Yukon Amateur Radio Association
Pixie Workshop, Lesson 3 -
The Audio Amplifier and associated parts

At this point there are still quite a few parts still to be installed in your transceiver. Today you will finish putting them in place.

The parts to be installed are R3, R6, R7, R8, W1, C4, C8, C10, C11, CP2, CP3, CP4, D3, D4, J2, J3, J4, and J5, the buzzer, the socket for the LM386 integrated circuit and finally, the integrated circuit itself.

Construction:

Once the larger parts are installed it can be difficult to install some of the smaller ones so the outline below begins with the smaller parts, in particular, the resistors.

1. Install R3, a 1 k ohm resistor.

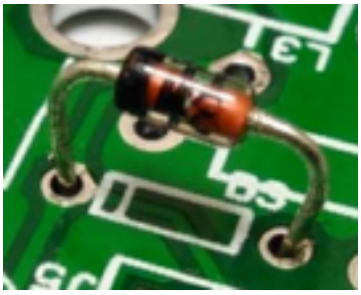
2. Install R6, a 100 k ohm resistor.

3. Install R7, a 10 ohm resistor.

4. Finally, install R8, a 10 k ohm resistor. At this point you will probably find that you have some resistors left over. Resistors are very inexpensive and the kit makers seem to have provided more than needed.

5. The small capacitors will be installed next, beginning with C4, a 10 nF (103) capacitor.

6. Install C8, another 10 nF capacitor.



7. Install C10, a 0.1µF capacitor (104).

8. Install C11, a 10 nF capacitor (103).

9. Install the 1N4148 diode D3. As for the other diodes, it matters how this one is installed. The black band at one end of the diode must be oriented in the same position as the band on the circuit board.

10. The LED (light emitting diode) D4 can be installed now too. If you look carefully you will see that one lead is longer than the other. This lead goes in the hold marked with a small + sign. Also, if you look carefully, you will see that there is a small flat on one side of the LED. When the LED is correctly inserted it should match the flat on the circuit board marking. Just insert the LED to the bumps in its leads and then solder. Cut off the excess leads below, flush with the circuit board.

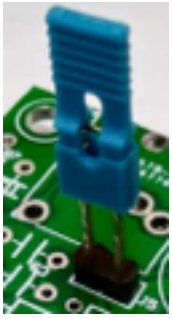
11. Install the 10 µF electrolytic capacitors CP2, CP3, and CP4. Remember that it matters how these are oriented too; the side marked with a - goes in the hole surrounded by hatched markings on the circuit board.

12. Now install the socket for the integrated circuit. Again, look carefully and you will see a small notch in the centre of one end of this socket. This notch should be lined up with the notch marking on the circuit board. Insert the socket and make sure it is flat to the board. Then solder all 8 pins, starting with pins that are diagonally opposite - just to help make sure that the socket is flush to the board.

13. Install the jacks J3 and J4 for the headphones and key. Both jacks are the same so it doesn't which one goes where, but of course it matters that each lead is properly inserted in the appropriate holes and soldered in place with the jacks flush to the board.

14. Install the antenna jack. Make sure all the leads are properly in the circuit board holds and that the jack is flush to the board before soldering.

15. Install J5. If you place the jumper cap onto J5 you will find it easier to hold as you solder this component to the circuit board. Solder quickly though, so as not to melt the plastic of the jumper cap.



16. Install the buzzer. It has a small + sign on the top. The lead beneath this goes into the hole marked +.

17. Install the variable resistor W1 into the circuit board. There are 3 electrical connections and two tabs that need to be soldered. The tabs just hold the variable resistor securely in place. Be sure the component is flush to the board before, and as, you solder.

18 The final step is to install the integrated circuit. Look at it carefully. There is a small notch in its top at the centre of one end. This notch matches that of the socket and, if everything has been done correctly, the notch should be towards the electrolytic capacitor CP2. Line up the pins carefully and insert the integrated circuit into the socket.

At this point you can assemble the case too. Remove all the paper covering from the plastic pieces. Assembly is pretty straightforward.

Testing:

1. Insert one lead of a 51 ohm resistor into the centre of the antenna jack and fasten the other lead to the metal outer section of the jack with a piece of tape. Make this connection as secure as you can.

2. Connect headphones and a key to the transceiver.

3. Connect power to the transceiver. You should hear a hissing noise in the headphones.

As you do the following tests, DO NOT LEAVE THE KEY PRESSED FOR TOO LONG i.e. more than about 10 to 15 seconds or you risk overheating the transistor Q2.

4. Adjust a receiver to about 7.023 MHz. You should be able to hear the Pixie's oscillator. Now press the key. LED diode D4 should light up and the buzzer should sound. Also you should find that the frequency heard by the receiver shifts slightly. Readjust the receiver frequency to this new frequency. Is the signal strength greater than before?

5. Try adjusting the variable resistor W1 while the key is pressed. Does the frequency change?