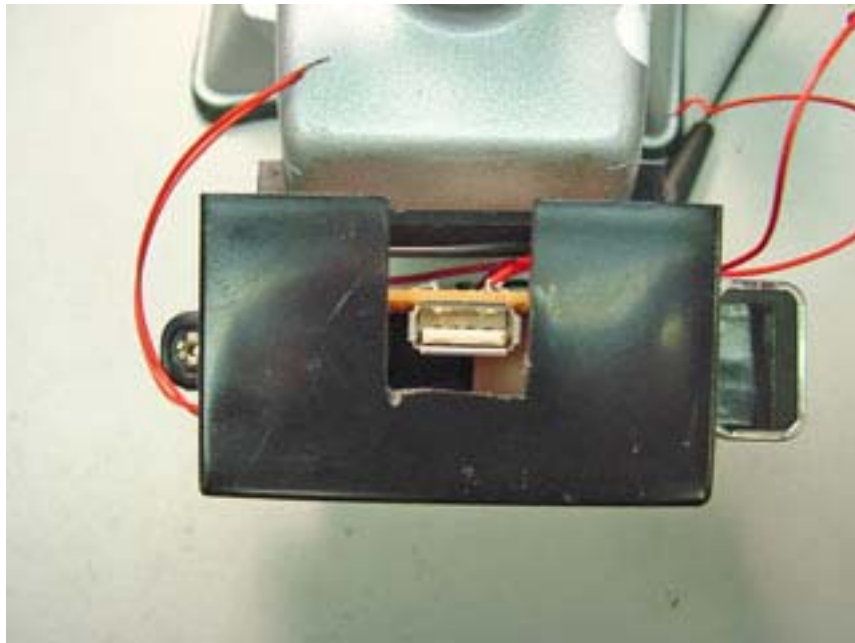
7. Drill a hole that fits the shaft of the potentiometer. Make sure you leave enough clearance for the pot to fit in the box. Attach the nut and tighten.



8. Again, I used foam tape to attach the AAA battery holder to the box. Solder the battery leads as shown in Step 4.



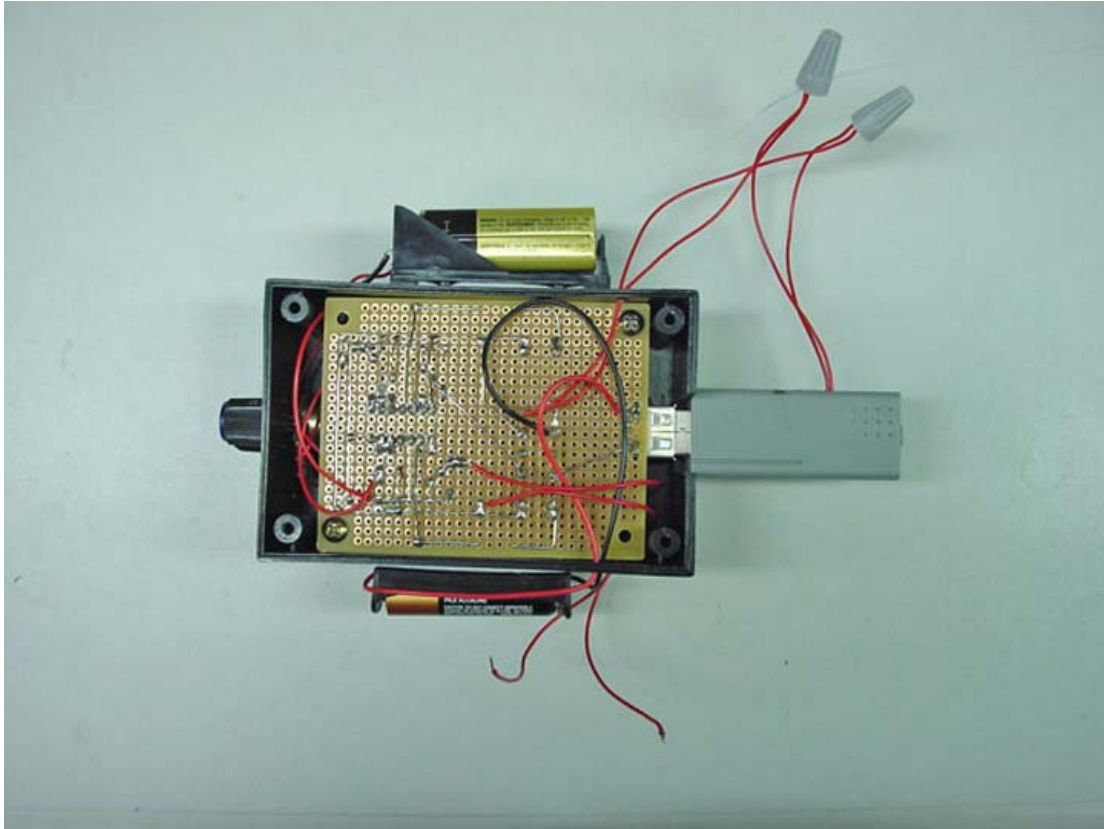
9. I hacked a slot in the box opposite the potentiometer. Again, do this before you install the board.



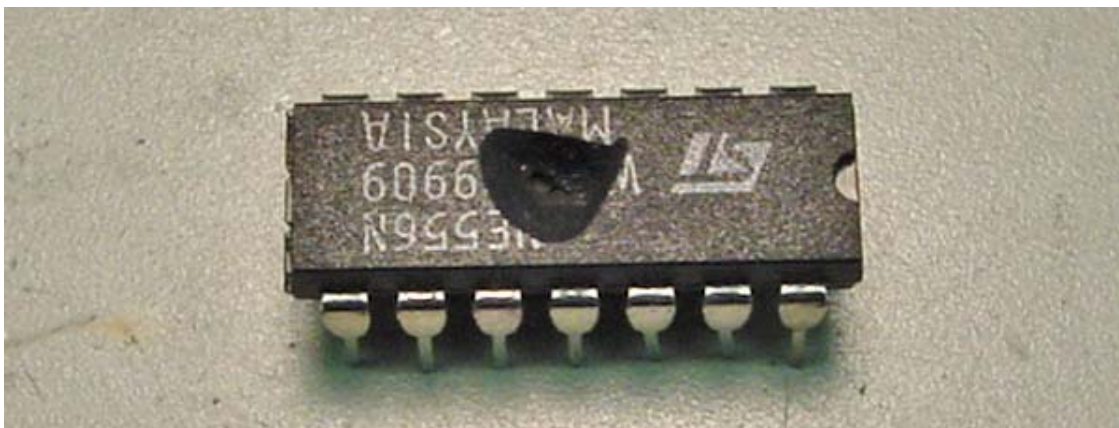
10. Here's where I soldered the player trigger wires. Make sure you don't get any solder on the other components or terminals. File a notch in the cover to let the wires out.



11. Here's the finished product. I found a knob that fit the pot lying around on my bench. It's helpful to have an indicator when dialing the time settings. Plug in the player and batteries, connect the wires as shown, and see what happens when you trigger the circuit.



Caution: When installing the 9 volt battery, do not reverse the polarity, not even for an instant. This circuit is not fused, and reverse polarity will blow a crater (literally) in the 556 timer IC. I know I'm repeating myself, but the chip will explode. See for yourself:



What you should see is that the red indicator on the player will light, and then start blinking.

This means the player is in "Play" mode. It will stay on for ~24 secs, then the power will be cut and the light will go off. If the light hasn't gone out after 30 secs, turn the pot shaft all the way in the opposite direction and wait about 30 secs. The light should go off now. If it doesn't, or you are getting other odd behavior, drop me a note at adamsgd@aol.com. Include pictures of the board and the way you wired up the batteries etc. If all is well, congratulations! Have fun with your new toy!

Note: Some players may not trigger into the "Play" mode before the 1.5 sec timer runs out. There is some variation among the players as well as the components in the circuit. If this happens, let me know and I'll show you how to increase the time so the player will start.

The time limits for the "on" time are set by the resistor/capacitor values at pins 12 and 13. The 220 uF cap gives you a minimum on time of ~24 secs and a max of ~4:30. Changing the value of the cap will change these times. I did a test with a 470 uF cap at pin 12 and couldn't get the timer to reset – it kept re-triggering itself. If 4:30 is too short a time for your needs you may be able to use a 330 uF cap, but the timer may re-trigger. Having a minimum time of ~24 secs means that you'll need to edit the sound file(s) if they're shorter than that, or the player will loop. Just add silence to the end of the file to increase the length to greater than the minimum play time and you're good to go.

Troubleshooting:

Since I don't know how skilled you are in circuit assembly and soldering, it's hard to cover all the things that might go wrong. If the circuit doesn't work, here are a few things to check:

1. Bad solder joints – check all of the solder joints on the board, preferably under magnification. Look for solder bridges and traces in places where they don't belong. "Cold" joints will appear dull in color (not shiny). Reflow any suspect joints.
2. Capacitors installed backwards – there are only two caps that require correct polarity, the one on pin 2 and the large one on pin 12. Check both of them against the pics in the how-to and make sure they're correct. If they're reversed, they may eventually explode. That's not good, not even a little bit good.
3. Last but not least – double-check all the components to make sure they're in the right place, that all wiring is as shown in the how-to, and that the IC is in the socket correctly (the dot on the IC should be at pin 1).