Atari Punk Console

THE NE556 STEPPED TONE GENERATOR, ON A BREADBOARD // BREADBOARD BUILD SHEET // MESS O' PEDALS

Build Forrest Mims' stepped tone generator - the Atari Punk Console - on a breadboard in about twenty minutes. Row-by-row recipe, pinout, troubleshooting table, and an optional photoresistor mod that puts it under light control.

Parts

☐	1x NE556 dual timer, 14-pin DIP - spot it: NE556 printed on top; a notch marks pin 1
☐	1x 1M pot - knob one, how often the pulses come. Spot it: marked B1M (B = linear taper)
☐	1x 500K pot - knob two, how long each pulse lasts. Spot it: marked B500K (or B504)
☐	1x 100K pot - volume. Spot it: marked B100K
☐	1x 1K resistor - spot it: bands brown-black-red, or meter it
☐	2x 10nF ceramic - one timing cap per timer. Spot it: printed 103
☐	1x 10 uF electrolytic - output coupling. Spot it: a little can; the stripe marks the minus leg , longer leg is +
☐	7x jumper wire
☐	Breadboard, 9V supply, output jack
☐	For the optional light mod: 1x LDR (photoresistor, GL5528 or similar - the little disc with the wavy trace) and 1x more 1K resistor

Before you start

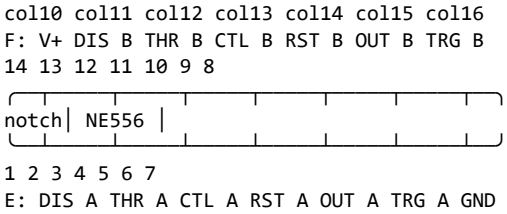
Almost no soldering - the breadboard does the holding. The one exception: each of the three pots gets a small solder bridge on its lugs before it's wired in (the steps say exactly where). Three joints total, then the iron goes away.

Mind polarity on the 10 uF electrolytic - the stripe marks the minus leg - and on your power leads. Backwards electrolytics bulge or pop.

If the chip ever gets hot, power off immediately. That means the + rail is shorted to the - rail somewhere. Nothing in this build should even get warm.

If you power it from a salvaged lithium pack, the usual cell cautions apply - see Do You Want to Survive the Vapocalypse?

The chip, from above



Timer A on the left, timer B on the right. Notch marks pin 1, and pin 1 goes in E10 - then every pin lands on the hole shown. No mirroring, no mental flipping.

Build

Steps 1-8 The chip and its jumpers

Pin 1 goes in E10 - put the chip anywhere else and every row below shifts with it. Then all seven jumpers in one pass: two for power, two holding the reset pins high, and three that wire the two halves of the 556 to each other.

Steps 2-3 are the chip's power. Steps 4-5 hold both reset pins high - leave these out and the chip stays switched off. It's the most common miss in the whole build.

STEP	DO

	1	Seat the NE556 across the center channel, notch to the left: pin 1 in E10 , pin 7 in E16, pin 8 in F16, pin 14 in F10
	2	Jumper: J10 to the top + rail
	3	Jumper: A16 to the - rail
	4	Jumper: A13 to the + rail
	5	Jumper: J14 to the top + rail
	6	Jumper: C11 to C15
	7	Jumper: H12 to H11
	8	Jumper: D14 to G16

Steps 9-12 The resistor and the capacitors

One resistor, two timing caps and the output electrolytic. The two 10nF caps are what set the range the knobs sweep through, so they are the pair to change later.

	STEP	DO
	9	Resistor 1K : B10 to B15
	10	Cap 10nF : D15 to the - rail
	11	Cap 10nF : G12 to the top - rail
	12	Cap 10 uF , + leg in G15 , other leg in B22

Steps 13-23 Off the board: three pots and the jack

Nothing else goes into the breadboard. Two of the pots are wired as variable resistors, with the middle lug bridged to an outer one; the volume pot is the odd one out and uses all three lugs, which is what lets it reach silence.

	STEP	DO
	13	Take the 1M pot . Bridge its middle lug to either outer lug
	14	Wire: the 1M pot's unbridged outer lug to the + rail
	15	Wire: the 1M pot's middle lug to A10
	16	Take the 500K pot . Bridge its middle lug to either outer lug, same as before
	17	Wire: the 500K pot's unbridged outer lug to the + rail
	18	Wire: the 500K pot's middle lug to J11
	19	Take the 100K volume pot . Do not bridge this one
	20	Wire: A22 to either outer lug of the volume pot
	21	Wire: the volume pot's other outer lug to the - rail
	22	Wire: the volume pot's middle lug to the jack tip
	23	Wire: - rail to the jack sleeve

Step 24 Power up

Turn the volume pot all the way down first , then power up: 9V positive to the + rail, negative to the - rail, with both rail pairs fed - bridge + to + and - to - at the free end if your supply lands on one pair. Bring the volume up, sweep the knobs, and start hunting for the steps.

Optional Put it under light control

Swapping knob one for a photoresistor turns it into a light-played instrument - wave a hand over it and the steps chase your shadow. Do this after the basic build works , so you know any new weirdness came from the mod.

The 1K stops the pitch running away into ultrasound under bright light. Knob two still works as normal - keep it. Want two whole voices under light control? That's the Optical Theremin , the next build in this series.

	STEP	DO
☐	24	Remove the two wires to the 1M pot (steps 14 and 15)
☐	25	LDR : + rail to D4
☐	26	Resistor 1K : C4 to C10

If it doesn't work

SYMPTOM	CHECK
No sound at all	Steps 2-5. A floating reset pin holds the whole chip off, and it's the most common miss.
A steady tone that won't step	Step 8. Without it the two halves aren't talking.
Knob one does nothing	Steps 13-15, and check the bridge is actually on the middle lug.
Knob two does nothing	Steps 16-18.
Very faint output	Steps 19-22, or the electrolytic in step 12 is in backwards.
Slow clicking, no pitch	Both knobs at maximum resistance. Turn them down.
Hot chip, nothing works	Power off immediately. Something has the + rail shorted to the - rail.

Things to try

- Find the steps. Sweep knob two slowly with knob one parked. The pitch climbs, then lurches down an interval, then climbs again. Those jumps are what the circuit is named for - they happen when a new trigger arrives before the previous pulse has finished.
- Live on the edge. Park both knobs somewhere unstable and tap the breadboard. The steps flip either way.
- Bend it. E12 (low side) and F13 (up top) are the two control-voltage pins. A finger across either one bends the pitch; a wire from an LFO or another oscillator does it properly.
- Slow it down. Larger timing caps in steps 10 and 11 drop the whole thing into machine-gun and drone territory. Try 100nF (printed 104).
- Make it permanent. When the breadboard version has earned a box, the Dead-Bug Mosquito is this same circuit soldered point-to-point, with CV inputs and a clock output.