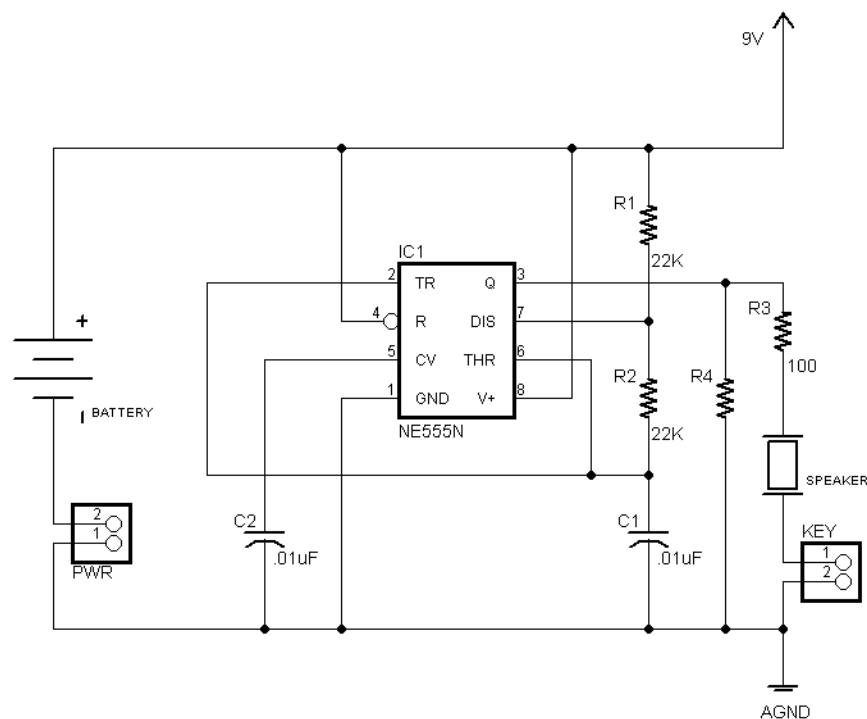


The “Dream To Design” Morse Code Oscillator

This kit is intended to be a novelty item for experimenters. Feel free to laugh hysterically at the comedy of errors, as long as you have ***FUN*** building it! Please read through these instructions prior to assembly. There are some important considerations. The construction of this circuit will result in a simple oscillator that resonates around 2200 hertz. If you wish to change this frequency, this can be accomplished by modifying the values of R1, R2, and C1. With a little background knowledge of how the 555 timer in astable multivibrator (that means it oscillates, we’re just trying to impress you) operation, any reasonable frequency can be achieved. The volume of the piezo is low, but it works. You may also wish to change out the piezo element for a small speaker at some point. If you do this, be mindful to make sure R3 is populated with a resistor and not shorted.

Schematic



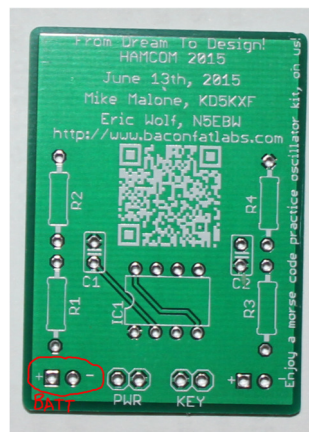
Kit contents:

- ☐ (1) Circuit Board
- ☐ (1) 555 Timer integrated circuit
- ☐ (1) Piezo Element
- ☐ (2) .01 uF capacitor
- ☐ (2) 22K ohm Resistor (Red-Red-Orange)
- ☐ (1) 100 ohm Resistor (Brown-Black-Black)
- ☐ (1) 9 volt battery snap
- ☐ (1) 2 pin header
- ☐ (1) 2 pin jumper (preinstalled on the header)

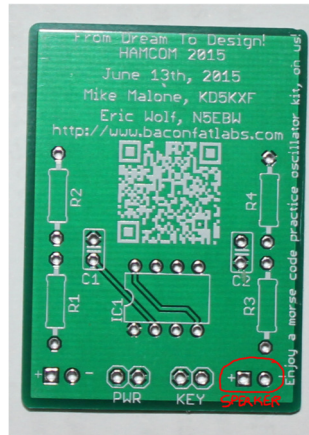
(Feel free to inspect the kit contents and check off each item to ensure completeness)

Instructions:

- ☐ Step 1 – Locate the 555 timer integrated circuit. Ensure that Pin 1 of the physical part matches Pin 1 on the circuit board by placing the labeled dot of the IC to the left of the semicircle indicator on the circuit board.
- ☐ Step 2 – Install .01 uF capacitors. The leads on the capacitors will need to be bent inward slightly to accommodate the holes on the circuit board footprint.
- ☐ Step 3 – Install 22K resistors (red-red-orange) into R1 and R2.
- ☐ Step 4 – Install 100 ohm resistor into R3. This is technically not necessary if using the piezo but it doesn't hurt to leave in. The piezo acts like a capacitor in nature and current limiting is not required. This has been included solely as a precaution for people wishing to use small speakers instead from their own source. If you DO omit this resistor in favor of just using the piezo, you must jump across the pads of R3. We can see it now... you're saying to yourself, "Why are they even telling me this? I'm just going to leave it in anyway...."
- ☐ Step 5 – Install R4. Just kidding. There is no R4 and you can leave it unpopulated, but check this box off with great accomplishment and pride anyway, you savvy circuit builder, you.
- ☐ Step 6, install the header pins into the footprint labeled PWR. Keep the jumper over the pins while you do this as it will offer a little protection as the pins heat up and also act as a jig to keep them in alignment.
- ☐ Step 7 – Install whatever you would like (that is conductive, of course) in between the two pads for the KEY. This can be two pieces of wire you touch together to make it beep, two wires going to a mono jack (not supplied) so you can actually plug a morse code key in, or just short the pads together to make it ring the entire time the unit is powered on. Annoy your friends, significant other, and pets. Life is good.
- ☐ Step 8 – Install 9V battery snap ensuring that the red wire corresponds with (+) and the black wire corresponds with (-). You do not want to reverse the leads. It is the equivalent of the Ghostbusters crossing the streams (actually it will just fry the 555 timer). **CAUTION! BATT is UNLABELED on the circuit board due to poor attention span prior to submitting the design to be manufacturer.** This component is immediately to the left of the PWR header. Reference the artist's rendition for what BATT should look like.



- Step 9 – Install Piezo element. Again, reference below image for proper placement of this component as it has succumbed to the same incompetence in quality assurance. You may strip the leads as short as you like, but recognize they are very thin gauge wire and not rugged. Also, the leads may be installed in either direction (no polarization). We've found that the best way is to install them short enough so they don't get snagged and ripped off. Also ensure that the element is not touching anything as it will detune and keep from ringing properly or worse, create a short in the circuit.



Operation

After all of that verbosity, there's not a whole lot to it. Whenever the jumper is across the PWR pins, the circuit will be on (assuming you've actually attached a 9V battery). To make the unit sound, just short whatever you have hooked up to the KEY position. If you hook up a speaker instead of the piezo element, you may populate R4 with a fixed value resistor to limit the volume, or a rheostat (or potentiometer with a tied wiper) for variable volume control. If it catches on fire, please take pictures! We do hope this was fun, at the very least, and our presentation has inspired you to make your own dream a design reality!