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ELECTRONICS

**FORREST M. MIMS III: ATARI PUNK CONSOLE KIT | JAMECO PART NO. 2155487**



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**Experience Level: Beginner-Intermediate | Time Required: 30 minutes - 1 hour**

The Atari Punk Console has become the popular name for a simple circuit that Forrest first described as a "Sound Synthesizer" in Engineer's Notebook: Integrated Circuit Applications (1980) and then a "Stepped Tone Generator" in Engineer's Mini-Notebook: 555 Circuits (1984).

### **How It Works**

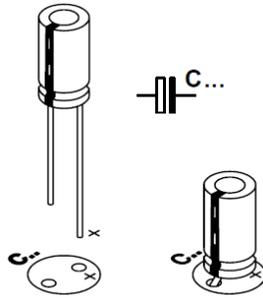
The circuit consists of a 556 dual-timer IC (equivalent to a pair of 555 timers) and half a dozen other parts. In operation, the first timer is connected as an audio frequency oscillator and the second as a monostable multivibrator. The oscillator drives the monostable, which emits square output pulses with a duration controlled by R3. You have to hear the end result to fully appreciate the stepped tones that are generated as R1 and/or R3 are adjusted.

R1 controls the frequency of the audio oscillator. R2 controls the output pulse duration of the monostable multivibrator. R4 is an optional volume control that can be deleted by connecting the speaker directly to C3.

### **Assembly Instructions**

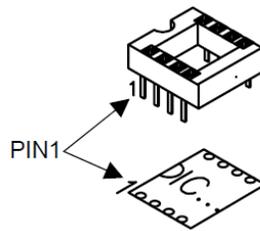
Place and solder each component corresponding to their respective spots on the PCB. Here are some tips on how to distinguish which parts are which:

- 1) The capacitance values for C1 and C2 can be measured using a multimeter. Otherwise, looking at the capacitor, C1 is marked with "103", where C2 is marked with "0.1"
- 2) C3 is the electrolytic capacitor with the cylindrical shape. This capacitor is polarized so find the negative side with the black stripe and place it accordingly on the board. (Figure 1)



**Figure 1: Electrolytic Capacitor Polarity**

- 3) R2 is the resistor with the color code: Brown, Black, Red. This comes in a package of ten, but you will only need one. Keep the rest for future use.
- 4) Each potentiometer is marked with the values "5k" for R4, or "1M" for R1 and R3. Although these potentiometers have their own spots on the board, you will be mounting them on the enclosure, so solder a piece of hookup wire from the pad to the potentiometer, making sure there is enough length wire between the board and your mounting area.
- 5) The toggle switch S1 has 2 pins which should be inserted into the board through the center pad and the square pad. Do not place the switch through the pad without a trace.
- 6) The battery snap has two leads, each colored red or black. Solder the red lead to the positive pad, and the black lead to the negative pad.
- 7) Solder the IC socket with the correct orientation onto the board. Keep note of the notch on one end, (Figure 2). Insert the IC into the IC socket staying consistent with the notch.



**Figure 2: IC and IC Socket Orientation**

- 8) You now have all your components sorted out, and it's time to find your ideal mounting locations on the enclosure. Be sure to leave enough wire to comfortably reach each mounting location. Make holes for the toggle switch S1, three potentiometers R1, R3, and R4, as well as the PCB and the speaker, if desired. Refer to their respective datasheets for mounting hole sizes.
- 9) Use the mounting hardware kit to mount the PCB and speaker. The potentiometers and toggle switch already have nuts and washers attached.
- 10) After tightening all the screws and nuts, place the rubber feet on the bottom of the enclosure on each corner. This will keep the enclosure from moving around and wobbling.

### Testing the Circuit

Before making finishing touches and placing the lid on the enclosure, turn on the switch and make sure the circuit works. R1 and R3 control the frequency and duration of the pulses, where R4 acts as volume control. When the speaker is emitting a tone, you're ready to experiment.

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