

# CORNERSTONE HAM RADIO FLEX CLUB

## SOLDERING PART THREE -- Onboard Microphone

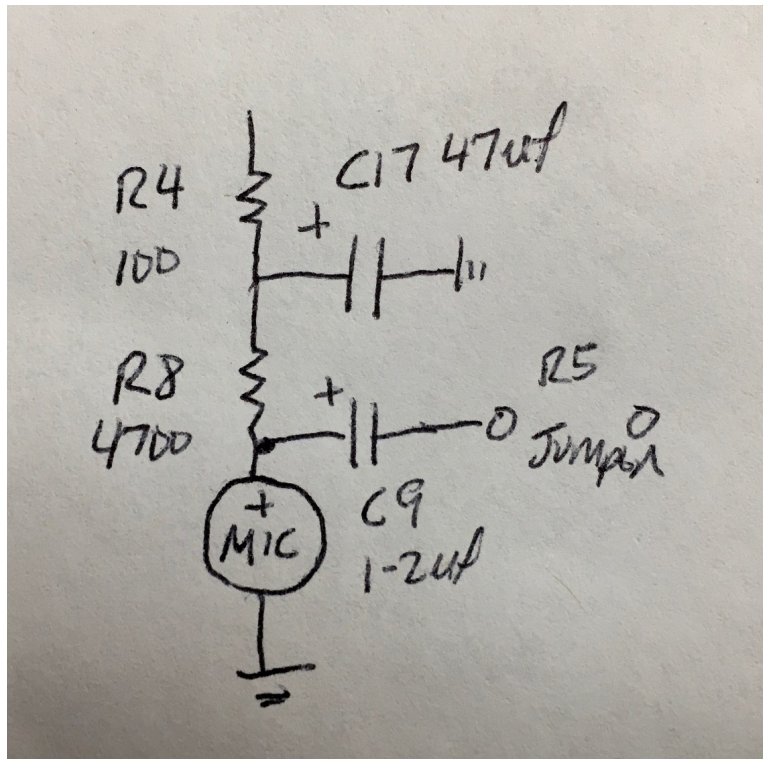
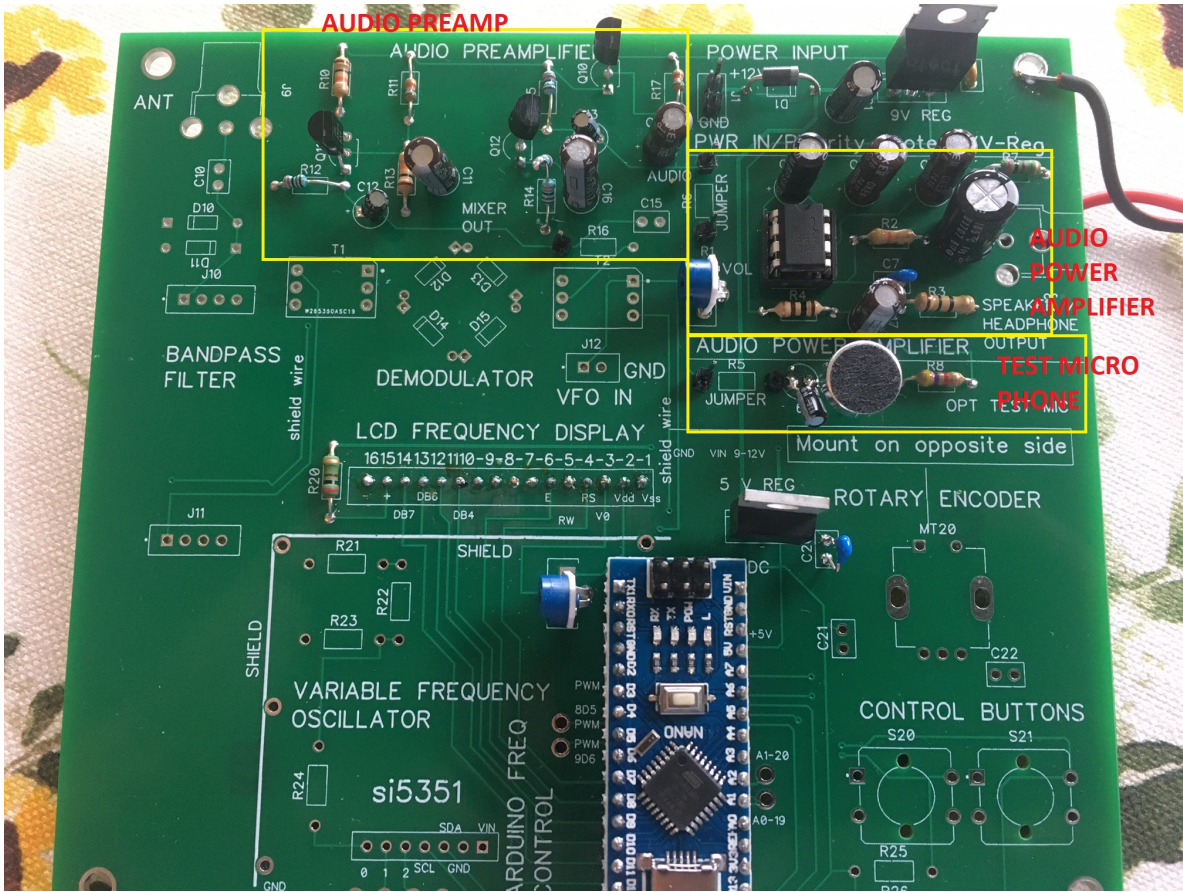
### SECTIONS TO BE SOLDERED / CONSTRUCTED

No.	Section
1	9VDC Power Supply
2	5VDC Power Supply
3	Audio Power Amplifier
<b>4</b>	<b>Test Microphone</b>
5	Audio Preamplifier
6	Wind trifilar transformers
7	Balanced (de)modulator
8	Arduino computer controlled variable frequency oscillator / display / controls

#### CIRCUIT:

**Onboard Microphone.** The board includes an onboard microphone connected to some header pins that allow you to route its output to the input of either the final audio amplifier (23dB gain) or to the input of the audio preamplifier -- allowing you to test your radio.

The electret microphone is built with a bit of non-conductive resin with an embedded charge between the sides, created by the manufacturer. As your voice moves a portion of the physical device closer or farther away from this charge, the voltage of the capacitor that it physically creates, will change. The device includes an onboard field effect transistor to amplify and isolate this voltage to create a usable output voltage. In order to use it, you must provide it with a low voltage power supply through a resistor between 2 and 10kOhms (R8 in our circuit), and then the AC voice output can be picked off and sent through a capacitor (C8) for amplification. R3 and C17 provide dc power filtering just as you've seen several times before in this design.



- ❑ Solder in a 100- or 200-ohm resistor for R3, and a 47uF capacitor for C17, paying careful attention to the polarity of the capacitor.
- ❑ Solder in a 4700 ohm resistor for R8
- ❑ Solder in a 1- or 2-uF capacitor for the dc-blocking, audio-passing capacitor C8. The plus side of this capacitor goes toward the MIC
- ❑ Solder in the electret mic. Look carefully on the back, and you can see that one of the solder tabs has traces that connect to the CASE. That side should be soldered to ground; the other side (that does NOT connect to the case) goes to the (+) side of the MIC.
- ❑ Solder in a single "pin" at each of the ends of phantom resistor R5. This isn't there for a real resistor, but instead to allow you to put in a pin at each end. Solder the short side of the pin, and leave the long side sticking up. Later you can use the pin closest to C8 to allow you to route the microphone output toward an audio input.
- ❑ Solder in a single "pin" at each end of the "jumper" R6 if this hasn't already been done.

The pins at "R6" allow you to use dupont connector wires to route the microphone output to the input of the audio final amplifier, or to the input of the preamplifier.

### **TO TEST YOUR AUDIO POWER AMPLIFIER WITH THE MICROPHONE:**

- ❑ Using "dupont wire" with black plastic sockets at each end, connect left and right pins of the jumper "R5" -- this is wired so that it sends the output of the microphone to the top side of the volume control variable potentiometer R1.
- ❑ You will probably have to turn the potentiometer fully counter clock-wise (CCW) because the gain of the audio amplifier by itself (voltage gain = 200X) isn't that great--but if you connect a small speaker or headphone set to the output of the amplifier, you should get some sounds out of the speaker when the system powered and you stroke the microphone with your finger, or speak loudly into it.