

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.

Required Tools and Parts:

- Soldering iron / Solder
- Drill and drill bits

Kit Includes:

Part No.	Qty.	Description
904114	1	IC, LM556N, DIP-14 (dual timer) (U1)
37197	1	14-pin IC socket (U1)
690865	10	Resistor, 1/4W, 1k Ω (R2)
255514	1	Potentiometer, 1/2W, 5k Ω (R4)

255582	2	Potentiometer, 1/2W, 1M Ω (R1, R3)
15229	10	Ceramic disc capacitor, 0.1 μ F, 50V (C1)
33486	1	Tantalum capacitor, 0.1 μ F, 35V (C2)
29891	10	Radial capacitor, 10 μ F, 50V (C3)
2329679	1	Speaker, 1.9"D, 8 Ω , 0.4W, 500-6KHz (SPKR)
265077	3	Knob, 1/4" shaft, 13mm, Blue
18893	1	Plastic ABS enclosure, 6" x 3.5" x 1.9"
2112461	1	9V battery
11280	1	Battery snaps for 9V battery, 3" leads (BT1)
2191891	1	9V batter holder clip
106551	1	Mounting hardware kit
76523	1	Toggle switch, SPST, ON-OFF (S1)
126981	1	Adhesive black rubber feet
134341	3	1' stranded 22AWG wire
2152003	1	Custom Atari Punk PCB

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 capacitors can be measured using a multimeter. Otherwise, looking at the capacitor, C1 should be marked with "103", C2 should be marked with "0.1", and C3 should be marked "10 μ F".
- 2) C2 is the tantalum capacitor and C3 is the electrolytic capacitor with the cylindrical shape. These capacitors are polarized, so find the negative side (C3; shown as a "-" stripe down one side) and place it accordingly on the board. C2 is also polarized and should have a "+" marking near one side to show which lead is positive. (Figure 1)

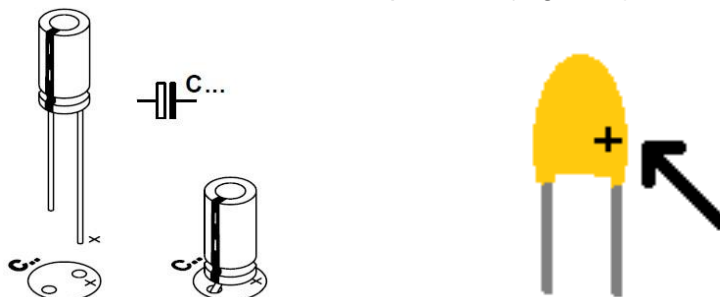


Figure 1: Determining Capacitor Polarity

- 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 two pins and should be inserted into the board through the center pad and the square pad. You may want to have the switch mounted to your enclosure, so you will need to solder some wires to the center and right-most pads of S1 and run them to the switch when you have found a suitable mounting location. Do not place the switch through the pad without a trace. (It should be the center pad and pad closer to R3 on the PCB.)

- 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 of the socket, (Figure 2). You will see a corresponding notch on the PCB right near "U1". Then insert the IC into the IC socket, again matching the notch on the IC with the notch on the socket and PCB.

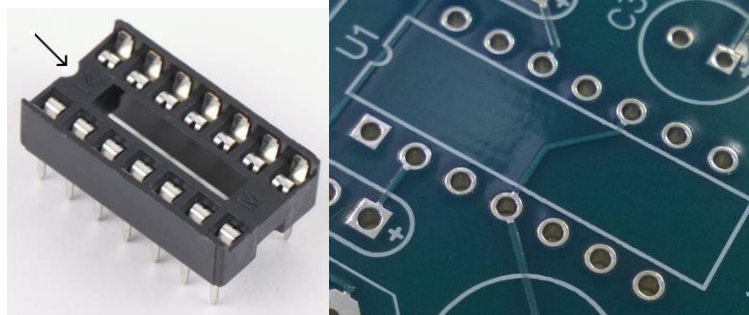


Figure 2: IC and IC Socket Orientation

- 8) You now have all your components sorted out, and it's time to choose 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. (Pot mounting holes should be approximately 0.315", and the switch mounting hole should be approximately 0.245"; Refer to their respective datasheets to confirm 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 to hold them secure to the enclosure.
- 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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